

# Testing the Hierarchical Model of Intrinsic and Extrinsic Motivation at the Situational Level.

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## **Abstract**

Motivation is defined as the direction, intensity and persistence of an individual's participation in an activity (Heckert et al. 2000; Locke and Latham 2002; Moreira et al. 2002). Motivation is vital for performance and encompasses a range of processes and desires (Maslow 1970; Beck 1983; Wentzel 1999). These desires stimulate an action or behaviour, caused and directed by motives where the individual identifies and prioritises goals to be achieved (Deci and Ryan 2000, 2008; Roberts et al. 2004). Motivation experienced at a given moment in time for a specific activity is termed situational motivation (Vallerand 2000) and has not been as thoroughly investigated as contextual level motivation (LaChausse 2006). Traditionally motivation theories have lacked an appropriate framework for addressing the complex processes of situational motivation (Nygård 1981; Veermans and Tapola 2004). However the hierarchical model of intrinsic and extrinsic motivation (HMIEM; Vallerand 2000) extended self-determination theory (SDT) and suggests specific processes for a situational level of motivation as well as for contextual and global motivational processes (Vallerand 2000). The HMIEM shows affect, behaviour and cognition as a consequence of motivation similarly at all three levels of generality. Although it may be that, at the situational level, affect plays a more significant role as an antecedent which is not necessarily mirrored at the contextual or global levels of the HMIEM (Linnenbrink and Pintrich 2002; Hardy and Gustavo 2005; Barnett 2006). The aims of this thesis are to identify factors relating to situational motivation; to assess changes in situational motivation and to investigate the processes of situational motivation during activity.

The first study investigated motivation between different sports personality types using a cross sectional design. Participants ( $n=239$ ), who regularly participated in sports sessions, completed the Sport Motivation Scale (SMS; Pelletier et al. 1995) and an adapted Eysenck Personality Inventory (EPI; Eysenck and Eysenck 1964). Results showed that extroverted athletes reported significantly higher intrinsic motivation (IM) than introverted athletes ( $p = .006$ ) more specifically this was IM-to accomplish ( $p = .029$ ) and IM-to experience stimulation ( $p = .001$ ). Athletes high in neuroticism showed significantly more amotivation than their more stable counterparts ( $p = .001$ ). The findings suggest that some sports participants can experience neuroticism which is also related to high levels of amotivation. Extroverted athletes may focus on utilising both intrinsic and extrinsic motives, in line with Roberts et al. (2004), resulting in higher levels of overall motivation for this study. Introverted athletes showed less intrinsic motivation than expected which may demonstrate a conflict between the internal focus of the introvert and the extrinsic nature of sport as discussed by Hong and O'Neil (2001) and Pushkar et al. (2002).

To explore changes in situational motivation over a short period of time, study two employed a two-way between-within subject design. Experienced and less experienced Pilates participants ( $n=54$ ) completed pre- and post-session Situational Motivation Scales (Guay et al. 2000), the Worcester Affect Scale (WAS; Rhoden and West 2010) and goal achievement information over 4 weeks. Unexpectedly, there were no significant differences between experienced and beginners' levels of intrinsic or extrinsic motivation for Pilates. Both experienced participants and less experienced participants reported significant increases in IM over time ( $p = .010$ ). There were increases in the percentage of participants across both groups who recorded pre-session goals, in week 1, thirteen participants reported positive goal achievement but did not report a pre-session goal. There were significant increases in positive affect (PA,  $p = .001$ ) pre- to post-session and decreases in negative affect (NA  $p = .004$ ) pre- to post-session for both experienced and less experienced groups. Optimal situational motivation for unfamiliar situations may require a more structured environment where specific information is delivered, and/or a secure environment where individuals can explore their responses. Increased IM may be due to the non-competitive nature of Pilates, although the positive effects of goal achievement may feed into future IM for the remaining sessions through the internalisation process (Standage et al. 2008).

The processes of situational motivation were examined in study three by monitoring goal progression and affect during cycle time-trial performance. Seven well-trained cyclists performed two laboratory time trials on a kingcycle ergometer on two separate occasions. Situational motivation (SIMS; Guay et al. 2000), affect (WAS; Rhoden and West 2010) and goal data were collected pre- and post trial using previously validated measures and open questions. Affect and goal achievement were also collected throughout the trial using likert scale measures. Data were analysed individually and single case responses show 5 participants reported an increase in intrinsic motivation after riding their fast trial. Participants also differed in their perceptions of success, P1 rated both trials as successful even though their slowest trial was 83 seconds slower possibly due to achieving their pre-trial goal. Those who perceived themselves as successful also report higher confidence to achieve their goal (GC) from 15 km until the end of the trial. Positive affect during the fast trials was significantly higher than for the slow trials from the start ( $p = .001$ ) and NA was significantly lower for the first trials also from the start of the trial ( $p = .001$ ). The lack of change in situational motivation pre- to post-trial suggests that the hierarchical model demonstrates contextual and global motivation but does not represent situational motivation processes accurately. Feelings of satisfaction, associated with intrinsic motivation, can take time to assimilate into an overall motivational orientation (Lonsdale et al. 2009). However, despite no immediate motivational change, affect

significantly differed from the start of the perceived successful trials, suggesting that at the situational level, affect is an important construct during time-trial performance. Thus perceived goal progress and affect may be better indicators of situational motivation than more general orientations of intrinsic and extrinsic motivation.

Study four further examined the processes of situational motivation including affect and goal progress, through direct competition during a badminton tournament. Participants ( $n=16$ ) were county level badminton players in a mixed doubles tournament who completed a number of motivational (SIMS; Guay et al. 2000), goal and affect (WAS; Rhoden and West 2010) measures between games and matches throughout a tournament. Part way through the tournament, intrinsic and extrinsic motivation differed significantly between successful (top 4 finishers) and unsuccessful (bottom 4 finishers) players ( $p=.028$ ). Whilst negative affect ( $p=.029$ ), goal confidence ( $p=.028$ ) and goal discrepancy ( $p=.028$ ) changed significantly straight after the first game was played. These findings do not lend support for the hierarchical model which assumes that affect, behaviour and cognition are only consequences of situational motivation (Gillet et al. 2009). Taken together, the findings from the studies in this thesis suggest that there are important self-regulatory processes such as goal confidence, goal setting, and affect which may operate in a cyclical manner. These factors may have an influence on the processes of situational motivation which may be different from that suggested with the HMIEM.

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## ***Declaration***

I declare that this thesis is a presentation of my own original research work and all the written work and investigations are entirely my own. Wherever contributions of others are involved, this is clearly acknowledged and referenced.

I declare that no portion of the work referred to in this thesis has been submitted for another degree or qualification of any comparable award at this or any other university or other institution of learning.

**Signed:**

**Date:**

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## 1.0 Introduction

Motivation is important in initiating activity through the process of identifying and prioritising an individual's goals, needs or desires. Motivation in its most general terms is defined as the direction, intensity and persistence of an individual's participation in an activity (Heckert et al. 2000; Locke and Latham 2002; Moreira et al. 2002). The directional component suggests that the individual has some choice about what to focus their motivation on, which activities to select and whether they are striving to achieve an outcome or avoid the negative results of an outcome. The exercise literature finds that persistence at an activity over longer periods of time is related to high levels of intrinsic motivation (Jõesaar et al. 2011). The intensity aspect of motivation infers that the amount of effort an individual directs towards an activity, and the more an individual is motivated, the more effort they expend in carrying out that activity (Brehm and Self 1989).

In the researchers experience coaching at an elite level, personal and anecdotal discussions with elite international athletes participating in a team sports environment revealed that some individuals routinely prepare for a training session, to the point of starting their journey to the venue. However, during their journey they have turned around and headed back home for no other reason than they just "*did not feel like going*". Further exploration of these situations did not uncover any adverse incidents during the journey or other time prior to training which could provoke such a response. These individuals have then stated that they attended the following training session as normal and that they are still highly motivated to train for and achieve within their sport. Other elite athletes admit to attending training sessions where some days, players are willing to work hard in training and put in lots of effort using feedback positively and actively trying to improve their performance. However, some days the same players take all feedback as personal criticism, are not perceived to put in an appropriate level of effort, and are easily distracted. Again in future sessions their intensity of training returns to their previously high levels. Some of these athletes have implied this is due to a dislike of a specific training activity, yet others cannot articulate reasons why this happens.

During competitive performance there are surges in play where teams score more freely towards the end of each half or quarter despite decreasing performance effort part way through the game (Reilly 1997; Borrie et al. 2002). It is unlikely that an individual is able to sustain maximal effort towards an activity all of the time (Brehm and Self 1989). However, with an increased

reliance on the underpinning sports science knowledge supporting coaches and athletes at international level, it can be assumed that an international athlete undertakes suitable training regimes for their activity, that they have adequate rest and recovery and achieve an appropriate nutritional and hydration status (Reilly et al. 2009). If this is the case, then there must be other reasons as to why performance, and occasionally attendance, at training and competitions is inconsistent.

There is a plethora of research which suggests anxiety as a major factor in competitive performance (Woodman and Hardy 2003). However, anxiety theory does not always explain attendance and performance at training; a familiar situation to the athlete which does not place additional and uncontrollable external outcome pressures on the athlete. Over time, individuals are thought to become more accustomed to their sporting activity and the activity as a stimulus may lose its ability to arouse attention, excitement and interest in the individual (McMullin and Steffen 1982). Thus the individual may seek out situations within the activity, which lead to an increase in stimulation (Meeusen et al. 2006) or they may lose interest in the activity and reduce their participation (Fraser-Thomas et al. 2008). The processes discussed above can be explained through motivational theory which suggests that individuals develop drives and desires to attain a future target or state and this in turn initiates action towards that activity (Vallerand 2000; Deci and Ryan 2008).

Motivational orientations are the preferences individuals show for intrinsic or extrinsic motivations which may develop gradually over time across repeated and similar experiences (Barnett 2006; Levesque et al. 2008; Lavigne et al. 2009). Self-determination theory (SDT; Deci and Ryan [2000, 2008], which is discussed below) demonstrates a number of constructs which relate to both intrinsic and extrinsic motivation and it is using these orientations which help individuals shape their preferences for demonstrating effort and performance within an activity. For example, individuals see intrinsic motivational orientations in terms of interest in and enjoyment of the activity along with some element of choice in selecting the activity and resulting behaviour within the activity (Friedman et al. 2010). An extrinsic orientation can encompass feelings of boredom and alienation from the activity as well as perceptions of pressure to behave in a certain manner central to the activity (Friedman et al. 2010). Goal orientations differ in that they are representational goal strivings which take into consideration both the motivational orientation of the individual but are also shaped by the situational constraints and demands not least by the perception of motivational climate, the instructor, leader or coach's motivational focus (Kavussanu and Roberts 1996; Gernigon et al. 2004;

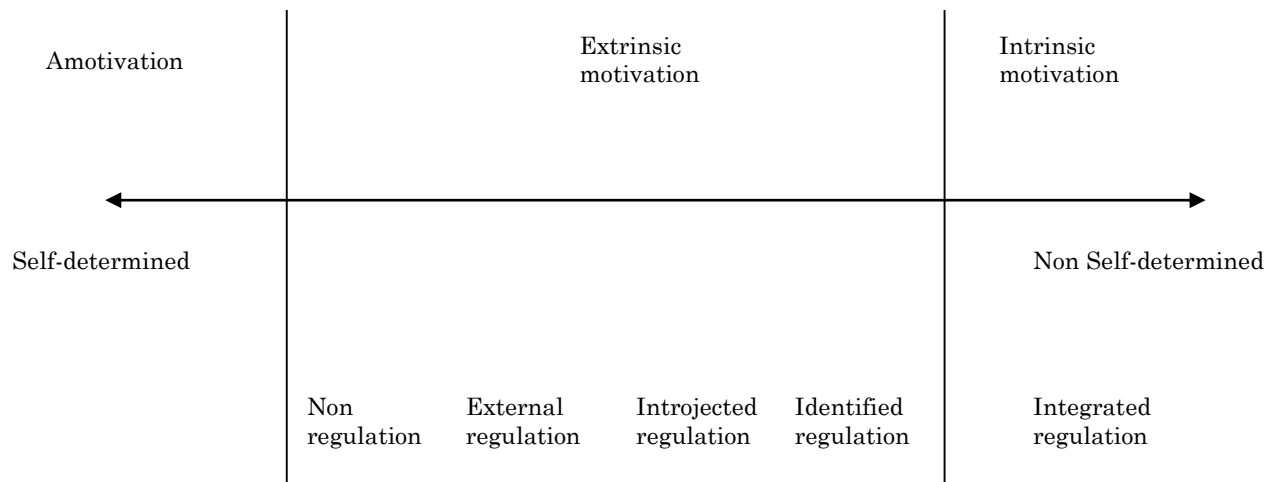


Wiersma and Sherman 2008). Goal orientations are normally classified into task, mastery and process orientations also by ego, performance and outcome orientations (Kilpatrick et al. 2003; Beaudoin 2006; Smith et al. 2006). Whilst both motivational and goal orientations have been separately identified and defined, the general consensus within motivational literature is that individuals will usually demonstrate combinations of intrinsic and extrinsic motivational orientations leading to combinations of task and ego goal orientations (Steinberg et al. 2000; Hein and Hagger 2007). Additionally, combinations of tasks and ego goal orientations will enable individuals to manage their goals in environments where one component of motivational and goal orientations is absent (Steinberg et al. 2001).

Motivation literature has focused largely on motivational orientations within a contextual, broader perspective of general sports performance (Frederick and Ryan 1993; Maltby and Day 2001; Roberts et al. 2004; LaChausse 2006) resulting in key motivational theories within sport and exercise including self-determination theory (SDT; Deci and Ryan 2008), goal achievement theory (Nicholls 1984) and need achievement theory (Atkinson 1957). The main theoretical framework for this thesis will be SDT, as this theory, extended through the hierarchical model of intrinsic and extrinsic motivation (HMIEM; Vallerand 2000), identifies a situational level of motivation. The SDT also includes perceptions of self-determined and controlling factors which can affect performance behaviour (Bartholomew et al. 2009). Situational motivation is defined as motivation experienced at a given moment in time for a specific activity and is represented at the lowest level in the HMIEM (Wilson et al. 2002; Lavigne et al. 2009). It is the most temporally and contextually specific level of motivation (Conroy et al. 2006) which will influence immediate performance (Linnenbrink and Pintrich 2002). The processes involved in situational motivation are dynamic and less stable occurring rapidly across and between specific situations (Covassin and Pero 2004) at a moment-by-moment level (Guay et al. 2000; Turnbull and Wolfson 2002).

One of the key concepts for SDT is the satisfaction of three basic psychological needs which are autonomy, competence and relatedness (Deci and Ryan 2008). The identification and the process of striving to fulfil these needs can affect the individual's perception of themselves: (Ntoumanis 2001; Niemiec et al. 2008). The concept of autonomy suggests that individuals perceive choice in the direction and intensity of their motivation (Sheldon and Filak 2008; LaGuardia 2009). Competence relates to perceived effectiveness of their ability (Faye and Sharpe 2008; Sheldon and Filak 2008). Although, LaGuardia (2009) suggests that individuals do not have to rely on success but merely the fact they are engaging in the activity in order to

satisfy competency needs is enough. Relatedness refers to satisfying social relationships and meaningful interaction with others (Faye and Sharpe 2008; Sheldon and Filak 2008). Relatedness is also about being perceived as significant in the eyes of others (LaGuardia 2009). During the process of satisfying these basic psychological needs, the individual will rely on different types of motivation which are recognised through SDT. These types of motivation are represented along a continuum from self-determined forms of intrinsic motivation to non-self-determined forms of motivation such as amotivation according to SDT (see figure 1).



**Figure 1.0** Self-determination continuum (Deci and Ryan 2000: p.237).

There are three main types of motivation recognised within SDT; namely intrinsic motivation, extrinsic motivation and amotivation. Intrinsic motivation is related to experiencing enjoyment and satisfaction when participating in activity and SDT recognises three regulations within intrinsic motivation: to know; to accomplish things; and to experience stimulation (Markland and Tobin 2004; Faye and Sharpe 2008; Niemiec et al. 2008; Lonsdale et al. 2009). Intrinsic motivation to know is related to feelings of pleasure when trying to explore or understand something new out of curiosity (Barkoukis et al. 2008; Gillet et al. 2009). Intrinsic motivation to accomplish things suggests that individuals participate in order to challenge themselves (Gillet et al. 2009) but the focus is on the process of that accomplishment rather than the outcome (Barkoukis et al. 2008). Intrinsic motivation to experience stimulation refers to the experience of pleasant and positive sensations which can be felt when participating in the activity (Barkoukis et al. 2008; Gillet et al. 2009). However, Sheldon and Filak (2008) suggest that threats, observation, deadlines and competition can serve to undermine intrinsic motivation and thus self-determination.

Extrinsic motivation consists of more specific motivational regulations which are generally less self-determined than intrinsic motivation (Vallerand and Bissonnette 1992). However, integrated regulation suggests that previously external motives have been effectively assimilated into the individuals self-beliefs as part of an internalisation process and is the most self-determined form of extrinsic motivation (Markland and Tobin 2004; Faye and Sharpe 2008; Levesque et al. 2008). Integration refers to behaviours which are performed out of choice and bring harmony and coherence to values, beliefs and ideals which serve the self-concept (Levesque et al. 2008; Lonsdale et al. 2009). However, the individual performs for the achievement of goals and not for the inherent satisfaction of the activity which differentiates intrinsic from extrinsic motivation (Ntoumanis 2001). Identified regulation suggests that individuals have made a decision to accept that the behaviour is important in achieving outcomes which are valuable to their sense of self (Koestner et al. 1996; Reeve et al. 2002; Barkoukis et al. 2008; Assor et al. 2009). Although they engage in the activity of their own volition, they may not find the activity attractive, such as practice and training, but perceive it as the best way to develop themselves (Vallerand and Bissonnette 1992; Barkoukis et al. 2008; Gillet et al. 2009). Introjected regulation is classified by the internalisation of previously external motives and these manifest through a perceived pressure to avoid feelings of guilt and shame (Vallerand and Bissonnette 1992; Koestner et al. 1996; Markland and Tobin 2004; Levesque et al. 2008) or to enhance feelings of self-worth (Niemic et al. 2008; Assor et al. 2009; Lonsdale et al. 2009). External regulation is the least self-determined form of extrinsic motivation, and is seen as involvement in activity for the sake of achieving external rewards or avoiding pressures (Markland and Tobin 2004; Faye and Sharpe 2008; Gillet et al. 2009).

Amotivation is described as a lack of intention to engage in behaviour and is regarded as an absence of self-determined motivation (Deci and Ryan 2008; Levesque et al. 2008; Ullrich-French and Cox 2009). Amotivated regulation may occur as a result of misperception surrounding behaviour and potential outcomes such that the behaviour is not valued or the individual perceives a lack of competence (Ryan and Deci 2000; Markland and Tobin 2004; Edmunds et al. 2008; Gillet et al. 2009). This amotivated behaviour can also be classified into four types: the belief about the lack of perceived ability for the activity; the belief that the strategy used will not achieve the outcomes; the belief that the activity will be too demanding; and the belief that the investment of effort would still be unsuccessful in achieving the task or activity (Barkoukis et al. 2008). As such, amotivation has been likened to learned helplessness which is linked to perceived incompetence and reduced controllability of the situation (Barkoukis et al. 2008). In an amotivated state, the individual may feel as though they are just

going through the motions with no real sense of purpose (Vallerand and Bissonnette 1992; Lonsdale et al. 2009). Amotivation along with external regulation have been associated with maladaptive strategies for coping even though immediate performance may have been considered successful (Barkoukis et al. 2008).

Personality traits are thought to control and direct behaviour enabling the behavioural response to be extremely flexible responding to the individual and the situation (Steyer et al. 1999; Elliot and Thrash 2002; Baird et al. 2006). Furthermore, Barnett (2006) suggests that personality and situational differences are the most important factors in influencing motivation. When investigating activity selection Barnett (2006) found that 61%-87% of the variance was explained by personality, affect and motivation. Situational motivation may well determine effort within an activity; however, there will be instances where situational demands override the individual personality factors altering short term goals and drives (Shoda et al. 1993) and the corresponding situational motivation. Although goal orientations are thought to remain relatively stable throughout childhood and older age, they can still be influenced by various situations and may change the nature of personality traits across time (Steinberg et al. 2001). Thus individuals should not necessarily be classified according to one motivational orientation as there may be different responses across both personality and situational influence (Rose et al. 2001). As an individual matures, their self-identity also changes in line with their values, goals, personality traits and emotions and these become more central to the perceived self-image (Hardy and Gustavo 2005). Over time, this process may result in feelings of autonomy and is crucial in mediating the motivation to act in accordance with beliefs (Hardy and Gustavo 2005).

Motivation has also been related to pleasure and displeasure (Linnenbrink and Pintrich 2002; Westenhoefer et al. 2004) which are descriptors of positive and negative affect (Ekkekakis et al. 2011). Positive affect leads to increased effort and negative affect is aligned with helpless behaviours (Robins and Pals 2002; Covassin and Pero 2004; Mallet 2005; Pierro et al. 2006). According to the HMIEM, situational motivation results in affective, cognitive and behavioural responses (Vallerand 2000; Deci and Ryan 2008). However, Wentzel (1999) found that where individuals were in a state of emotional distress, their affect altered their motivation and ultimately changed performance. Affect may also be influenced by situational demands which can change an individual's perception of motivational climate and change perceptions of their own motivational focus (Linnenbrink and Pintrich 2002; Barnett 2006; Lam and Law 2007) and intensity (Westenhoefer et al. 2004). Covassin and Pero (2004) found that after competition, performance outcomes, residual arousal arising from performance and final motivation states

could affect future performance and intentions. If an individual's level of affect can influence perceptions of motivation and perceived demands, then it is possible that at the situational level, the end of one moment could act as the immediate precursor to the next in a cyclical process. Furthermore, the situational process has been identified as a moment-by-moment approach and it is this process that this PhD thesis aims to clarify.

Enhancing understanding of the processes and nature of situational motivation will be beneficial to athletes and coaches at all levels of performance and not just at an elite level. In order for an individual to demonstrate performance improvements and progress towards increased competency, they need to have undertaken a large amount of deliberate practice for which they would need high and consistent levels of motivation (Ericsson et al. 1993). As motivation is crucial in directing drive and effort towards an activity, the coach can create an appropriate environment in which to encourage and enhance the athlete's behaviour and effort within a session (Reinboth and Duda 2004). Furthermore, as the athlete becomes more aware of the motives and processes which drive their actions at the situational level of generality, they may have more control over the intensity, direction and persistence of their performances (Hardy et al. 2009). As situational motivation has been found to influence contextual and then global motivation over time (Lavigne et al. 2009), enhancing awareness of specific processes at the situational level of motivation will also impact long term motivation, effort and performance.

## **1.1 Aims**

The main aims of this thesis are: 1) to identify factors relating to situational motivation; 2) to assess changes in situational motivation; and 3) to investigate the processes of situational motivation during activity. Through the achievement of these aims this thesis purports to represent the influential factors of situational motivation in the HMIEM. Based on the discussion above, this thesis will include aspects of personality and affect as they relate to situational motivation. The ensuing literature review will consider processes of situational motivation from an SDT perspective and include personality theory as it relates to situational motivation. Theories of affect and the implications this has on immediate performance will also be included in relation to situational motivation.

## **2.0 Literature Review**

This section aims to explore previous literature and findings related to motivation. Within the area of sport and exercise, researchers have utilised and developed a number of key motivational theories. These will be introduced and discussed briefly to provide a complete picture of the understanding of motivation within sport and exercise activities. The drive theory, goal achievement theory and need achievement theories are important in providing a full theoretical framework and further enhancing understanding across the broad context of motivation within sport and exercise. However, SDT as extended through the HMIEM, includes a situational concept of motivation. Therefore, SDT will be explored and discussed in detail as the main theoretical framework for this thesis. As situational motivation interacts with contextual and global motivation and occurs in a moment-by-moment capacity, other factors will also be investigated which are considered through the literature as important influences on situational motivation.

### **2.1 Motivation**

Motivation is vital for performance and encompasses a range of processes (Beck 1983; Wentzel 1999). Maslow (1970) suggests that human beings are rarely satisfied for any length of time because when one desire is realised, another equally demanding desire, takes its place. These desires stimulate an action or behaviour caused and directed by motives where the individual identifies and prioritises goals to be achieved (Frost 1971; Roberts et al. 2004; Deci and Ryan 2000; 2008). Theorists, such as Freud, suggest that an overall goal for all behaviour is to obtain pleasure or avoid unpleasantness (Beck 1983; Shill 2004). This incorporates both drive reduction and drive increasing tendencies where behavioural inhibition seeks to reduce arousal and drive towards a goal and behavioural activation encourages goal progress and achievement (Schneller and Garske 1976; Wrisberg 1994; Ewen 2010). Although some drives are purported to be physiologically based and less self-determined, there is an element of intentionality to perform a behaviour, particularly in selecting activities with desirable outcomes over those expected to have unpleasant or aversive outcomes (Beck 1983; Koltko-Rivera 2006).

### **2.2 Motivational theories**

#### **2.2.1 Drive theory**

Exactly what level of motivational intensity or arousal is required for optimum performance in achieving a goal is unclear as a predictive factor and is only more closely ascertained by the

athlete and coach upon reflection. Much of our current understanding of the intensity aspect of motivation is still based around the drive theory hypothesis (Hull 1931). This suggests that in order to maintain homeostasis, behaviour is directed towards satisfying needs as they arise. The individual shows an increase in their level of arousal or drive and this reflects a corresponding increase in performance or behaviour up to the point at which the need has been satisfied or a habit has been formed, and therefore subsequently requiring less drive directed towards the goal (Hull 1931). Developing current understanding of basic drive theory, Kerr and Cox (1991) suggest that reversal theory better encompasses the effects of individual differences within general arousal theory. Reversal theory suggests that at low and high levels of arousal, the individual may interpret the experience differently depending on their metamotivational states and telic dominance (Kerr 1997). For example, at high levels of arousal the individual may experience the same situation in a state of excitement (paratelic state) or fear (telic state) (Apter, 2001). These levels of arousal are influenced by the type and difficulty of identified goal directed behaviour. Where goals are focused more on competency, resulting levels of arousal may be more manageable than goals focussed on beating another's performance as there is an unpredictable and uncontrollable aspect which may quickly elevate arousal levels ultimately affecting performance.

There are a number of key factors which suggest that drive theory is not particularly well suited to further developing an understanding of situational motivation. Firstly, drive theory relies on arousal and can only really be anchored through the extremes of low arousal or high arousal. These extremes are generally interpreted after performance has occurred, where good performance is linked with optimal arousal levels and poor performance with extremely high or extremely low arousal levels. Reversal theory provides further explanation of how an individual may interpret their arousal levels but is again reliant on performance outcomes to determine optimal levels. Arousal is a difficult concept to measure as it is linked to heart rate and galvanic skin response which changes in relation to increased exercise intensity and may provide unreliable indicators of arousal. The difficulties of measuring such a concept are discussed further in the measurement section of this literature review.

### **2.2.2 Goal achievement theory**

Actions are thought to be goal directed therefore if an individual identifies specific goals prior to an activity, this would enable an assessment of arousal levels required for goal achievement prior to the activity thus preparing the individual for performance. Goal achievement theory

suggests two main types of goals (Nicholls 1984). Task orientated goals (also labelled process and mastery) relate to a concept where the individual focuses on the learning aspect of the goal and are generally self-referenced (Cury et al. 2003). There is an emphasis on increased effort to achieve higher levels of ability (Biddle et al. 2003; Hein and Hagger 2007). Ego orientated goals (also known as outcome and performance) are normatively referenced and the outcome of the action is perceived as high or low competency compared to others' performance (Cury et al. 2003; Kilpatrick et al. 2003). For an individual high in ego orientation, increased effort may not lead to achievement as effort alone may not be enough to compete successfully with others (Hein and Hagger 2007). Task and ego goal orientations are found to be orthogonally independent and individuals can demonstrate high levels of both task and ego orientations (Steinberg et al. 2000). Whilst this may be due in part to increasing opportunities for success, the perception of success may depend largely on the situation and climate in which the goal sits (Kavussanu 2006; Vansteenkiste et al. 2006). The focus of behaviour is thought to be goal directed towards attaining the intended goal, however, evidence also suggests that an individual can be motivated to avoid the unpleasant consequences of failing to achieve goals, although these would be more extrinsically focused and this is covered more specifically in need achievement theory (Conroy et al. 2006).

Goal achievement theory enables the individual to identify what type of motivation they are striving for or have relied on during performance. From a more situational approach, research into motivational climate shows that where a task or ego orientated climate is perceived, individuals will be more likely to set goals related to that climate regardless of whether that is their dominant motivational perspective (Papaioannou et al. 2007). If the perceived climate does not align with an individual's preferred motivational orientation they are less likely to direct maximum effort towards an activity (Ames and Archer 1988; Papaioannou et al. 2004). Goal achievement theory does not indicate how much motivation an individual is directing towards a particular activity but only the type of motivational orientation they are using or prefer to use.

### **2.2.3 Need achievement theory**

Need achievement theory is similar to goal achievement theory in that it identifies a predominant motivational orientation. There are thought to be two main motivational factors according to need achievement theory, namely the motive to achieve success and the motive to avoid failure. These are further categorised through the probabilities and the incentives for success and failure (Janman 1987; Covington and Mueller 2001). Motivation to achieve is



viewed as a function of the motive strength, the expectancy of goal attainment and the value of this as an incentive (Atkinson 1957). Furthermore, this theory suggests that optimal performance occurs where there is most uncertainty about the outcome regardless of approach or avoidance tendencies. If motivation to avoid failure is a dominant orientation, these individuals will prefer either safe activities or extremely difficult and speculative activities (Atkinson 1957). Individuals who are more orientated towards avoiding failure tend to rely less on internal motivational factors and their response to success is related to relief rather than pride (Covington and Mueller 2001).

Individuals who predominantly avoid failure are thought to develop an active fear of failure and intense effort can be directed to these avoidance strategies including lack of participation (Schmalt 2005). This avoidance orientation may also occur in situations where failure is more threatening to an individual than success (Stewart and Meyers 2004). Individuals with a dominant approach orientation are more positive about goal achievement (Covington and Mueller 2001). An approach perspective means that individuals strive towards attaining good performance and have a positive perception of competency (Covington and Mueller 2001; Cury et al. 2003), however, they are then likely to set more difficult performance goals for the future (Kaye et al. 2008). The most effective motivational strategy should include a combination of both approach and avoidance strategies as these are important in the self-regulation of motivation and in reducing instances of negative affect and self-defeating behaviours (Kaye et al. 2008).

Development of goal achievement theory and need achievement theory led to the initial proposal of a trichotomous model whereby ego orientation is divided into two perspectives; performance approach which seeks to attain desirable judgements of competence, and performance avoidance based on avoiding unfavourable judgements of normative competence (Cury et al. 2003). Additionally, more recent findings suggest that task orientations can also be divided into task approach and task avoidance tendencies thus supporting a 2 x 2 approach (Wang et al. 2007). These developments were identified through studies which examined the implications of goal content across different motivational orientations using an achievement goal questionnaire (Wang et al. 2007). Elliot (2006) discusses a hierarchical model of need achievement and recognises that goals are the most immediate precursor to behaviour and serve to both explain and predict behaviours. However, goals are not a discrete concept and the individual's underlying motivational orientations influence the types of goals set (Elliot 2006). Thus goals are the most dynamic and situational aspect of need achievement theory. In order to

assess how much effort would be directed towards an activity, goals set and priority of particular goals are necessary pieces of information, although this will still not measure the intensity of effort during an activity.

#### **2.2.4 Goal setting**

Goal setting is important in directing and initiating effort towards an activity and is probably the most important situational factor related to motivation. It guides an individual's action towards meeting an outcome for both goal achievement and need achievement theories. The goal setting process is initiated when an individual is dissatisfied with their current status or condition, generating a discrepancy between present situation and future valued outcomes (Locke and Latham 2006). For goal setting to be effective in altering performance, there are four main concepts for consideration. Firstly, i) challenging and specific goals are most effective in eliciting effort and persistence for a task; ii) goals direct and prioritise attention and effort towards specific tasks; iii) the outcomes of goals imply a task knowledge and skill base gained through the process; and iv) working towards goal achievement may enhance explicit awareness of previous knowledge and ability or drive the individual to search for new knowledge (Locke and Latham 2006; Latham and Locke 2007). Individuals can utilise and work towards more than one goal at any one time, including a combination of goal types set over long and short periods of time (Hall and Kerr 1997; Wentzel 1999; Covington 2000; Downie et al. 2006). In order to monitor progress towards goal achievement there needs to be an interaction between the internal process of actually doing the goal or task and the more extrinsic focus relating to goal progression and achievement (Gernigon et al. 2004; Pierro et al. 2006). Discrepancies between goals and current behaviours can act as powerful motivators for performance and are prominent in self-regulatory processes for performance over time (Kernan and Lord 1990; Donovan and Williams 2003).

Setting goals is part of a process for planning future behaviour and goals typically reflect the intentions of an individual to perform a specific task or achieve a certain level. However, merely stating goals does not lead directly to action unless there is also a strategy for how the individual will go about achieving that goal (Gallo et al. 2009). On its own a goal can be confounding as the individual has identified a target behaviour or performance and may not know what they have to do in order to achieve their goal. A strategy for action indicates more precisely what the next stage should be and how to go about it. Setting goals for each specific situation can help to direct effort and intensity of effort towards achieving that outcome and therefore, should be an

important part of the situational motivation process. Measuring situational motivation within this thesis will include collection of goal data for each activity and reporting goal achievement after completing the activity.

### **2.2.5 Theory of planned behaviour**

Similar to goal setting theory, an individual's behaviour can be predicted by the intention to perform that behaviour coupled with a perception of behavioural control. According to the theory of planned behaviour (Ajzen, 1991), the individual makes an assessment of their competence in performing that behaviour and plans a strategy to alter performance (Armitage and Conner 2001; Brickell et al. 2006). This theory encompasses the individual's attitudes towards the behaviour, external pressures to perform the behaviour and the perception of challenge in performing the behaviour (Ajzen 1991). The theory of planned behaviour suggests that the most important effect on behaviour is the intention to perform or act, which is then influenced by goal type and motivational orientation (Hamilton et al. 2012). However, Gallo et al. (2009) suggest that having an intention to perform but no plan for action means it is less likely that individuals will act. Thus it seems that planning for action, which links strongly to goal setting processes (Rhodes et al. 2006a), and the intention to perform are both important for behaviour to occur.

Often extrinsically focussed goals are not within the individual's ability to control their response to the demands of the situation and this can produce unrealistic outcome expectations. For example, a goal to score more in football depends on team mates passing the ball when the individual is in a goal scoring position or for the individual to move with the ball into a goal scoring position. It also relies on the opposition defence and goal keeper failing to adequately protect their goal. Where the individual is unsuccessful in attaining their goal to score more, perceived competency judgements can be affected thus negatively influencing motivation. However, setting goals on the processes which may help to achieve this outcome provide a sense of self-determination in directing and controlling their own performance criteria. The theory of planned behaviour extends goal setting theory to include an initial assessment of competence in an activity, coupled with a strategy for action. Both need achievement and goal achievement theories provide framework within which to set goals and plan behaviour. However, whilst these theories directly affect action they do not provide an assessment of intensity of effort towards an activity.

The main aims of this thesis are identifying factors related to situational motivation, assessing changes in situational motivation and investigating the processes of situational motivation. Motivational orientations, as depicted by goal and need achievement theories, have been found to be influential on persistence at an activity (Roberts et al. 2004), although this seems to be at a contextual and more global level of motivation. These orientations are important in maintaining an overall level of motivation for the activity, however, may not be sensitive enough to detect immediate changes in situational motivation. On reflection, the idea that motivational orientations may fluctuate situationally, might lead to limited accomplishment, as the individual's motivational influences become unstable and subject to constant change thus potentially diluting the individual's attention towards the task. Research has suggested that an individual's motivational orientations are complex and consist of a range of interrelated orientations including those orientations which are considered to be less desirable, such as ego and avoidance orientations (Weiss and Ferrer-Caja 2002; Biddle et al. 2003). Thus for any activity there could be a ratio of situational motivational orientations which then determine the main motivational focus of the individual for that activity. With the exception of goal setting, previously discussed theories, goal achievement and need achievement theories, do not acknowledge a situational perspective. Whilst data can be collected in a situational manner, it is unlikely that immediate changes will be detected possibly due to the broad categorisation of the identified motivational orientations. Goals and goal achievement data, however, may reveal more about how the individual is motivated for each situation as they direct their attention towards a specific task. Self-determination theory (SDT) does acknowledge a situational level of motivation through the extended hierarchical model (HMIEM; Vallerand 2000) and for this reason SDT will be the main theoretical framework for this thesis.

### **2.2.6 Self-determination theory**

Self-determination theory (SDT; Deci and Ryan 2000, 2008) is a commonly used theoretical framework for understanding the multidimensional perspective of motivation (Markland and Tobin 2004; Faye and Sharpe 2008; Lonsdale et al. 2009). SDT combines humanistic, psychoanalytic and developmental theories with an organismic perspective which further explain motivation; allowing individuals to develop regulatory processes enabling self-determined behaviours (Deci et al. 1994; Levesque et al. 2008; Niemiec et al. 2008). The development of SDT has occurred through the structure of mini theories which help to describe separate constructs within SDT (Ryan and Deci 2000). For example, cognitive evaluation theory (CET; Deci 1971) describes the effects of intrinsic motivation in social contexts linking

concepts of autonomy supportive, controlling and amotivated states with specific motivations (Ryan and Deci 2000). Organismic integration (Deci et al. 1994) describes the processes of internalisation and regulation of motives, specifically to explain the concept of extrinsic motivation (Ryan and Deci 2000). Causality orientations theory (Deci and Ryan 1985) describes the way in which individuals perceived factors which support or undermine their autonomy (Ryan and Deci 2000). Finally, basic needs theory (Ryan 1995) explains the relationship between motivation and goals to create feelings of well-being and general life-satisfaction (Ryan and Deci 2000a).

Self-determination theory (SDT) suggests that individuals develop self-regulatory processes helping to establish self-determined motives which are perceived as autonomous choices (Deci et al. 1994; Levesque et al. 2008; Niemiec et al. 2008). A key concept for SDT is the satisfaction of three identified psychological needs which can affect the individual's perception of themselves: namely autonomy, competence and relatedness (Ntoumanis 2001; Sheldon and Filak 2008; Deci and Ryan 2008; LaGuardia 2009). The basic psychological needs of autonomy, competence and relatedness, within SDT represent innate characteristics rather than motives and goals and are therefore considered to be universal needs (Ryan and Deci 2006). Competency refers to a sense of being effective in various actions and seeking out opportunities to maintain and develop effective skills (Ryan and Deci 2006). Relatedness is a sense of belonging and a need to feel respected by others (Niemiec and Ryan 2009). Finally autonomy reflects the origins of behaving in various situations, for example, where individuals feel their actions are manifestations of self-expression they are considered to be autonomous (Ryan and Deci 2006). It is in the achievement of satisfying these needs that self-determined behaviour is observed (Faye and Sharpe 2008). Where these needs are fulfilled the individual is more likely to internalise previously external values (Niemiec et al. 2008) and thus experience more positive affect (Riketta 2008). Where individuals have less choice about fulfilling one need at the expense of another, this may lead to partial or suboptimal internalisation manifesting as introjected regulation (Niemiec et al. 2008). In cases where these psychological needs are not achieved individuals tend to adopt and focus on extrinsic goals. These external measures can be inconsistent and unstable as they rely on the perceptions, outcomes and behaviours of others rather than indicators of internal satisfaction which would have resulted had the needs been satisfied (Deci and Ryan 2008).

The focus of SDT suggests that individuals who are self-determined perceive an element of choice in their decisions to participate in an activity and are willing to spend more time and

energy on that activity (Vansteenkiste et al. 2006; Deci and Ryan 2008). Lack of perceived choice in participation is recognised in SDT as controlled behaviour and generally results in perceptions of external pressure to participate (Deci and Ryan 2000). Under these conditions of external pressure, if performance starts to fall short of expectations, the individual can feel dissatisfied, perceive themselves to be incompetent eventually experiencing a loss of motivation for that activity (Sarrazin et al. 2002). Individuals who feel largely autonomous in choosing to participate in an activity are considered to be self-determined and will generally report high levels of intrinsic motivation which are the most autonomous forms of motivation according to SDT. Less self-determined individuals may demonstrate more controlling motivational regulations such as extrinsic motivation.

The need for relatedness is more important than merely wishing to be highly regarded and experiencing a sense of belonging; Niemic and Ryan (2009) suggest that individuals are more likely to internalise and integrate others beliefs and values with their own, if that person is well liked and the individual feels a connection with that person or a group who hold similar values. Within a sports environment allowing individuals to feel supported and have an element of choice in their activities, engenders feelings of relatedness (Adie et al. 2008). This increased relatedness coupled with internalisation of motives, values and beliefs leads to persistence in behaviour in particular of the less interesting aspects of the activity which can serve to enhance performance (Niemic and Ryan 2009). Relatedness is also linked with athletic identity and Stults-Kolehmainen et al. (2013) found that male athletes reported higher levels of intimacy relatedness than female counterparts suggesting that males perceived sport as a basis for male bonding where they may not feel comfortable having close relationships with other males in everyday activities. This finding could also suggest that males have a stronger athletic identity than females within sport (Stults-Kolehmainen et al. 2013).

In a sport and exercise environment the need to feel or attain a level of competence is a strong part of the motivation for undertaking the activity (Baker and Davison 2011; Ullrich-French et al. 2013). The basic need for competence is highly influential with regard to the quantity, or high amount of motivation, however, where the need for competence is not satisfied, this can affect the quality of motivation (Mouratidis et al. 2008). Perceptions of competence can change quickly depending on the outcome of the competency and the nature of feedback received (Mouratidis et al. 2008). For example, Hollombeck and Amorose (2005) found that positive feedback engendered high perceptions of competence. Individuals who have had repeated

successful experiences in sport and exercise will also have higher levels of perceived competence (Baker and Davison 2011).

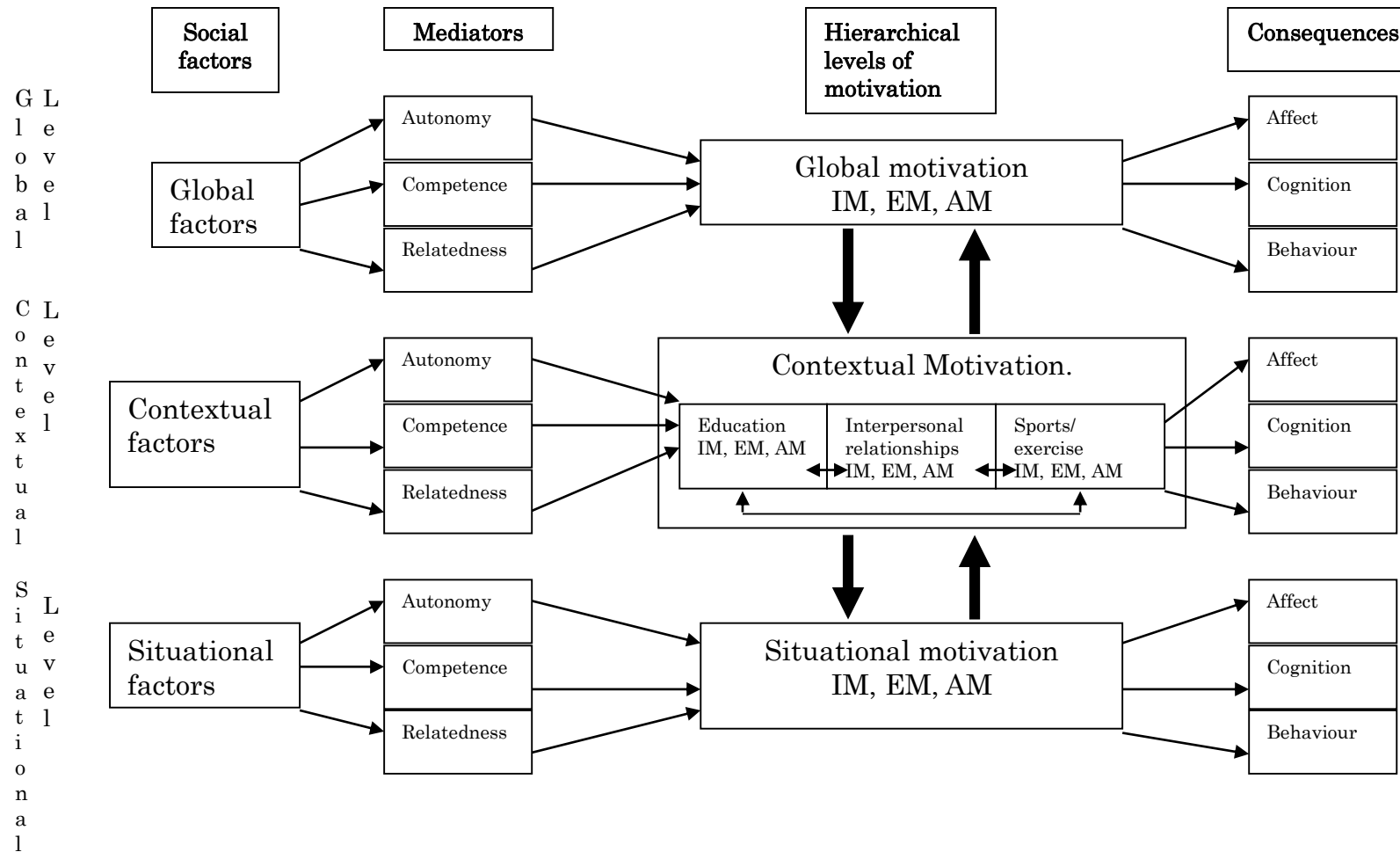
In conceptualising the HMIEM Vallerand (2000) noted similarities between SDT and the new multidimensional perspective such as the different types of motivations along the self-determined continuum (intrinsic, extrinsic and amotivation), the fulfilment of the basic psychological needs and the predictable outcomes from motivation namely, affect, cognition and behaviour. However, Vallerand (2000) also note differences between HMIEM and SDT including a hierarchy of motivational processes and sequencing of the psychological needs within motivation. Whilst Deci and Ryan (2000) propose a causality-orientation and a domain-specific level of motivation for considering motivation within SDT, there is no expansion of this to consider a situational or state level of motivation which is covered in the HMIEM (Vallerand 2000). Therefore, the HMIEM (Vallerand 2000) shows multilevel perspectives of motivation providing a basis for understanding the processes of intrinsic, extrinsic motivation and amotivation at different levels of analysis; the global, contextual and situational levels (Vallerand and Lallande 2011). These processes are mediated by social and personal determinants generating foreseen outcomes in a horizontal and vertical manner (Vallerand and Losier 1999; Vallerand and Lallande 2011). The hierarchical structure suggests relationships between the global, contextual and situational levels (Gillet et al. 2010). The more stable characteristics at the top of the hierarchy, the global level, influence the motivational strategies of the individual at the contextual level which in turn can sway the motivational orientations at the situational level of generality in a top down approach (Lavigne et al. 2009). However, Lavigne et al. (2009) also found a recursive, bottom up, approach was true where similar repeated situational experiences became more contextual in nature and over time influenced the individual's global motivational strategies.

Thus, the HMIEM (Vallerand 2000) extended the concepts of SDT, suggesting that self-determined motivation occurs at three levels of generality, namely global, contextual and situational levels (see figure 2.1). The HMIEM proposes that motivation leads to affective, cognitive and behavioural consequences similarly at the three levels of generalisation (Vallerand 2000; 2008). At the top of the hierarchy are global motives which relate directly to an individual's underlying dispositions and personality traits (Roberts et al. 2004; Lavigne et al. 2009). The contextual level of motivation refers to general motivational orientations within specific contexts or domains, for example, academic context, social context or sports context (Roberts et al. 2004; Lavigne et al. 2009). The situational level of motivation includes

immediate motives, such as goals at a given moment during or toward a specific activity (Roberts et al. 2004; Lavigne et al. 2009). These hierarchical levels have been found to influence each other both through a top-down and a bottom-up process (Baird et al. 2006; Mata et al. 2009).

Situational motivation refers to motivation within specific circumstances (Wilson et al. 2003; Chen and Hancock 2006; Conroy et al. 2006). Over a number of similar circumstances motivation can be reclassified as more contextual forms which then interrelate with situational motivation in a top-down and recursive bottom-up approach (Lavigne et al. 2009). Global motivation is the broadest level of generality and represents motivation in general across many different contexts (Vallerand 2000) which can also affect and be affected by, contextual motivation. The HMIEM suggests conceptually similar processes to the explanations of personality theory in relation to personality states and traits and individual differences (Smith 2008). Through these recursive processes global motivational orientations may change gradually over time based on influential and continuous interactions between the individual and similar situations (Lavigne et al. 2009).





**Figure 2.2.6** Hierarchical model of intrinsic and extrinsic motivation (Vallerand 2001 cited in Roberts 2001: p.266).

Self-determination theory also distinguishes between the concept of quality and quantity of motivation experienced. Good quality motivation consists of more self-determined intrinsically focused motivational regulations, whereas poor quality of motivation is largely externally controlled through extrinsic factors and therefore, less self-determined (Vansteenkiste et al. 2009). The quantity of motivation concept, however, includes both intrinsic and extrinsic factors and thus, a high quantity of motivation will include both autonomous and controlled forms of motivation (Ullrich-French and Cox 2009). However, a greater quantity of motivation does not always lead to optimal outcomes if the overriding motivational type is of poor quality and generally less self-determined (Deci and Ryan 2008; Niemiec et al. 2008; Vansteenkiste et al. 2009). Through the use of quality and quantity of motivation data and with the inclusion of the hierarchical model, SDT and the HMIEM lend themselves to more accurate assessment of the intensity of different types of motivational orientations in specific situations, which aligns with the main aims for this thesis.

The literature is very much divided in how it discusses and views sport versus exercise motivation. However, the main difference appears to be the lack of direct external competition within an exercise setting and the different outcomes expected from either a sport or an exercise situation, these perspectives will be discussed further in the next sections (see section 2.3 page 21 and section 2.4 page 23). Although individuals in an exercise setting can be competing against those around them and will be assessing their competence in comparison with others for different tasks, the process is more implicit and controlled by the individual. In the sport setting though, this comparison is expected and is more explicit leading directly to achievement of performance outcomes. The literature more recently agrees that for many activities a combination of motivational orientations are most effective in maintaining motivation across a range of situations. As SDT (Deci and Ryan 2008) identifies a continuum of motives for intrinsic and extrinsic motivational orientations, exploring changes for each subscale will help to develop an understanding of motivational change at the situational level. These changes at the situational level may also be used as a defence mechanism to protect the individual's self-image and issues of self-handicapping are briefly discussed in this section. However a continuum may not be the most accurate method for expressing the complex mixture of motivational orientations, particularly where literature finds combinations of both intrinsic and extrinsic motives for the same activity (Biddle et al. 2003; Conroy et al. 2006; Deci and Ryan 2008, see section 2.5 page 24 for further discussion).

## **2.3 Sport motivation**

There are differences between sport and exercise motivations (Frederick and Ryan 1993) which are centred around previous performance, competence, social status and self-importance. In competitive sport situations, previous performance outcomes play a significant role on future motivation (Vallerand and Losier 1999) through perceptions of competency. However, failure may be attributed to a lack of competence which negatively influences intrinsic motivation (Gillet et al. 2009). Performance outcomes may also act positively on motivation through confirming goal achievement and increasing other motivational orientations (Gillet et al. 2009). The physical nature of sports performance lends itself to a task orientation focus as athletes carry out specific tasks and devote resources to the task as part of their overall performance behaviour (Spray et al. 2006). However, in competitive situations, Fortier et al. (1995) found that athletes had less intrinsic motivation to accomplish and more extrinsic motivation for identified regulation than recreational athletes. This finding may be a result of an increased focus on winning and outcomes during competition which develops a reliance on extrinsic motivation and eventually undermines intrinsic motivations (Mallet 2005). The research expects that intrinsic motivational orientations will be high to accommodate persistence and competency; however, this is not always the case in sporting situations. This difference may be accounted for within SDT as the distinctions between intrinsic motivation to accomplish and extrinsic motivation for integrated regulation are quite subtle. If the focus of behaviour is concerned with the process of working on and practising a task then the motivational orientation is related to intrinsic motivation for accomplishment. Where the focus for behaviour is on goal attainment and the underlying values have been internalised, the motivational orientation changes towards an extrinsic motivation for integration (Ntoumanis 2001; Barkoukis et al. 2008). Therefore, an increase in the athlete's task orientation or intrinsic motivation could be explained through a focus on completing the task competently rather than attaining the outcome. However, where values have not been internalised effectively, a goal attainment focus may relate directly to an external regulation of motivation and associated rewards.

The ego orientated athlete expects that success in sport will enhance social status and self-importance and believes that higher ability will result in success (Ryska 2002a; Smith et al. 2006a). However, this reliance on normative comparisons as an indicator of competence is associated with greater levels of anxiety and concern for the highly ego orientated athlete (Smith et al. 2006a). Where ego orientated individuals and teams do not successfully demonstrate their competence based on normative values (i.e. winning) they may show decreased motivation for the task in the future (Gill and Williams 1996; Steinberg et al. 2001; Smith et al. 2006a). In

contrast, task orientated individuals benefit from sport skill improvement (Ryska 2002a). They believe that effort along with cooperation with others leads to success and corresponds with greater enjoyment for the activity through increased intrinsic interest and reduced performance-related anxiety (Smith et al. 2006a). However, combinations of intrinsic and extrinsic goals are needed to meet the complex demands of a sporting situation.

Self-determined, autonomous and intrinsic orientations are found to be positively related to good performance (Gillet et al. 2009). This may be due to the increased likelihood for individuals high in these constructs to select and utilise adaptive performance strategies (Vallerand 2000; Spray et al. 2006). The more self-determined and intrinsically orientated individuals tend to adopt more task and mastery orientated goals which in turn enhances self-esteem and feelings of competence resulting in perceived successful performance (Conroy et al. 2006; Hein and Hagger 2007). However, in a competitive sporting environment where it is difficult to ignore normative comparisons, extrinsic motives and amotivation were found to increase over the course of a season (Conroy et al. 2006). The implications for the development of younger players motivational orientations suggest that within a sports environment there could be a gradual shift towards extrinsic motives. This would create increased external expectations and pressures on young people, leading to decreased enjoyment for the activity and possibly dropping out of the activity altogether. Furthermore, Beaudoin (2006) found that the more self-determined form of extrinsic motivation, namely identified regulation, was significantly higher for younger players than for older players. However, changes in goal orientations over the season can influence reported levels of intrinsic and extrinsic motives for an activity over the same time period (Conroy et al. 2006). Thus helping younger players develop a combination of motives over a season can help to provide opportunities for success based on a task orientation and in turn, increase satisfaction with the activity.

Coaches are a major influence on an individual's motivation in sport as they have an active role in athletes' training and competition experience (Reinboth and Duda 2004). Teams and groups may also impact on the individual's motivational orientations in relation to creating or undermining a specific motivational environment (Downie et al. 2006). Motivational climate is usually heavily influenced by the coach, teacher or leader in sports situations (Cecchini et al. 2001; Wiersma and Sherman 2008). In general it is expected that where the coach sets a task mastery environment, athletes motivational orientations will be predominantly reported as task mastery (Wells et al. 2006; Hein and Hagger 2007; Papaioannou et al. 2007). Different to the exercise setting where the instructor can also set a task mastery environment, in the sports

setting there is a constant underlying expectation and understanding that accomplishing a task well eventually leads to a public success or failure comparison with another individual or team. Social implications for motivational climate are also recognised through the impacts of peer relationships within teams and groups and the effect others have on an individual's motivational orientations (Chen and Hancock 2006; Smith et al. 2006a). Where an individual perceives that team goals have progressed beyond their own goals, they may alter their goal focus to align with this perception which may result in a shift towards extrinsic orientations (Baumann and Kuhl 2005; Downie et al. 2006; Vansteenkiste et al. 2006).

## **2.4 Exercise motivation**

There is much evidence to suggest that starting an exercise programme is relatively common, but that there is often a lack of persistence for the continuation of these exercise programmes (D'Angelo et al. 2007). It is unclear why many people do not participate in exercise as there is increasing awareness and acceptance that exercise has both psychological and physiological benefits (Jones et al. 2004). Intrinsic motivation is regarded as important particularly in maintaining participation during exercise and it is often prolonged adherence to an activity which develops commonly identified benefits (Carver and Baird 1998; Lucidi et al. 2006). Although intrinsic motivation is a key factor for persistence, it is only after the individual has participated long enough to internalise these reasons that intrinsic motivation becomes a major factor in the present moment in which the action is performed (Recours et al. 2004). There is evidence that self-determined forms of intrinsic motivation relate to increased frequency for participation in exercise (González-Cutre et al. 2011) and that the introduction of extrinsic rewards can reduce the participation rate even amongst longer term exercisers (Lewis and Sutton, 2011).

Ego orientated individuals have a desire to compare themselves with others across many life situations including exercise (Kilpatrick et al. 2003). Individuals may compare body shape (Sabiston et al. 2005) and competency (Frederick and Ryan 1993; Gavin 2004) with an expectation that immediate changes in these constructs will occur. These external comparisons can be linked to social status, although differently to the sport setting, they are not explicitly judged as an overall success or failure indicator. Within exercise these comparisons are linked more to a self-image focus whereas in the sport setting it is more about comparison of competency. Whilst these extrinsic motives may form initial reasons for exercise, perseverance is linked to more self-determined forms of motivation. However, some health benefits may be

perceived as more external but the process of internalisation may help to enhance self-determined and autonomous forms of motivation (Maltby and Day 2001; Standage et al. 2008). Thøgersen-Ntoumani and Ntoumanis (2006) and Wilson et al. (2003), found high levels of extrinsic motivation for introjected regulation amongst exercisers, which could be linked to the individual's increased awareness for healthy, active lifestyles provoking feelings of shame and guilt if the individual does not manage to exercise regularly.

More recently, research has found that sustained exercise is most likely to occur when an individual has a combination of intrinsic and extrinsic motivations to facilitate behaviour (Standage et al. 2008). Where adherence is inadequate, it may be that exercise modes do not match participants' goals or that activities are not considered diverse enough to fulfil the multiple motivational orientations found in many individuals motivational makeup (Gill and Williams 1996; Yu et al. 2002; Allen 2003; Recours et al. 2004). There are differences in sport and exercise motives and motivational orientations, however, these differences may be focused more on the underlying values and expectations individuals have developed for each mode of activity. Research is suggesting that for effective participation both in sport and exercise settings a combination of motives and orientations should be developed.

## ***2.5 Multiple motives***

It can therefore be assumed that an ideal profile for motivational orientations in both sport and exercise should encompass intrinsic and extrinsic perspectives along with a task and ego goal orientation. Understanding the effects of both intrinsic and extrinsic motivational influences is important in order to determine an individual's intensity of effort and participation persistence (Martens and Webber 2002). Biddle et al. (2003) found that athletes who demonstrated an enthusiasm and interest in sport had both a high task and a high ego orientation. An individual predominantly high in ego orientation who demonstrates negative behaviours in sport may not reduce these behaviours simply through decreasing ego orientations (Kavussanu 2006) because task and ego orientations have been found to be orthogonal (Smith et al. 2006a). However, individuals high in task and ego orientations may not show maladaptive and negative behaviours because those with high task orientation tend to select adaptive strategies for behaviour (Filby et al. 1999; Smith et al. 2006a).

This is also the case for internal and external motives such that no one individual is entirely intrinsically nor extrinsically motivated and instead there are a combination of orientations

required in order to satisfy the many and complex motives of an individual at any one time point (Weiss and Ferrer-Caja 2002; Vansteenkiste et al. 2006; Deci and Ryan 2008). Thus it may be that in a situational context the ratio of intrinsic and extrinsic motives may vary in intensity. However, where SDT defines distinct differences between intrinsic and extrinsic motivation, this may be due to the eventual outcome focus of the individual in relation to the actual task. For example, in an exercise setting the goal and expectation is more towards accomplishment (an intrinsic motive) whereas in a sport setting the expectation is about achievement (an extrinsic motivation for identified regulation). In a situational context, these subtle differences may be greater and more explicit as the individual will focus on different aspects of their performance. However, over time from a more contextual perspective, the distinctions between some intrinsic and extrinsic factors may be less clear.

### **2.5.1 Self-handicapping**

Even when individuals demonstrate an ideal motivation profile drawing on a combination of different motivational orientations, the actual outcomes and experiences of an activity could alter the individuals' perception of the benefits and costs associated with that activity resulting in changes in motivation over time (Bandura 1977). Some individuals may continue to set very low expectations for performance despite previous success because it protects perceptions of self-esteem in case of failure, and this is a process of self-handicapping. Ryska (2004) found a significant relationship between self-handicapping and activity enjoyment where participants reported greater enjoyment when self-handicapping despite perceptions of success or failure. However, individuals may also use the negative affect created by thoughts of potential failure to arouse current or future effort (Elliot and Church 2003). Although these negative feelings do not necessarily lead to excessive post event anxiety, individuals may suffer increased fatigue and emotional variability which affects future performance (Elliot and Church 2003). Self-handicapping works in the short term but over a longer time period there is an overall decrease in effort due to lowering of goal expectations and negative mood states (Zuckerman and Tsai 2005).

The individual handicaps their potential performance by deliberately placing barriers in the way of performance and therefore, could be seen to have an excessive fear of failure (Elliot and Church 2003; Zuckerman and Tsai 2005). Thus when failure occurs, individuals can attribute it to the various obstacles rather than deficits in their innate ability or other self-constructs which may affect self-esteem (Elliot and Church 2003; Zuckerman and Tsai 2005). Conversely, this process of attribution may enable individuals to focus more on achievement rather than failure,

as the reasons for failing have already been identified by the individual as suitable for protecting self-esteem (Zuckerman and Tsai 2005). Unsurprisingly, those who protect themselves from failure through self-handicapping have been found to enjoy competition more than others. This could be further enhanced as the focus on achievement leads to satisfaction which is intrinsically orientated resulting in continued practice and improvement, culminating in increased confidence and motivation for the activity (Deppe and Harackiewicz 1996).

The main focus for this thesis is situational motivation. Within the situational perspective it is important to take into account both the perceived and actual demands of the activity within that situation, and the individual characteristics of the person undertaking that activity. These characteristics or traits will influence how the individual perceives and interprets the demands of the situation and how they may respond to those demands. For example, Lewis and Sutton (2011) found that extroversion, conscientiousness and agreeableness were strong predictors of exercise frequency. The underlying traits and values of the individual will influence the interpretation of a situation including the goals which individuals' are likely to set in each situation (Hennecke et al. 2014). These values and traits have been developed over time and influence the cognitive processing traits used to assess situational demands eliciting an individual response and action similar to processes identified in personality theories. Values are distinct from personality traits in that values are beliefs about how one should behave and personality traits are part of the individual's nature about how they tend to behave and they are a complex combination of learned and natural behaviours (Parks and Guay 2009).

## **2.6 Personality**

Personality is important in sport and exercise performance as it has long been found that these global traits can help predict individual outcomes (Rhodes and Smith 2006; Allen et al. 2013). Many studies have been carried out showing that elite level athletes are more extroverted and less neurotic than recreational athletes (see Allen et al. 2013 for details). However, these dispositional traits are more predictive of long term performance rather than short term outcomes, as short term performance outcomes can be reliant on a single error in judgement from either the individual, opponent or official (Allen et al. 2013). Thus personality research within sport and exercise tends to focus on strategies the individual adopts when faced with short term failure outcomes and these have been successfully linked with different personality types (Allen et al. 2013).



Personality can be defined as unique traits which have long lasting and direct influences on behaviour (Ewen 2010). Personality traits are a broad domain which influences, controls and directs behaviour resulting in flexible behavioural responses which takes into account the individual and the situation (De Raad and Schouwenburg 1996; Steyer et al. 1999; Elliot and Thrash 2002; Baird et al. 2006). An individual's traits appear to influence cognitive and affective processes similarly (Hong and O'Neil 2001) but are also thought to change gradually over time, potentially affecting and being affected by the motivations of the individual (Baird et al. 2006). This is similar to Lavigne et al. (2009) who suggest that the HMIEM demonstrates a top-down and a recursive effect. However, there is some uncertainty as to whether personality traits can fully explain the broad and diverse spectrum associated with individual motivation (Judge and Ilies 2002). Trait personality theory research has seen a number of developments and progression from multiple behavioural categories towards a big three paradigm and a five-factor approach being the most commonly cited models (Eysenck 1985; Costa and McCrae 1992).

### **2.6.1 Big Five Model**

The development of the five-factor approach arose through analysis and the merging of five common factors which appeared on numerous personality inventories (Ackerman and Heggestad 1997). Previously personality research identified sixteen fundamental motives which are inherent within the human population, and these are thought to be linked to a five-factor model of personality (Costa and McCrae 1992; Frederick and Morrison, 1999; Olson and Weber 2004). The five personality factors included in this approach are extroversion, neuroticism, agreeableness, conscientiousness and open-mindedness. Specific combinations of the five-factor model are related to good performance. For example, extroversion and neuroticism can affect the speed of response to a stimulus, but neuroticism is additionally coupled with negative emotions (Robinson et al. 2005). High levels of extroversion and neuroticism have been linked with an increase in overall motivation (Olson and Weber 2004). However, serious-mindedness and planning orientations, which are part of open-mindedness, combined with low arousal avoidance, related to low levels of neuroticism, were traits found in successful performers (Jackson and Schomer 2006). Extroverted individuals are thought to seek out stimulating situations to increase levels of arousal and enhance performance up to an optimal point (Kirkcaldy, 1980; Tamir, 2005). In competitive situations, individuals low in agreeableness, were more competitive whilst those high in agreeableness were more cooperative (Olson and Weber 2004).

### **2.6.2 Big Three Model**

Eysenck's big-three paradigm has been a major framework for personality research and there is a larger supportive body of literature for the big-three than for the big-five model (Eysenck 1993; Zuckerman et al. 1993). Although many different traits have been identified, the extroversion-introversion and neuroticism-stability continua are the most prevalent, although disagreement still occurs in the specific characteristics or processes which classifies and differentiates between them (Zuckerman et al. 1993; Ackerman and Heggestad 1997; Mor et al. 2008). The big-three traits identified in this theory are extroversion, neuroticism and psychoticism. Eysenck's theory suggests that these big-three traits are directly linked to physiological processes such as arousal and thus, can provide a basis for predicting performance (Ackerman and Heggestad 1997; Matthews and Gilliland 1999). Both the big-five and the big-three trait theories similarly show links between extroversion, neuroticism and arousal seeking behaviours. Arousal is important in activating the individual towards an activity (Vaez Mousavi et al. 2007) and within SDT this activation or drive to achieve a goal is paramount in the overall motivation processes but particularly at the situational level and according to the HMIEM results in affective, cognitive and behavioural outcomes. The concept that an individual's levels of arousal can be influenced at a global personality level, also fits with the HMIEM and similar to the HMIEM top-down approach (Lavigne et al. 2009) it can be assumed that the global level of personality also influences situational motivation through processes of arousal and activation control towards a specific task or activity. Gray's (1975) three factor arousal theory helps to further explain this trait influence on behavioural control (Whitehead et al. 1996).

### **2.6.3 Gray's Three Factor Arousal Theory**

Gray's (1975) three factor arousal theory suggests that there are two areas in the brain which are mutually antagonistic, one represents the behavioural activation system (BAS), located mainly in the prefrontal cortex of the brain, and the other relates to a behavioural inhibitory system (BIS), which seems to be accounted for as a process rather than associated with a specific brain structure (Amodio et al. 2008). Both BAS and BIS contribute to a third factor which is the underlying arousal levels in relation to flight and fight responses (Whitehead et al. 1996; Jackson et al. 2003). The outcome of inhibitory and activation processes from these two areas input into a third factor, the arousal system which has an effect on behavioural intensity (Fowles 1980). Excessive stimulation of one system is thought to inhibit the other generating additional non-specific arousal. This additional arousal could be perceived as anxiety or excitement depending on which system is being inhibited (Kirkcaldy 1980; Kerr 1991; Whitehead et al. 1996) and whether the individual is predominantly extrovert, introvert, neurotic or stable (Elliot

and Thrash 2002; Jackson et al. 2003; Tamir 2005). Gray's (1975) theory suggests the introversion-extroversion continuum relates to general levels of somatic arousal, where introverts have higher levels of general arousal than extroverts. The neurotic-stable continuum is linked with responses to emotional stimuli based on the interpretation of arousal, such that individuals high in neuroticism experience arousal quicker and more intensely than stable individuals (Schneller and Garske 1976; Wrisberg 1994; Matthews and Gilliland 1999).

## ***2.7 Trait and state personality processes***

Trait personality processes are relatively constant and suggest that individuals may adopt specific strategies when responding to situational pressures. These dominant coping strategies can be dissimilar to other strategies used by others with different personality traits in the same situations (De Raad and Schouwenburg 1996; Steyer et al. 1999; Deponte 2004). Whilst trait factors can change, this is largely due to gradual alterations or long term exposure to specific situations requiring different responses and these modifications may be considered effective adaptations to changing circumstances (Baird et al. 2006). Latent state-trait theory suggests that measuring a trait must encompass various state measurements and likewise measuring a trait in its simplest terms averages states measures across a range of situations (Steyer et al. 1999). Thus latent state-trait theory supports the notion of gradual changes in traits suggesting that an individual is exposed to diverse stimuli causing them to react differently even in similar situations as they may be in disparate psychological states in each different situation (Steyer et al. 1999; Awang-Hashim et al. 2002). However, from the trait theory perspective discussed earlier, the individual will have a dominant coping strategy for their current psychological state but this may be different for contrasting states. The latent state variable is characterised by a complex interaction between both the individual and the situation (Lu 1999) whereas the latent trait variable focuses only on the individual (Steyer et al. 1999). Where situational demands are perceived as more intense than personality responses, this may disrupt the individual's dominant trait response causing unpredictable behavioural responses (Koestner et al. 1989).

Regulating behaviour and performance through motivation can be considered a trait-like process, however, at the situational level, emotion, previous experiences and continual feedback may alter behaviour according to the changing demands of the situation (Hong and O'Neil 2001). Therefore, the most important factor in situational motivation could be how an individual identifies the situational constraints and interprets the situation (Rose et al. 2001). The regulatory processes for performance consistency at the situational level, will then need to be

flexible and individually moderated (Hardy and Gustavo 2005; Baird et al. 2006). Inflexible approaches are assumed to be a result of the individual's inability to access or consciously understand the various systems involved (Robinson et al. 2005). Whilst certain personality traits can influence decisions to select particular activities, if perceived situational demands are not congruent with individuals personality traits this may result in internal conflict which can divert effort away from optimal performance (Hong and O'Neil 2001; Pushkar et al. 2002).

Individuals are however, more likely to have a mixture of strategies and processes to draw on with one being more dominant according to the individual's personality traits (Bindarwish and Tenenbaum 2006). Thus according to Bindarwish and Tenenbaum (2006) it may seem that internal conflict would not arise, although if the dominant strategy was not effective for dealing with the situational demands then attention would be diverted towards accessing more appropriate and effective strategies.

Aligning goals with the individuals underlying values can result in higher achievement through either a cognitive process, whereby individuals think about their values prior to making a decision, or an affective mechanism where individuals feel more positive when acting consistently in line with their values (Parks and Guay 2009). Where individuals perceive value in a task this influences the motivational orientation of the individual in completing and achieving within the task (Hulleman et al. 2008). It may be that those with different personality traits perceive different values in each activity, for example, extroverts persist more frequently at activity than introverts (Sutton and Lewis 2011), however introverts can internalise motives and values more easily (Henjum 1982; Opt and Loffredo 2003). Thus the value of activity for the extroverts could be related to quantity of performance or motivation whereas for the introverts the value of the exercise may be related to quality of performance or motivation (Elliot and Thrash 2002; Morossonova 2003) and this is further explored in study 1 (see page 50).

Situational motivation, according to the HMIEM, suggest that the individual's response to perceived situational demands coupled with the underlying trait processes influences affect, cognition and behaviour (Vallerand 2000; Deci and Ryan 2008). State personality processes discussed above, suggest that, depending on the psychological state of the individual, the trait response would change resulting in altered behaviour. Therefore, investigating affect as part of the self-regulatory process for situational motivation is warranted.

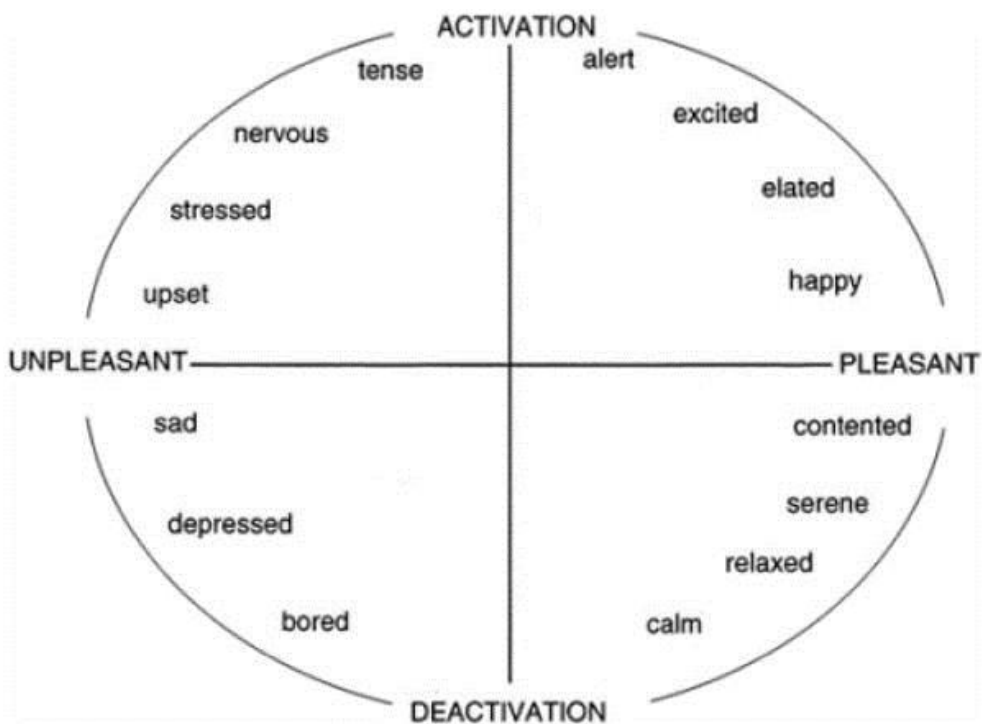
## **2.8 Affect**

Distinctions between affect, mood and emotion constructs are acknowledged through the literature (Haddock et al. 1994; Bryant et al. 1996; Gendolla and Krusken 2002; Jones 2003; Russell et al. 2003; Sutin and Robins 2005). The differences relate to the individual's experiences of these constructs, what caused them and their duration. Affect has largely been used to describe the overall experience of feeling positive or negative based on an individual perception of the valency regarding specific moods and emotions (Turnbull and Wolfson 2002; Lane et al. 2005; Miller et al. 2005; Kramer and Yoon 2007; Rhoden and West 2010). Mood and emotion are generally defined by how they differ, such that mood is not reliant on a specific stimulus, is usually less intense and of longer duration than emotion (Linnenbrink and Pintrich 2002; Lane et al. 2005). As emotions fade over time they can be classified as general mood states, becoming less intense (Crews 1992; Linnenbrink and Pintrich 2002). An emotional reaction to a stimulus primes the body for an immediate behavioural response which can be physiologically measured or subjectively felt by the individual (Jones 2003; Lane et al. 2005).

### **2.8.1 Affect theory**

A circumplex model of affect (Russell 1980, see figure 2.8.1) ) suggests that the valency of affect is experienced as bipolar on two distinct continua; pleasant or unpleasant and activation or de-activation and as these two constructs are purported to be orthogonal they help to integrate various mood and emotion models. Positive and negative affect have been shown to align with the pleasantness and unpleasantness continuum in the activated state (Watson and Clark 1997). Affective states are ordered on the circumference of a circle and there are decreasing positive correlations between each particular affective state the further around the circle they sit from each other (Remington et al. 2000). For example at a 90 degree separation two constructs will have less positive correlation and at 180 degrees affective states should be increasingly negatively correlated, thus helping to explain effects of bipolarity amongst affective states (Remington et al. 2000). Yik et al. (2011) suggests that the circumplex model is a suitable fit for an overarching construct such as affect. However, there are two differing perspectives regarding positive and negative affect. One suggests that they are independent or bivariate (on two separate continua) (Watson and Clark 1997), whilst the second perspective presumes an inverse or bipolar relationship where positive and negative affect are at opposite ends of the same continuum (Reich et al. 2003). A dynamic model of affect allows for both approaches under different environmental conditions. For example, under low stress individuals are able to process more complex information suggesting an independent assessment of affect while under

high stress conditions, attentional resources are focused on the immediate demands thus supporting a bipolar assessment (Reich et al. 2003).



**Figure 2.8.1** Russell's (1980) circumplex model of affect with the horizontal axis representing the valence dimension and the vertical axis representing the arousal or activation dimension (adapted from Posner et al. 2005).

### 2.8.2 Positive affect

Positive affect relates to feelings of enthusiasm and alertness. A high level of positive affect is associated with pleasurable feelings of high energy whereas low levels of positive affect are suggested to relate to lethargy (Watson and Tellegen 1985; Watson et al. 1988). Positive affect is thought to influence an individual's choice of activity more than negative affect (Kramer and Yoon 2007) and can result in increased exertion during difficult tasks (Gendolla and Krüsken 2002). Whilst participation in sport, exercise or physical activity does enhance positive affect (Turnbull and Wolfson 2002; Russell et al. 2003; Barnett 2006), this is further increased if the individual perceives it was their choice to participate in the physical activity (Miller et al. 2005). However, a lack of choice does not necessarily result in an increase in negative affect but generally results in decreased positive affect (Miller et al. 2005), a finding which provides additional support for independent continua of positive and negative affect.

### **2.8.3 Negative Affect**

Negative affect relates to unpleasant feelings of distress. Low levels of negative affect correspond with calmness, whereas high levels of negative affect are thought to include contempt, fear and guilt (Watson and Tellegen 1985; Watson et al. 1988). Negative affect could arise from perceived situational demands or an over-reliance on outcome measures as opposed to process measures, regardless of eventual level of achievement (Ogden and Whyman 1996; Tomaka and Palacios-Esquivel 1997; Linnenbrink and Pintrich 2002). Some individuals report a need for themselves to experience negative affect in order to perform optimally (Gurthrie et al. 1997; Jones 2003). However, too much negativity may result in dropping out of the task due to reaching motivational limits (Eubanks et al. 2002; Gendolla and Krüsken 2002) or selecting maladaptive coping strategies (Pushkar et al. 2002; Robinson and Tamir 2005). High levels of negative affect are usually experienced more intensely than positive affect (Otani et al. 2007) and can distort the perception of task demands, with tasks seeming more difficult and requiring more effort for completion or success (Gendolla and Krüsken 2002). This increased intensity of negative affect can eradicate previous positive results or feelings, leading to further increases in negativity and higher risk of performance disruption (Turnbull and Wolfson 2002; Otani et al. 2007).

When an individual attempts to control their levels of positive and negative affect this becomes part of an overall concept of self-regulation where the individual undertakes a process of channelling and adapting affective responses and resulting behaviour. At the situational level of motivation this self-regulation is important to enable effective goal directed behaviour. The individual's motivational orientations and perceived situational demands provide a framework within which the individual experiences drive and activation towards a task. As previously discussed, the individual's tendency to select adaptive or maladaptive strategies will influence their behavioural response at the situational level of generality according to the HMIEM.

## **2.9 Self-regulation**

Self-regulatory processes are thought to monitor and control behaviour, cognition and motivational strategies through the management of affective responses (Shell and Husman 2008; Efklides 2011). It is suggested that, at the situational level, self-regulatory processes control the individual's cognitive and affective responses to goal progression and goal attainment (Efklides 2005), similar to SDT (Deci and Ryan 2000). Furthermore, the self-determined or volitional nature of a task is almost exclusively related to positive affect (Shell

and Husman 2008) which is thought to promote intrinsic motivation for a task causing increased time and effort to be directed towards that task (Westenhoefer et al. 2004; Isen and Reeve 2005; Thøgersen-Ntoumani and Ntoumanis 2006). Where the task is perceived as too difficult or taking up too many resources then effort may be withdrawn or diverted to an alternative task (Gendolla and Krüsken 2002). Affect alone does not solely predict physical and behavioural response but is combined with perceptions of task demands, identifying the level of effort required for specific goal benefits, balanced with perceived competencies and thus self-efficacy for the task (Gendolla and Krüsken 2002; Eklides 2011).

Assessment and monitoring of task demands and progress can cause a discrepancy between current performance and current status compared with future standards and expectations. The ensuing discrepancy suggests that the individual still has a need for competency and this will trigger a motivational response towards satisfying that need (Deci and Ryan 2000, 2008). The process for this, according to Carver and Scheier's (1982) control theory suggests that the discrepancy can provoke an increase in negative affect experienced which, through a process of activating and inhibiting behavioural response, develops into a need for action (Carver and Scheier 2002). The individual can perceive this need as desirable and in conjunction with adaptive coping strategies, this increases motivation for the task producing performance as explained in the self-regulatory process (Carver and Scheier 1982; 2002; vanDellen and Hoyle 2008). However, an individual experiencing high levels of negative affect can also generate high levels of physiological arousal, which may lead to inappropriate or ineffective behavioural responses (Smith 2006). As part of a protective self-regulatory process, where behavioural outcomes may be interpreted as negative, acknowledging how it could have been worse can lead towards more positive feelings about performance in the short term (Sirois 2004; Chatzisarantis et al. 2005). However, longer term implications for this process may predispose the individual to using avoidance strategies in the future (Zuckerman and Tsai 2005). Goal strategies, and self-regulation strategies can become interrelated as some individuals may be solely focused on reducing negative affect rather than task mastery and this process relates to the concept of extrinsic motivation for introjected regulation as explained in SDT (Gurthrie et al. 1997; Zuckerman and Tsai 2005; Thøgersen-Ntoumani and Ntoumanis 2006).

Performance within sport or exercise provides many opportunities on which to base perceptions of competence or achievement including outcome of actions, opportunities to control performance and related feelings. This information is used to regulate arousal and determine situational behaviour (Jones 2003; Gernigon et al. 2004; Otani et al. 2007). As such, goal



orientations and affect play an important role in strategic self-regulatory behaviour and effort in different circumstances (Shell and Husman 2008). Affect and emotions will influence the coding and interpretation of situational demands differently for each individual (Smith 2006), thus the ensuing levels of arousal and activation would also be perceived differently, uniquely influencing release of effort and direction of behaviour for a task. A study by Renfree et al. (2012) demonstrated that individuals performed better when they reported higher levels of positive affect and lower levels of negative affect right from the outset of trials. Furthermore, findings showed that during slower performances, perceptions of goal progress became negative during the trial whilst ratings of perceived exertion remained similar and power output was lower than for the faster trials (Renfree et al. 2012). Whilst this finding does not support control theory (Carver and Scheier 1982, 2002) which suggests that increased negative affect leads to action, Russell's (1980) circumplex model of affect can help to explain this finding. Individuals in an active state can experience both pleasant and unpleasant emotions. However, it may be that the valence of emotional response changes during activity in line with perceived progression through the activity and time remaining, intensity of the activity and perceived progress towards the goal for that activity. It is the combined effect of goal orientation, motivational intensity and affective response which this thesis intends to investigate.

## **2.10 Trait Affect**

Affective response may be important in the immediate situation, however, the individual's susceptibility to react positively or negatively to various situations may relate to personality traits such as extroversion or neuroticism (Bryant et al. 1996; Barnett 2006). These trait influences may cause individuals to behave in such a way as to influence affective and motivational experience, which over time become the more consistent response (Sutin and Robins 2005; Smith 2006). These processes are similar to personality processes discussed previously in this review. Affect and motivation are equally important factors for informing self-identity and self-image (Hareli and Weiner 2002; Jones 2003; Hardy and Gustavo 2005). Therefore, changes in affective and motivational response may transform how individuals perceive themselves influencing values and adjusting behaviours to conform with their modified self-belief (Linnenbrink and Pintrich 2002; Hardy and Gustavo 2005; Sutin and Robins 2005; Smith 2006). These trait like responses will guide the individual's response to each situation, providing a structure in which to set short and longer term goals and influencing the selection of appropriate strategies according to situational demands.

## **2.11 Situational motivation**

Motivation experienced at a given moment in time for a specific activity is termed situational motivation and is represented at the lowest level in the HMIEM (Vallerand 2000; Wilson et al. 2003; Chen and Hancock 2006; Conroy et al. 2006; Lavigne et al. 2009). Motivation has frequently been measured from a contextual approach but how motivation changes at the situational level has not been thoroughly investigated (Janman 1987; Frederick and Ryan 1993; Maltby and Day 2001; LaChausse 2006). Traditionally motivation theories have lacked an appropriate framework for addressing the complex processes of situational motivation (Nygård 1981; Veermans and Tapola 2004). Whilst SDT recognised situational motivation, it was only through the extension of SDT into the hierarchical model of intrinsic and extrinsic motivation which included specific processes for a situational level of motivation (Vallerand 2000).

The hierarchical model shows affect, behaviour and cognition as a consequence of motivation similarly at all three levels of generality. However, it may be that at the situational level, affect plays a more significant role as an antecedent which is not necessarily mirrored at the contextual or global levels (Linnenbrink and Pintrich 2002; Hardy and Gustavo 2005; Barnett 2006). As affect is influenced by how the individual responds to stimuli, which may have little to do with the task at hand, perceptions of situational demands and planned courses of action may be affected prior to the task or activity being carried out. Similarly goals for each activity would need to be set at the outset in order to direct the individual's attention and effort towards the task. Previous research has focused on the contextual level of motivation thus the effects of the consequences of situational motivation on immediate performance appear not to have been considered (Linnenbrink and Pintrich 2002). The situational process is potentially a more dynamic and less stable process which may occur rapidly across and between specific situations thus the end of one process acts as the immediate precursor to the next (Covassin and Pero 2004).

### **2.11.1 Self-regulation of situational motivation**

Although individuals may not be aware of how they are motivated for each behaviour and situation, how the individual feels may alter their perception of the situation, thus influencing subsequent behaviour (Locke and Latham 2004). The individual's perception of each situation may activate specific and unique subsets of cognitions and affect, influencing motivational status. This process occurs through monitoring and modifying progress towards achieving goals (Bandura 1989), perceptions of success and failure (Nygård 1981 ; Papaioannou et al. 2007) and re-examination of the situational demands leading to amended prioritisation of goals (Allen

2003; Veermans and Tapola 2004). Repeated experience of similar situations allows individuals to associate specific motivational orientations with that activity over time, (Levesque et al. 2008). This process then evolves into a contextual response for motivated behaviour over time, demonstrating a bottom up approach to the hierarchical model (Gagné et al. 2003; Mata et al. 2009). However, Lavigne et al. (2009) and Wilson et al. (2003) agree there may be subtly different sources and processes interacting at each level of motivation within the hierarchy with the contextual level being where the individual combines both personality and situational factors in order to meet higher order needs (Elliot and Church 1997; Carr 2006).

### **2.11.2 Situational differences**

At the start of an activity the individual perceives specific situational cues which may lead to increased levels of both physical and emotional arousal depending on their goal prioritisations and attached importance (Veermans and Tapola 2004). High arousal levels have been linked with increased uncertainty about meeting the demands of the situation. Whether this additional stimulation is beneficial or detrimental to performance may depend on personality characteristics and individual differences in selecting appropriate strategies to complete the task (Nygård 1981). Individuals with high levels of intrinsic motivation tend to report positive emotions and demonstrate greater concentration within tasks (Lavigne et al. 2009). Where intrinsic motivation is also coupled with an approach orientation, individuals are found to have a positive perception of their competence and abilities to achieve their goals (Covington and Mueller 2001; Schmalt 2005; Faye and Sharpe 2008). An extrinsic focus can provide additional incentive for a task including an indication of competency particularly where specific and immediate feedback is unavailable (Vallerand et al. 1986; Eisenberger et al. 1999; Vansteenkiste et al. 2006). However, dominant extrinsic tendencies lead to increased anxiety, decreased effort expenditure towards the task, reduced overall motivation and affects future adherence (Hollombeck and Amorose 2005; Vansteenkiste et al. 2006).

Where individuals are aware of their prevalent intrinsic and extrinsic goal focus in a specific situation, and have an ability to switch their focus between both types of motivation as necessary, these individuals may be more effective at maintaining situational motivation and enhancing performance behaviour at the situational level of generality. Previous research has paid attention to the potentially negative impact extrinsic factors have on intrinsic motivation (Pierro et al. 2006). However, at the situational level, effective performance needs to include both intrinsic and extrinsic strategies (Covington 2000; Steinberg et al. 2000; Merkle et al. 2002; Tauer and Harackiewicz 2004; Bailis et al. 2005; Hollombeck and Amorose 2005;

Vansteenkiste et al. 2006) and the individual may have to alternate regularly between these motivational orientations to maintain optimal motivation for a task (Pintrich 2000). Therefore, individuals need to set multiple goals across different orientations to promote high levels of overall situational motivation (Hall and Kerr 1997; Wentzel 1999; Covington 2000; Downie et al. 2006).

In situations where individuals have internalised their motives, appropriate goals can maintain and enhance situational behaviour (Elliot and Harackiewicz 1994; Wentzel 1999; Downie et al. 2006). However, goals also require an implementation strategy to prevent distraction and remain focused on the task in hand (Gernigon et al. 2004; Gallo et al. 2009). These goals may be hierarchical in nature, consisting of immediate, progressive and end point goals. Previous research has found that short term goals may be sacrificed in order to attain longer term achievement for specific situations (Wong and Csikszentmihalyi 1991; Covington 2000) although mainly for those higher in neuroticism (Tamir 2005). However, the literature does not identify the duration of short term and recommends that short term goals should still be included as longer term goals do not provide immediate feedback regarding progression (Roberson and Stewart 2006). Furthermore, immediate and continuous feedback is important in determining the level of effort required for goal achievement according to the constantly changing situational demands (Hong and O'Neil 2001) and in line with self-regulatory processes (Carver and Scheier 1982; 2002).

Goal progression and goal achievement feedback act as inhibitory or activation processes which maintain, increase or decrease performance behaviour in any situation (Gernigon et al. 2004). The resultant behaviour can change dramatically between situations possibly due to different perceptual, cognitive and affective processes used to determine action for optimal performance (Hollombeck and Amorose 2005). As the situational demands change, if the individual is using a range of short term strategies and goals covering several orientations, then behaviour will also change to meet the varying demands (Linnenbrink and Pintrich 2002; Gallo et al. 2009).

According to SDT, over time motives transform from a dominant extrinsic focus towards an intrinsic orientation, in a process known as internalisation (Sansone et al. 1992; Covington and Mueller 2001; Prusak et al. 2004; Chen and Hancock 2006; Bye et al. 2007). At the situational motivation level, intrinsic motivation has been defined as '*fun*' (Chen and Hancock 2006; Conroy et al. 2006) whilst extrinsic motivation is considered to enhance overall motivation depending on the contiguous rationales for the activity (Reeve et al. 2002). Extrinsic motivation

is also found to be the most immediately influential orientation affecting situational behaviour (Guay et al. 2000). Whilst this seems to contradict most literature which suggests an overall focus in intrinsic motivation is more beneficial (Vansteenkiste et al. 2004), to increase effort during a situation, introduction of an extrinsic goal has been found to have an immediate effect through increasing effort although not necessarily enhancing performance (van de Pol et al. 2012).

Intrinsic, extrinsic and amotivational profiles may be sufficiently powerful to predict behaviour at the contextual and global levels (Vallerand and Bissonnette 1992), although where situational demands are perceived as intense and influential, a usual trait-like response may not be seen (Sniehotta et al. 2005; Gallo et al. 2009). Individuals who are uninterested in an activity demonstrate high levels of amotivation which are overcome by enhancing situational intrinsic and extrinsic motivation, thus helping to develop personal interest in that activity (Chen and Hancock 2006). However, whilst it is not clear whether situational motivation mentioned by Chen and Hancock (2006) refers to intrinsic or extrinsic motivation, immediate success in performance is found to enhance motivation for future performance and related activities creating a positive spiral (Mata et al. 2009).

### **2.11.3 Motivational profile**

Many theorists are suggesting that combining both intrinsic and extrinsic motives are an ideal balance for individual motivation as they can focus on extrinsic reasons for participation and achievement when the individual perceives intrinsic motives as absent (Beaudoin 2006).

Conceptualising intrinsic and extrinsic motivation as independent orthogonal constructs may distinguish unique motivational patterns across individuals (Moreira et al. 2002). The identification of optimal or suboptimal motivational profiles for performance would need to take into account the individual personality characteristics as well as the situational demands. As a general framework an ideal motivational profile would consist of high quality of motivation, comprising intrinsic and some of the more self-determined forms of extrinsic motivation, or a high quantity of motivation, which may include both intrinsic and extrinsic factors (Vansteenkiste et al. 2009). A profile approach assessing both type and intensity of motivation at a situational level could provide unique information which may be lost when measuring motivation from the contextual or global levels (Ullrich-French and Cox 2009) due to the amalgamation of data in order to provide a more generic contextual or global motivational profile.

## **2.12 Measuring motivation**

Measuring an intangible concept such as motivation can be challenging (Robinson et al. 2005). In previous literature review sections, there are many different and complex combinations of intrinsic and extrinsic motivations interacting across the different levels of the HMIEM, making the measurement of motivation complex (Barkoukis et al. 2008). Furthermore, Faye and Sharpe (2008) suggest that to fully explain the multiple facets of motivation the direction and intensity or quality and quantity of motivation also needs to be measured. Motivation is such a broad topic that measurement may be more reliable if similar concepts are categorised into recognisable and manageable components (De Raad and Schouwenburg 1996) which would then provide a foundation for the numerous valid and reliable psychometric measures of motivation. However, some measures tend to focus on only one category, for example the Intrinsic Motivation Inventory, which provides limited insight into the broad construct of motivation and cannot fully explain the variance between extrinsic and intrinsic motives (Vallerand and Bissonnette 1992). The aim of this section is to analyse the existing methods of measuring motivation, and in particular situational motivation, in order to ensure the most appropriate measure is utilised.

### **2.12.1 Subjective measurement**

The measurement of motivation regularly uses various psychometric instruments which are administered prior to training, competition or other formally structured and related activity (Recours et al. 2004). Maslow (1970) recommends identifying and interpreting fundamental goals to enhance the measurement of motivation, rather than listing motivational drives. Individuals would also need to clarify how important they feel the task is to them, how interested they are in the task and their perception of the context in which the task is set (Vallerand and Bissonnette 1992). Collecting this additional perspective enables researchers to assess the specific cognitive and affective operations related to motivation for each situation (Robinson et al. 2005). This will be an approach adopted in studies 2, 3 and 4 only as study 1 focuses on generic more contextual motives and global personality traits thus there is no focus on a specific task.

Observing motivation is a difficult method for accurate interpretation of motivation as the observer is only watching the activity as an end product and cannot see the underlying reasons behind the performance or the value the individual associates with the activity (Reiss 2005). The observer interprets and translates observed data according to their own values and understanding which could falsely allocate specific individual motives (Reiss 2005). It may be that an ethnological approach, such as observation, triangulated with additional measures may provide

a more accurate understanding of motivation (Cotton et al. 2010; Erickson et al. 2011). However, observing motivation in a situational context is not the focus of this thesis and therefore this method will not be employed.

### **2.12.2 Psychometric instruments**

Psychometric measures focussing on the tenets of SDT, generally encompass multiple, broad constructs such as intrinsic motivation, extrinsic motivation and amotivation. From these measures subscales can be differentially summed to assess levels of autonomy and self-determination (Hart et al. 2007; Faye and Sharpe 2008; Ullrich-French and Cox 2009; Vansteenkiste et al. 2009). Amalgamating subscales into broader categories may result in some of the raw subscale data (e.g. intrinsic motivation to know, extrinsic motivation for introjected regulation) being hidden from the final analysis (Faye and Sharpe 2008). Also averaging situational motivation data over a period of time in order to report contextual motivation would obscure actual motivational changes within each situation. However, adopting an additive approach, such as when calculating the quality and quantity of motivation, rather than using averages may highlight important aspects of motivation or motivational change within activity (Ullrich-French and Cox 2009; Vansteenkiste et al. 2009).

Some research has utilised a self-determination index (SDI) rating to explain motivational differences across activities. This method used to calculate the SDI, relies on application of weightings for some subscales and then subtracting one motivation score from another. The equation would look like:  $[(2 \times \text{intrinsic motivation}) + (\text{identified regulation}) - (\text{introjected regulation}) - (2 \times \text{external regulation})]$  (Standage et al. 2006; Ullrich-French and Cox 2009). These methods of calculating motivation data have been used mainly on the Sports Motivation Scale (SMS; Pelletier et al. 1995), although other scales designed to measure self-determined motivation (e.g. Academic Motivation Scale; AMS-C 28 Vallerand and Pelletier 1992) utilising the principles from SDT have used similar calculations to assess contextual motivation.

The Sports Motivation Scale (SMS; Pelletier et al. 1995) is a commonly used measure which assesses intrinsic motivation, extrinsic motivation and amotivation at a contextual level of generality, according to the HMIEM. The SMS does not pre-empt a specific intrinsic or extrinsic orientation but instead appraises the individual's motives for the activity in which the individual usually participates (Shaw et al. 2005; Beaudoin 2006). There is some discussion in the literature concerning items on the three intrinsic motivation subscales, suggesting these subscales are not differentiated enough and could be amalgamated into one subscale (Martens

and Webber 2002; Shaw et al. 2005; Mallet et al. 2007). However, SDT defines intrinsic motivation differently for each of the three categories; intrinsic motivation to know, to accomplish and to experience stimulation (Deci and Ryan 2000; 2008). Therefore, combining these constructs could lead to a misinterpretation of intrinsic motives.

Further problems with the SMS were revealed in a study for Masters' athletes where some of the amotivation items loaded onto intrinsic motivation subscales but were interpreted as reflecting the athletes' uncertainty about continued participation at such a high level (Shaw et al. 2005). This loading of amotivation on to some intrinsic motivation subscales may be indicative of the complex associations and interactions between hierarchical levels (Wilson et al. 2003), or due in part to the subtle differences in defining some intrinsic and extrinsic constructs. However, this loading effect may be due to the timing of the measure. The Master's athletes completed the SMS whilst they were attending a competition thus the progress towards their goals at the time of completion may have been in different stages for each athlete thereby influencing their responses to the SMS (Shaw et al. 2005). Despite some discrepancies within the literature, the SMS is still accepted as a valid measure assessing motivation at the contextual level of generality (Martens and Webber 2002).

Additionally, through the development of the hierarchical model of intrinsic and extrinsic motivation, Guay et al. (2000) developed a situational measure of motivation called the Situational Motivational Scale (SIMS; Guay et al. 2000). The SIMS adopts an amalgamated subscale for intrinsic motivation, citing the necessity for reduced items, and omits the introjection subscale. This process of reduction results in a 16-item measure including intrinsic motivation, extrinsic motivation for identified regulation, extrinsic motivation for external regulation and amotivation subscales (Guay et al. 2000). Further analysis of the SIMS by Standage et al. (2003) suggests that motivation at the situational level uses complex and diverse processes which may not be fully explained solely through a general measure of motivation. However, whilst the SIMS is a specific situational measure of motivation and because situational motivation has not been the main focus of motivational research, there is little evidence that this measure assess situational motivation accurately.

Many authors agree that the measurement of situational motivation should occur longitudinally within the activity, to assess trends and changes in motivation (Kavussanu and Roberts 1996; Gernigon et al. 2004; Hein and Hagger 2007; Standage et al. 2008). This repeated measurement is shown to be effective in enhancing reliability of data, particularly where more than one



instrument was used to measure the same construct (Steyer et al. 1999; Deponte 2004). Situational variables and the ensuing influence on the individual can complicate the measurement process, as individuals actively seek out situational cues to confirm or dispute current cognitive and emotional states (Lu 1999). It could be argued that all measurement is situational by nature as it is collected in situations at a single point in time, thus results are also influenced by the effects of the situation on the person at the time of measurement (De Raad and Schouwenburg 1996; Steyer et al. 1999). However, Judge and Ilies (2002) suggest that in order to gain a high level of validity, global measures should be taken in a cross-sectional manner as the situational approach may include too much error at each point of measurement. Furthermore, ascertaining motivational change over time and attributing this to specific reasons or events is complex and may lead to more confusion and contradiction (Baird et al. 2006). In addressing this difficulty for situational measurement, this thesis will firstly identify important situational factors which could be considered to influence situational motivation and then explore the processes of how these factors interact with motivation at the situational level.

### **2.12.3 Self-response distortion**

Using predetermined instruments to measure motivation may lead individuals to answer a question in an expected manner. This could be due to the individual recognising the cultural value of the item (Schmalt 2005), or because the prescribed questions do not seem to accommodate the individual's interpretation of their motives, therefore they respond in line with the subscale items (Patten 2003). Additionally, where individuals realise the measure is about motivation, they recognise it is generally good to have high levels of intrinsic motivation and therefore their responses reflect this even though they may not experience it (Westenhofer et al. 2004). Furthermore, depending on when the measure was administered, the individual may be providing a short-term only or long-term only response to questions (Patten 2003). However, these responses may also occur because of the complex processes relating to motivation which may confuse an individual's understanding of their own motivation. If individuals do not know how they are motivated they may find difficulty expressing this to others and may therefore select what they believe to be an appropriate response (Hardy and Gustavo 2005; Robinson et al. 2005). However, individuals know what they are currently attending to, they can identify physiological sensations and they can interpret this in the light of unique historical facts about themselves to guide future desires and decisions. Therefore, self-report measures are a valid and useful mechanism for collecting situational data (Haefel and Howard 2010), despite the predicted shortcomings described above.

#### **2.12.4 Objective measurement**

Objective measures of these cognitive and affective processes include heart rate (HR) and heart rate variability (HRV) which records the R-R interval as it changes with increased levels of stress (Gendolla and Krüsken 2002; Ruiz-Padial et al. 2003; Westenhoefer et al. 2004). The R-R variability however, decreases under conditions of effort and when individuals suffer excessive stress or burnout effects (Ruiz-Padial et al. 2003; Westenhoefer et al. 2004). As HRV is seen to become less variable with effort this somewhat precludes its use in a physical activity or sport setting; once the participant begins exercise HRV will decrease not necessarily denoting emotional change but more likely reflecting physiological effort. However, HRV could be used pre- and post-activity bouts to determine effects of activity then relating these to emotional response thus providing additional objective measures of individual affective status.

Heart rate as a frequency measure has been used to measure physiological arousal and effort, which can be important in understanding fluctuations in behaviour. For example, those in an autonomous motivation environment reported consistently higher effort measured as percentage of maximum HR, than those in a controlled condition (Banting et al. 2011). However, changes in HR can be linked with many other performance factors such as hydration status (Lopez et al. 2011), training status (Vuori 1998; Hofmann and Pokan 2010), and psychological status (Cumming et al. 2007). Changes in HR can be monitored by the individual as biofeedback and can be considered part of a self-regulatory system altering interpretation of demands and subsequent behaviour to enhance performance (Appelhans and Luecken 2006; Wilson et al. 2006). This thesis proposes to measure situational motivation processes during activity in sport and exercise settings. Anecdotal discussions with sports physiologists about using HR and HRV measures prior to data collection, were persuasive in questioning the value of using these measures to investigate situational motivation.

#### **2.13 Summary of literature review**

Motivation at the situational level of generality may operate differently to contextual or global motivation. The overriding factors for consideration of situational motivation processes are the individual's trait cognitive and affective responses and the influence of environmental demands (Steyer et al. 1999; Elliot and Thrash 2002; Baird et al. 2006). Extroversion and neuroticism are suggested to be the main personality traits which relate directly to performance motivation (Zuckerman et al. 1993; Ackerman and Heggstad 1997; Olson and Weber 2004; Robinson et al. 2005; Mor et al. 2008) and furthermore, these trait characteristics can change gradually over a period of time where an individual experiences many similar situations (Baird et al. 2006).

The first study in this thesis will measure personality traits and motivation to assess the impact of personality traits on reported motivation. Different situations may require unique responses and therefore, the individual will need a mixture of strategies and processes in order to cope with the specific demands (Bindarwish and Tenenbaum 2006). Perceived situational demands may act as a stimulus for emotion, which in turn influences the cognitive and affective response (Reich et al. 2003) as predicted by SDT (Deci and Ryan 2000; 2008). However the resulting behaviour may then cause the individual to revise the perceived demands for the very next part of the activity, immediately influencing the various processing systems culminating in variable or consistent performance behaviour. Studies 2, 3 and 4 of this thesis will include measures of affect in order to ascertain levels of positive and negative affect in addition to a specific situational motivation measure.

Positive affect is linked with adaptive coping and self-regulatory strategies (Gendolla and Krüsken 2002) and extroversion (Bakker et al. 2006; Luhmann and Eid 2009; Ng and Diener 2009). In contrast, negative affect is generally related to maladaptive coping strategies (Pushkar et al. 2002; Robinson and Tamir 2005) and felt more intensely than positive affect (Otani et al. 2007). However, it may be that negative affect is required in order to initiate goal-orientated performance where a current evaluation of performance identifies required changes to meet future performance expectations (Carver and Scheier 1982; 2002; vanDellen and Hoyle 2008). Where activity is initiated under conditions of negative affect, as the individual monitors feedback and perceives positive progress towards a goal, this negative perception may change (Linnenbrink and Pintrich 2002; Hardy and Gustavo 2005; Sutin and Robins 2005; Smith 2006).

Affect, behaviour and cognition may play a dual role in situational motivation, i) as a consequence of motivation (Deci and Ryan 2000; 2008) and ii) in the short temporal sequencing of situational motivation acting as an antecedent or mediator of subsequent motivation (Linnenbrink and Pintrich 2002; Turnbull and Wolfson 2002; Covassin and Pero 2004). Additionally, success and failure perceptions may elicit different responses based on the individual's personality traits (Levesque et al. 2008) and an interpretation about competency, benefits and costs of continuing to pursue goals in the current situation (Araújo et al. 2005). Increasingly, researchers are finding that performance and progress information is received from a range of sources, including both intrinsic and extrinsic approaches, and that individuals who can use multiple strategies demonstrate consistently better performance across a range of situations (Covington 2000; Steinberg et al. 2000; Merkle et al. 2002; Tauer and Harackiewicz 2004; Bailis et al. 2005; Hollombeck and Amorose 2005; Vansteenkiste et al. 2006). Studies 3

and 4 will measure situational motivation in combination with affect, goal data and perceptions of goal progress in order to explore situational motivation processes.

Motivational profiles and motivational intensity may be good indicators of optimum performance and will be used in all studies for this thesis to assess the beneficial effects of situational motivation. Measuring these motivational profiles occurs through psychometric instruments, collecting responses to pre-determined and structured items derived from theoretical constructs (Hart et al. 2007; Faye and Sharpe 2008; Ullrich-French and Cox 2009; Vansteenkiste et al. 2009). However, motivation information can also be ascertained from other sources such as goal information (Maslow 1970; Vallerand and Bissonnette 1992; Reiss 2005), volitional participation in additional unstructured activity (Recours et al. 2004), or through a more objective physiological response such as HRV (Gendolla and Krüsken 2002; Ruiz-Padial et al. 2003; Westenhoefer et al. 2004). Triangulation of measurement processes may provide a clearer and more detailed comprehension of situational motivation (Cotton et al. 2010; Erickson et al. 2011). The investigation of motivation as a situational construct may be more credible if opportunities were provided for participants to explain the meaning for their responses (Hareli and Weiner 2002; Lane et al. 2005; Hannula 2006). Possible methods might include cognitive and affective reporting along with interpretation of goal progress and achievement. This could also provide a basis for linking more than one process or construct at the situational level of motivation (Hareli and Weiner 2002; Hannula 2006). Participants in studies 2, 3 and 4 will be given opportunities to provide goal setting and progression data along with additional information about how they feel, in an attempt to gather more credible data for this thesis.

Motivation to achieve a goal or avoid an unpleasant outcome is vital in stimulating behaviour for an activity (Deci and Ryan 2008; Ewen 2010). Goals are generally set within a task-mastery or ego-performance framework, and can be influenced by situational demands (Mallet 2005), team or group environment (Downie et al. 2006) and perceived motivational climate (Reinboth and Duda 2004). During an exercise situation, individuals with more experience can utilise intrinsic motivation as a situational drive more effectively (Recours et al. 2004). Although complex and subtle differences between intrinsic motivation and more self-determined forms of extrinsic motivational regulations such as introjection, can provoke feelings of guilt and shame if exercise is not undertaken (Wilson et al. 2003; Thøgersen-Ntoumani and Ntoumanis 2006). However, in a sports situation due to increased opportunities for normative comparison, extrinsic motivation can increase levels of anxiety (Smith et al. 2006a). Although, the task orientated nature of skill progression favours adoption of a task orientation and reliance on more

intrinsic processes (Ryska 2002a; Spray et al. 2006). Thus a combination of intrinsic-extrinsic and task-ego goals and orientations are purported to be necessary for good performance in an active situation (Martens and Webber 2002; Biddle et al. 2003). Whilst it is not anticipated that participants categorise their own goal data into these specific orientations, the data collected may enable a retrospective assessment of goal type for studies 2, 3 and 4 by the researcher.

Personality traits must also be considered within situational measurement as the trait responses will influence the situational response and exposure to similar situations will influence the trait response over time (Lu 1999; Steyer et al. 1999; Baird et al. 2006). Intense and stimulating situational demands may override the individual's trait like response, causing affective changes which can produce unpredictable behaviour (Koestner et al. 1989; Efklides 2011). Self-regulatory processes are important in controlling and guiding performance behaviour during activity in relation to feedback from goal progress and other sources (Deci and Ryan 2000; Gernigon et al. 2004; Efklides 2005). Thus goal setting becomes an important part of the self-regulatory process for performance where both goals set and perceived progression towards those goals will alter according to affective state (Smith 2006; Shell and Husman 2008). At the situational level of generality according to the HMIEM, motivational processes may rely on different antecedents than for the contextual or global levels (Linnenbrink and Pintrich 2002; Hardy and Gustavo 2005). It may be more important at the situational level, that the motivational orientations include both intrinsic and extrinsic strategies (Merkle et al. 2002; Bailis et al. 2005). Measurement of motivational constructs has been recognised as challenging (Barkoukis et al. 2008; Faye and Sharpe 2008). However, a number of psychometric instruments have been validated and widely used in motivational research (Hart et al. 2007; Ullrich-French and Cox 2009), although these focus on the contextual level of motivation and only the SIMS (Guay et al. 2000) addresses situational measurement of motivation. The studies in this thesis intend to use the previously validated SIMS (Guay et al. 2000) as a specific measure of situational motivation which is also grounded in SDT.

## **2.14 Research Questions**

Based on the findings of this literature review, the following research questions will be explored through the studies in this thesis.

- Does personality type influence motivational profiles?
- Does situational motivation fluctuate during the course of an activity?
- Do motivational profiles predict performance? Does goal progress affect post session motivation?
- Does motivational intensity predict performance? Do those who demonstrate high motivational intensity finish in the top half of the competition?

More specifically, the studies in this thesis will further test specific hypotheses regarding situational motivation in relation to the overall thesis aims and the above research questions.

Study 1 How motivated are you? Exploring the differences between motivational and personality profiles addresses the research question, ‘does personality type influence motivational profiles?’

Study 2 Temporal short-term situational change in motivation for experienced and less experienced Pilates participants addresses the research question, ‘does situational motivation fluctuate during the course of an activity?’

Study 3 Situational motivational processes during cycling time trial performance addresses the research questions, ‘Do motivational profiles predict performance? And does goal progress affect post session motivation?’

Study 4 The moment-by-moment nature of situational motivation in a mixed-pairs badminton tournament: Which comes first, how you feel or what you did? This study addresses the research questions, ‘does motivational intensity predict performance? Do those who demonstrate high motivational intensity finish in the top half of the competition?’

## **3.0 Study 1: How Motivated Are You? Exploring the Differences in Motivational Profiles and Personality Types**

### **3.1 Introduction**

Personality variables have consistently been found to predict behaviours and outcomes (Ones et al. 2005). A complex interaction between personality characteristics and the situation, may also predict general motivation (Hong and O'Neil 2001; Bakker et al. 2006). Although there is currently no identified general sports personality (Reiss et al. 2001; Lochbaum et al. 2007) it may be that individual athletes demonstrate a predominant motivational style (Deponete 2004). Motivation focuses on an individual's desire for their goals, whereas personality relates to processes and priorities of drives in achieving outcomes (Olson and Weber 2004). Many athletes have similar goals, but each individual may undertake the achievement process differently in accordance with their personality characteristics. Thus athletes demonstrate relatively stable motivational orientations linked to these personality characteristics which could be unique across individuals (Deponete 2004; Tamir 2005).

Self-determination theory (SDT) is a robust and commonly used motivational theory within the sport and exercise domain (Deci and Ryan 2008; Teixeira et al. 2012). The concepts of SDT were further extended through the hierarchical model of intrinsic and extrinsic motivation (Vallerand 2000) to show motivational processes at three hierarchical levels. The global level of motivation is thought to influence both the contextual and situational motivation in a top-down effect (Lavigne et al. 2009). According to an individual's causality orientations and internal or external reliance, global motives generally lead to global outcomes including life-satisfaction or long-term specific outcomes (Vallerand 2000; Ryska 2002). These dispositional motivational factors combined with specific personality types may form identifiable motivational profiles across personality groups.

A key concept for SDT is the satisfaction of three innate psychological needs which can affect the individual's perception of themselves: namely autonomy, competence and relatedness (Ntoumanis 2001; Deci and Ryan 2008; Sheldon and Filak 2008; LaGuardia 2009). It is during the process of satisfying these needs that self-determined behaviour is observed (Faye and Sharpe 2008). There are recognised distinctions between intrinsic and extrinsic motivation within SDT (Ingledeew et al. 2004) where intrinsic motives reflect a desire for knowledge and stimulation and are the most self-determined forms of motivation (Markland and Tobin 2004;

Lonsdale et al. 2009). Extrinsic motives focus on performance outcomes, avoiding negative affective outcomes and social pressures and are generally less self-determined (Barkoukis et al. 2008; Assor et al. 2009). A third concept of motivation according to SDT, is amotivation which occurs when individuals do not value the behaviour and feel they are wasting the effort required to complete the activity (Ryan and Deci 2000; Gillet et al. 2009).

Introversion-extroversion and neuroticism-stability are the most widely recognised broad personality constructs originating from Eysenck's (1985) work on personality types within a three-factor construct which also included psychoticism. More recently Goldberg (1999) developed a five-factor approach to personality types which includes both introversion-extroversion and neuroticism-stability dimensions, along with agreeableness, conscientiousness and open mindedness. There is more evidence to support the three factor approach to personality traits and the extroversion-introversion and neuroticism-stability continua are the most prevalent (Mor et al. 2008). Introverted individuals have higher levels of non-specific arousal than extroverts (Gomez et al. 2002; Baird et al. 2006). These high arousal levels combined with an introspective approach suggests that introverts internalise values and motives for an activity more easily than extroverts (Henjum 1982; Geen 1984; Opt and Loffredo 2003). Introverts have also been found to set reasonably high goals, although they follow a more structured and organized approach to achieving these than extroverts (Morossanova 2003). Furthermore, introverts are thought to have higher levels of satisfaction than extroverts (Elliot and Thrash 2002; Olson and Weber 2004) which aligns with the process orientated, internally directed and self-determined approaches related to intrinsic motivation (Vlachopoulos et al. 2000). Therefore, introverted athletes are expected to show significantly higher levels of intrinsic motivation than extroverted athletes.

The outgoing, sociable and adventurous behavior of the extrovert (Bakker et al. 2006; Hart et al. 2007) may reflect motivational orientations focusing on external factors. The influence of other's perceptions about an individual's level of competence creates pressure to avoid feelings of guilt and shame (Gillet et al. 2009) or enhance feelings of self-worth (Assor et al. 2009). These typical outgoing tendencies make it difficult for the sports extrovert to rely solely on intrinsic motivational orientations, as they are less able than introverts to internalise previously external values into their own self-beliefs (Deci and Ryan 2008; Faye and Sharpe 2008). The sports extrovert sets challenging goals where positive affect is part of the achievement outcomes and this is generally combined with a predisposition to select appropriate coping strategies, (Tamir 2005; Luhmann and Eid 2009).



Unpredictable behaviour and increased negative affect are characteristics of the highly neurotic individual who also has tendencies to select maladaptive coping strategies (Furnham and Christoforou 2007). Similar to the extroverted individual, high levels of neuroticism have also been associated with high levels of motivation and drive (Robinson and Tamir 2005), although this tends to have an extrinsic focus at the expense of intrinsic factors (Judge and Ilies 2002; Tamir 2005). Dissimilar to extroverts, the neurotic athlete is more willing to sacrifice some short term gains in order to achieve longer term goals (Pushkar et al. 2002; Tamir 2005). However, there is also a tendency to set extremely high but unrealistic goals which may lead to performance dissatisfaction (Judge and Ilies 2002; Bakker et al. 2006) and ultimately an amotivated state (David 2010).

It is likely that personality traits precede or affect motivation through the individual's perceptual and cognitive processes, including interpretation of relevant situational information, prior to deciding a course of action (Lounsbury et al. 2005; DeYoung et al. 2008). The sports introvert is expected to report higher levels of intrinsic motivation than the sports extrovert due to their more introspective and structured approach. The characteristics of the sports extrovert suggest they will be seeking more stimulating situations to enhance their low levels of non-specific arousal and this demand for stimulus could manifest as higher levels of total motivation, compared to the sports introvert, drawing on both intrinsic and extrinsic motivation. The neurotic athlete is largely unpredictable and it is expected that performance dissatisfaction associated with unrealistic goals will lead neurotic athletes to report higher levels of amotivation than stable athletes.

The aims of this study were to assess differences in motivation profiles between athletes across a range of personality types. Assessing overall levels of introversion-extroversion or neuroticism-stability is considered to be a valid method for interpreting trait response (Linden 1970; Jessup and Jessup 1971; Eysenck 1985). However, combining these continua to form a two-dimensional approach to personality is also an acceptable protocol (Eysenck and Eysenck 1964) and may provide additional insight regarding differences in motivational profiles for these personality groups. Therefore, this study will also categorise personality traits by stable-extrovert, stable-introvert, neurotic-extrovert and neurotic-introvert. It was hypothesised that i) stable-extroverted sports people will exhibit the highest quantity of overall motivation as they seek to fulfil their high drive for stimulating situations, ii) stable-introverted sports people will report higher levels of intrinsic motivation than their extroverted counterparts, iii) stable-

introverted sports people will report lower levels of extrinsic motivation than their extroverted counterparts and, iv) neurotic-introverted sports people will report the highest levels of amotivation compared to other personality groups.

## **3.2 Method**

### **3.2.1 Design**

The difference in motivation profiles and personality types of sports participants was investigated using a cross sectional design consisting of a convenience sample measured at a single time point. All participants were currently active in sport and exercise although they were approached at the same time to complete the measures which was not immediately prior to or post-performance.

### **3.2.2 Participants**

University ethical procedures were completed and approved for this research. The sample consists of students thus it was approved that the data was collected at a time that was not intrusive to the academic demands on the students, i.e. after students were dismissed from lectures. Questionnaires were collected in large groups by students ensuring that individual students who did not wish to participate were not identified during the data collection by the tutors or other students. Participants (n=239) were male and female university students (age 18-53 years) on the first year of a sports related degree programme. Questionnaires and demographic information were not completed fully throughout the survey and of 117 participants who completed the demographics, female (n=39) and male (n=80), mean age 20.34 years (SD 5.52). All participants were involved in regular sport or exercise activities at various levels ranging from recreational through to County level performers and engaged in their activities at least 3 times per week. An example of the types of sports and activities undertaken by participants include but are not limited to: football, netball, hockey, rugby, climbing, cycling, rowing, weight lifting, running and gymnastics.

### **3.2.3 Procedure**

An adapted version of Eysenck's Personality Inventory (EPI; Eysenck and Eysenck 1964) and the Sports Motivation Scale (SMS; Pelletier et al. 1995) were administered to a group of first year university sports students in a situation unrelated to sport. Four groups of students were asked to complete the measures at the end of their lectures once students had been dismissed by the tutor. The completion of measures occurred in large lecture groups and students were given

instructions to put down their first response and not to think too long on each question, as their first response would be the most accurate. Participants were encouraged to think about their own responses and not to look at others' or compare answers. The questionnaires were distributed in counterbalanced order where 2 groups completed the EPI (Eysenck and Eysenck 1964) followed by the SMS (Pelletier et al. 1995) and 2 groups completed the SMS (Pelletier et al. 1995) then the EPI (Eysenck and Eysenck 1964) to avoid order effects. Participants were informed that confidentiality and anonymity would be maintained. Not all questionnaires were completed fully (n=289) and where this was the case their results were not included with the final number of participants, n=239.

### **3.2.4 Instrumentation**

#### **Adapted Eysenck's Personality Inventory (EPI; Eysenck and Eysenck 1964).**

The Eysenck Personality Inventory (EPI; Eysenck and Eysenck 1964; Eysenck 1985) is used in the assessment of relatively independent personality dimensions and was constructed through analysis of over 30 000 participant responses (Linden 1970). The adapted EPI used in this study, consisted of two 10-item scales relating to extroversion-introversion (E) and neuroticism-stability (N) subscales. Responses are simply *yes* or *no* to each question. The adapted EPI uses original items from the EPI, for example, '*do you often get "butterflies in your tummy" before an important occasion?*' and '*do you find it hard to fall asleep at bed time?*' Internal consistency of the original EPI ranges from -.09 (E) and -.22 (N) (Linden 1970). Findings support the construct validity of the EPI (Platt et al. 1971) and external correlations with reliable scales range from .79 to .92 (Linden 1970). Internal reliability for the adapted EPI used in this study resulted in Cronbach alpha levels of .46 (E) and .29 (N).

Francis and Jackson (2004) and Aluja et al. (2003) suggest that selecting items from the primary subscales (E and N) to create shorter versions of the original measure is acceptable practice and demonstrated alpha co-efficients of at least .70 The reliability scores for the adapted EPI used in this study were lower than these, however they were higher than the original EPI scores reported above. Additionally removal of the lie scale also reduced the total number of items and self-response distortion information was used to control the influence of social desirability (Sato 2005).

#### **Sports Motivation Scale (SMS; Pelletier et al. 1995).**

The Sports Motivation Scale (SMS; Pelletier et al. 1995) was developed within the tenets of self-determination theory to identify and assess levels of intrinsic motivation, extrinsic

motivation and amotivation (Pelletier et al. 1995). The SMS is a self-report measure consisting of 28 items corresponding to 7 subscales from the stem 'why do you practice your sport?' The 7 subscales are divided unevenly between intrinsic motivation (intrinsic motivation to know; intrinsic motivation to achieve and intrinsic motivation to experience stimulation) extrinsic motivation (identified regulation; introjection and external regulation) and amotivation (amotivation). The responses are reported on a 7 point Likert scale (*1=does not correspond at all; 7=corresponds exactly*) and each subscale encompasses 4 items. The SMS is a validated scale with reliability and validity scores ranging from .70 to .82 (Cronbach  $\alpha$  levels) and a mean alpha coefficient equal to .75 (Martens and Webber 2002). Furthermore, there were high, positive correlations between factors within both the intrinsic and the extrinsic subscales indicating similar but not identical constructs (Martens and Webber 2002). Internal reliability for the SMS in this study produced Cronbach alpha co-efficients ranging from .67 (extrinsic motivation for identified regulation) to .82 (intrinsic motivation to know).

### **3.2.5 Data analysis**

Data in this study were initially divided by extrovert-introvert scores using a median split where higher scores denote extrovert behaviour and lower scores are classified as introverted behaviour (Jessup and Jessup 1971; Hollis et al. 2007). The range for introverted classification was 2 – 6 and for the extroverted group 7 - 10. Support for this process of classification is provided in Kirkcaldy (1980) who used similar processes to classify personality data on these continua. However, in more recent times there have been discussions around individuals who may demonstrate characteristics of both low and high groups for the traits investigated, for example, ambiverts are thought to show a combination of introverted and extroverted behaviours (Cohen and Schmidt 1979). Platt et al. (1971) and other authors of personality research (e.g. Jessup and Jessup 1971; Howarth 1976) using a range of personality measures, refer to high or low Extroversion and high or low Neuroticism, there is little indication of the range of scores these groups denote. Therefore, the groups in this study were divided into low, medium and high scores through a process of equally dividing the scores into 3 ranges. These were confirmed as significantly different groupings using a one-way ANOVA; extroversion ( $f = 603.99, df = 2, p = 0.000$ ), neuroticism ( $f = 378.62, df = 2, p = 0.000$ ). Data analysis i) initially assessed all 7 SMS subscales, ii) then the SMS motivation data was collapsed into intrinsic motivation, extrinsic motivation and amotivation which is considered a valid method for reporting motivation data (Hart et al. 2007), and finally generated measures of iii) quality of motivation and iv) quantity of motivation (Vansteenkiste et al. 2009). Good quality motivation

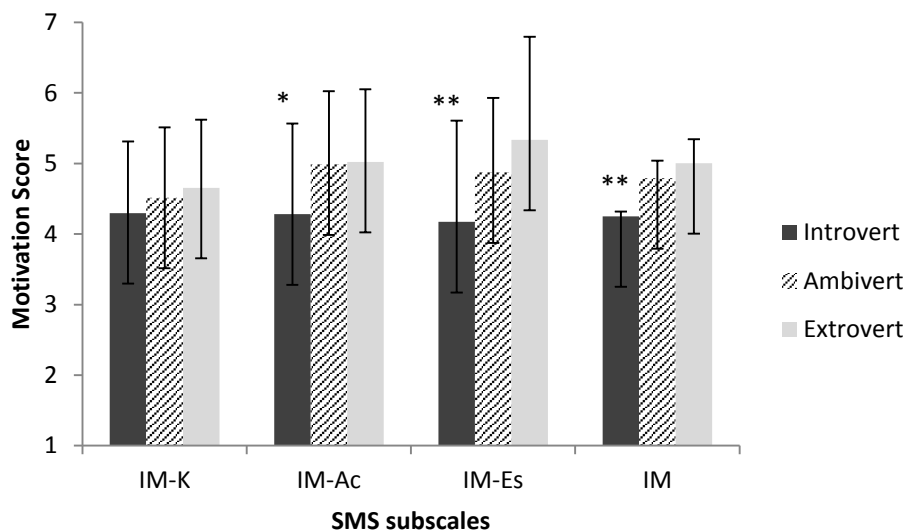
is defined as highly autonomous and includes a cumulative addition of the 3 intrinsic motivation subscales and extrinsic motivation for identified-regulation, being the most self-determined form of motivation (Lavigne et al. 2009). Quantity of motivation relates to overall motivation and is represented by the sum of all 3 intrinsic subscales and all 3 extrinsic subscales (Vansteenkiste et al. 2009). Using IBM SPSS version 22 software, non-parametric Mann-Whitney *U* tests were applied to assess intrinsic motivations, extrinsic motivations and quantity of motivation between the introverted, ambiverted and extroverted athletes; results were accepted at the 0.05 level of significance. Introverted athletes were represented by low scores on the extroversion subscale (range 2-4,  $n = 16$ ), ambiverted athletes related to the mid-range scores on the extroversion subscale (range 5-7,  $n = 88$ ) and extroverted athletes were those who reported high scores on the extroversion subscale (range 8-10,  $n = 135$ ). Data were then divided by neuroticism where low scores on the neuroticism subscale equate with stability and high scores denote neuroticism (Hollis et al. 2007). The stable-neurotic classification was carried out similarly to the introvert-extrovert classification above. Whilst there is no specific mention or reference to a middle range personality type on the neuroticism scale, Friedman (2000) suggests a positive and negative neurotic trait, however, this is an interpretation of valence with high scores on the neuroticism subscale. Nonetheless scores on the neuroticism scale were divided into 3 groups where neurotic athletes ( $n = 31$ ) were those who scored highly on neuroticism subscale (range 8-10), the middle range group were included but not labelled and they were the largest group in this sample ( $n = 149$ , range 4-7), finally the stable athletes ( $n = 59$ ) scored the lowest on the neuroticism subscale (range 0-3). Parametric one way ANOVA were used to assess differences in amotivation between personality types and results were accepted at the 0.05 level of significance.

The data were finally categorised into four personality groups (neurotic-introvert; neurotic-extrovert; stable-introvert; and stable-extrovert; Eysenck 1951, Eysenck and Eysenck 1964) and motivational differences were tested using a non-parametric independent samples Kruskal-Wallis test. Further *post hoc* analyses were carried out using Mann-Whitney *U* tests on the combined two-dimensional subscales of the EPI and data were accepted at the 0.05 level of significance.

### **3.3 Results**

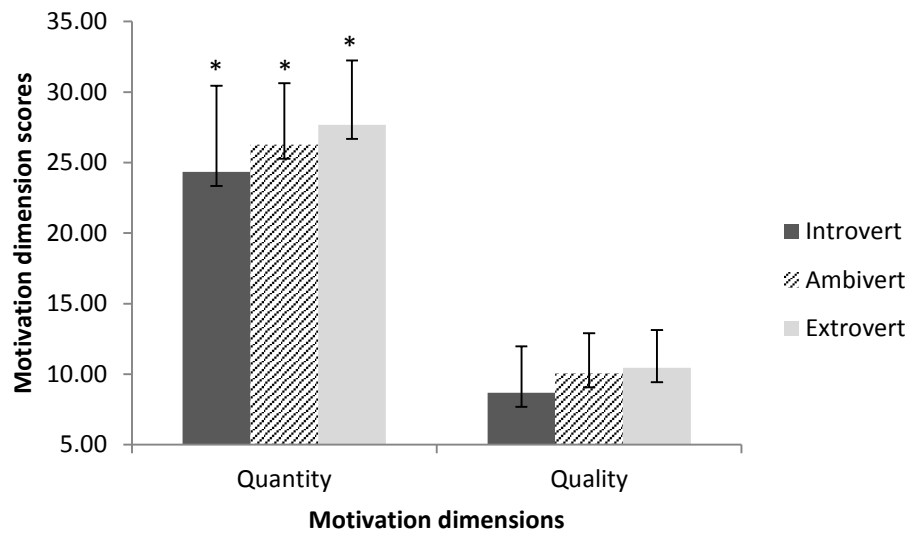
*Post hoc* Tukey analysis revealed that introverted athletes consistently reported significantly less overall intrinsic motivation (IM,  $M = 4.250$ ,  $n = 16$ ,  $p = 0.006$ ,  $F = 5.217$ ,  $df = 2$ ) than extroverted athletes ( $M = 5.004$ ,  $n = 135$ ) and significantly less IM than athletes in the ambivert

group ( $M = 4.793$ ,  $n = 88$ ). Furthermore, the introverted group reported significantly less intrinsic motivation to accomplish (IM-Ac,  $M = 4.281$ ,  $SD = 1.284$ ,  $n = 16$ ,  $p = 0.029$ ,  $F = 3.610$ ,  $df = 2$ ) than both the extrovert ( $M = 5.022$ ,  $SD = 1.031$ ,  $n = 135$ ) and ambivert ( $M = 4.989$ ,  $SD = 1.036$ ,  $n = 88$ ) groups and significantly less intrinsic motivation to experience stimulation (IM-Es,  $M = 4.172$ ,  $SD = 1.434$ ,  $n = 16$ ,  $p = 0.001$ ,  $F = 7.306$ ,  $df = 2$ ) than extroverted ( $M = 5.335$ ,  $SD = 1.463$ ,  $n = 135$ ) and ambivert athletes ( $M = 4.875$ ,  $SD = 1.057$ ,  $n = 88$ , see figure 3.3.1).



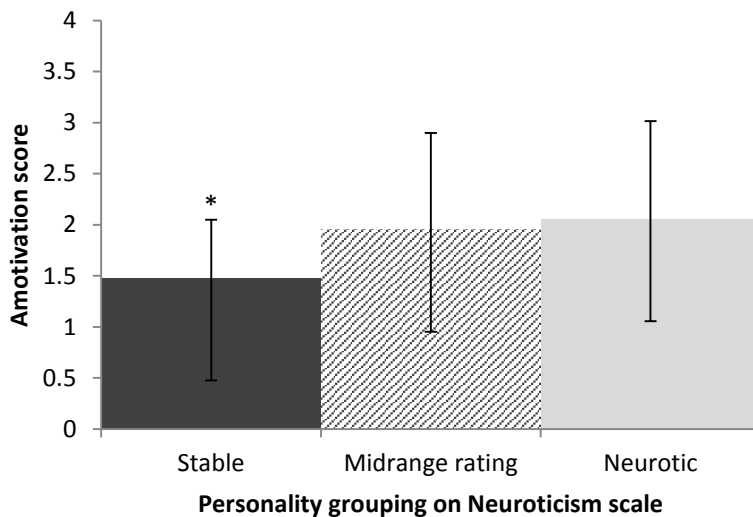
**Figure 3.3.1** Differences between introvert, ambivert and extroverted athletes' levels of intrinsic motivation subscales. IM-K=intrinsic motivation to know; IM-Ac=intrinsic motivation to accomplish; IM-Es=intrinsic motivation to experience stimulation; IM=overall intrinsic motivation. \* $p < .05$ , \*\* $p < .01$

There were significant differences between extrovert, ambivert and introverted athletes for quantity of motivation (Quantity,  $p = 0.006$ ,  $F = 5.249$ ,  $df = 2$ ). *Post hoc* Tukey analysis revealed that extroverted athletes had significantly higher quantity of motivation ( $M = 27.683$ ,  $SD = 4.556$ ,  $n = 135$ ), than both ambiverted athletes ( $M = 26.264$ ,  $SD = 4.374$ ,  $n = 88$ ) and introverted athletes ( $M = 24.344$ ,  $SD = 6.107$ ,  $n = 16$ ). Ambivert athletes also had significantly higher quantity of motivation than introverted athletes. There were no significant differences between groups for quality of motivation (Quality:  $p = 0.053$ ,  $F = 2.966$ ,  $df = 2$ ; Introvert,  $M = 8.688$ ,  $SD = 3.295$ ,  $n = 16$ , Ambivert,  $M = 10.077$ ,  $SD = 2.836$ ,  $n = 88$ , Extrovert,  $M = 10.443$ ,  $SD = 2.680$ ,  $n = 135$ , see figure 3.3.2).



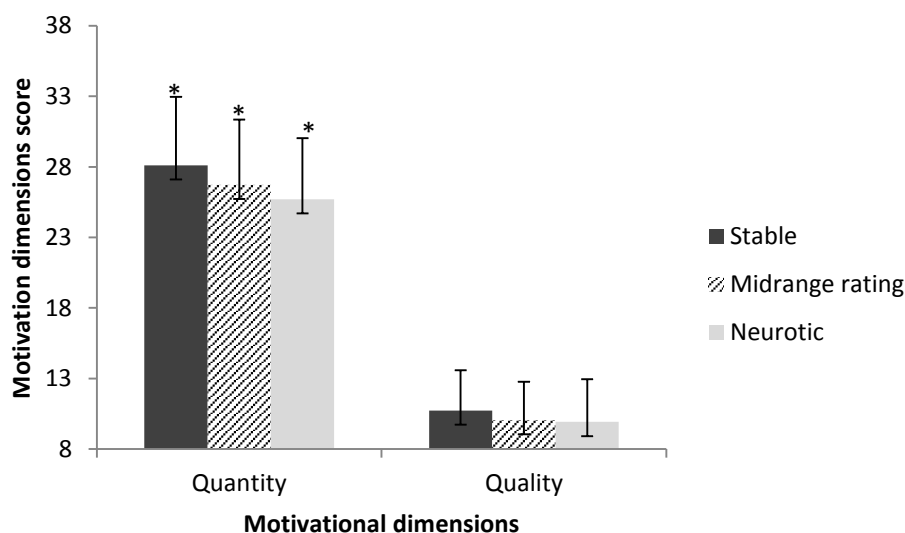
**Figure 3.3.2** Differences between quality (all intrinsic motivation plus identified regulation, SMS subscales) and quantity (all intrinsic plus all extrinsic motivation, SMS subscales) of motivation for introvert and extroverted athletes. \* $p < .01$

Participants were further categorised as neurotic ( $n = 31$ ) or stable athletes ( $n = 59$ ) with a midrange group also identified ( $n = 149$ , see figure 3.3.3). *Post hoc* Tukey findings revealed that the stable athletes reported significantly lower levels of amotivation ( $M = 1.475$ ,  $SD = 0.575$ ,  $p = 0.001$ ,  $F = 7.396$ ,  $df = 2$ ) than either the midrange ( $M = 1.953$ ,  $SD = 0.945$ ) or the neurotic group of athletes ( $M = 2.057$ ,  $SD = 0.959$ ).



**Figure 3.3.3** Difference in Amotivation scores between neurotic and stable athletes, including those reporting a midrange score. \* $p < .01$

*Post hoc* Tukey analysis showed that stable athletes reported significantly higher levels of quantity of motivation ( $M = 28.102$ ,  $SD = 4.871$ ,  $p = 0.048$ ,  $f = 3.081$ ,  $df = 2$ ) than neurotic ( $M = 25.710$ ,  $SD = 4.328$ ) and the midrange athletes ( $M = 26.732$ ,  $SD = 4.618$ ) and the midrange athletes reported significantly higher quantity of motivation than the neurotic athletes (see figure 3.3.4). There were no significant differences between groups for quality of motivation ( $p = 0.242$ ,  $f = 1.428$ ,  $df = 2$ , Stable group,  $M = 10.720$ ,  $SD = 2.866$ , Midrange group,  $M = 10.037$ ,  $SD = 2.722$ , Neurotic group,  $M = 9.919$ ,  $SD = 3.030$ ).



**Figure 3.3.4** Differences between quality (all intrinsic motivation plus identified regulation, SMS subscales) and quantity (all intrinsic plus all extrinsic motivation, SMS subscales) of motivation for stable and neurotic athletes. \* $p < .01$

Using Eysenck's (1951) two dimensional framework, further analysis combining the extroversion-introversion and neurotic-stable continua were carried out (see table 3.3.1). There were significant differences between groups for EM identified regulation ( $F = 3.411$ ,  $p = 0.018$ ,  $df = 3$ ) and amotivation ( $F = 5.641$ ,  $p = 0.001$ ,  $df = 3$ ) subscales. *Post hoc* analysis found that stable-extrovert athletes had significantly greater levels of extrinsic motivation for identified-regulation than neurotic-introvert athletes ( $t = 2.497$ ,  $p = 0.014$ ,  $df = 99$ ) and neurotic-extrovert athletes ( $t = 2.390$ ,  $p = 0.018$ ,  $df = 210$ ). *Post hoc* analysis revealed that stable-extrovert athletes had significantly lower levels of amotivation than neurotic-introvert athletes ( $t = -2.445$ ,  $p = 0.016$ ,  $df = 99$ ) and neurotic-extrovert athletes ( $t = -3.976$ ,  $p = 0.000$ ,  $df = 210$ ). Significant differences were also found for quantity of motivation ( $F = 3.406$ ,  $p = 0.018$ ,  $df = 3$ ) and further *post hoc* analysis showed that stable extroverts had significantly higher quantities of motivation than both stable introverts ( $t = -2.134$ ,  $p = 0.035$ ,  $df = 98$ ) and unstable introverts ( $t = 2.748$ ,  $p = 0.007$ ,  $df = 99$ ).



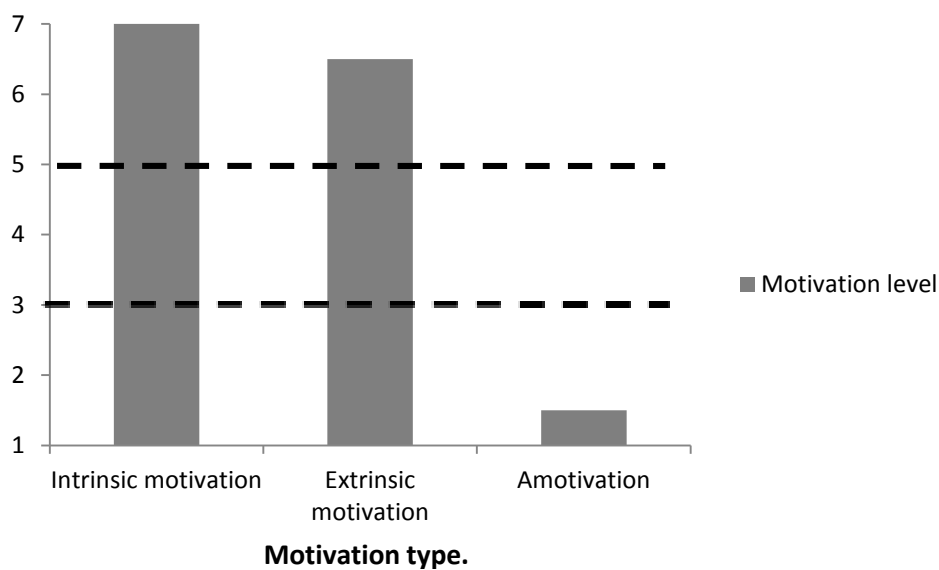
**Table 3.3.1** Differences in athlete motivation between personality groups.

	Intrinsic motivation			Extrinsic motivation			Quality	Quantity	
	To Know	To Accomplish	To experience stimulation	Introjected regulation	Identified regulation	Extrinsic regulation			
						Amotivation			
Stable-introvert	4.654	4.731	4.577	3.365	4.000	3.673	1.885	9.654	*25.000 <sup>e</sup>
(SD)	(0.971)	(1.502)	(1.573)	(1.364)	(1.544)	(1.188)	(0.801)	(4.033)	(5.868)
Stable-extrovert	4.750	5.092	5.239	4.000	*4.707 <sup>a,b</sup>	4.098	*1.546 <sup>e,d</sup>	10.276	*27.885 <sup>e, f</sup>
(SD)	(0.836)	(0.939)	(1.727)	(1.109)	(0.929)	(0.890)	(0.705)	(2.661)	(4.330)
Neurotic-introvert	4.071	4.589	4.696	3.571	*4.036 <sup>b</sup>	3.482	*2.054 <sup>d</sup>	9.411	*24.446 <sup>f</sup>
(SD)	(0.912)	(1.063)	(1.363)	(1.416)	(0.960)	(0.948)	(0.821)	(2.688)	(4.453)
Neurotic-extrovert	4.508	4.934	5.080	3.994	*4.356 <sup>a</sup>	3.886	*2.032 <sup>c</sup>	10.274	26.758
(SD)	(1.065)	(1.087)	(0.994)	(1.241)	(1.128)	(0.951)	(0.977)	(2.780)	(4.689)

a, b, d, e Means sharing the same superscript are significantly different  $p < .05$ .

c, f Means sharing the same superscript are significantly different  $p < .01$

Motivational profiles, in table 3.3.1, also show that stable-extroverted athletes had the highest overall motivation across all subscales and the lowest levels of amotivation than all other groups. As a result of the literature findings and conclusions from study 1, an ideal motivation profile for self-determined motivation has been extrapolated that would consist of high levels of intrinsic motivation, slightly lower levels of extrinsic motivation and low levels of amotivation (see figure 3.6.1). A high score equates to 5-7 reported on a 1-7 likert scale, a medium score equates to 3-5 and low score equates to 1-3 on a 1-7 likert scale. These levels equating to low, medium and high scores have been classified through the SMS measurement scale where the subscales can be collapsed into intrinsic, extrinsic and amotivation factors (Hart et al. 2007).



**Figure 3.6.1** Justifying an Ideal Motivational Profile.

It was expected that extrinsic motivation for an ideal profile would consist of medium levels of extrinsic motivation, whereas figure 3.6.1 shows a high score. Literature indicates that increased extrinsic motivation has negative effects on intrinsic motivational reliance. However, an explanation for the scores shown in the ideal motivation profile suggests that, in real life situations there are very few instances where individuals may be fully intrinsically or extrinsically motivated and those who show more overall motivation have been shown to use a combination of intrinsic and extrinsic motives (Maltby and Day 2001; Weiss and Ferrer-Caja 2002; Vansteenkiste et al. 2006; Deci and Ryan 2008; Ullrich-French and Cox 2009). Thus the extrinsic motivation level should still remain in the high category but should be lower than the intrinsic motivation. This can help the individual retain a higher quality of motivation whilst maintaining the quantity of motivation which has been shown to enhance performance and persistence (Mata et al. 2009; Ullrich-French and Cox 2009; Vansteenkiste et al. 2009).

### **3.4 Discussion**

Intrinsic motivation was significantly lower for introverted compared to extroverted athletes. Introverts have been found to be more introspective in nature than extroverts often misinterpreted as a withdrawal from society, however Jung (cited in Hinckle 1925) suggests it is a more reflective approach whereby the introvert analyses situations and stimuli before reacting as opposed to the extrovert. Physical findings have also supported this difference between introvert and extrovert. Forsman et al. (2012) found that areas in the brain well known for introspection (e.g. right prefrontal cortex and the cortex around the right temporoparietal junction), are larger in the introvert compared to the extrovert. Thus the introspective nature of introverted athletes suggested that their levels of intrinsic motivation would be far higher than extroverted athletes, with their outward focus (Faye and Sharpe 2008). The introverted athletes' may have generally been seeking to control their higher levels of non-specific arousal and this could reduce their desire to stand out in stimulating sport situations thus reducing their overall levels of motivation (Olson and Weber 2004). Research shows strong links between satisfaction and intrinsic motivation (Lewis and Sutton 2011; Martín-Albo et al. 2012) yet this does not explain why introverted athletes in this study reported significantly less intrinsic motivation than extroverted athletes. Elliot and Thrash (2002) suggest that introverted athletes may just be more satisfied with their performances and thus, have no further desire to seek out new challenges resulting in lower reported motivation.

It was expected that extroverted athletes would report higher levels of extrinsic motivation than introverted athletes, as was the case for this study, mainly because the desire for extroverts to

seek out and thrive in social situations and situations where their impulsive nature can excel, is well documented (e.g. Freyd 1924; Geen 1984; Offir et al. 2007). Also as expected, extroverted athletes reported highest overall levels of motivation both for quality and quantity of motivation. This suggests that extroverts are effectively utilising both intrinsic and extrinsic motivation and could also be linked to their tendency to select appropriate coping strategies (Tamir 2005; Luhmann and Eid 2009). Effective coping then results in a more positive approach towards goal achievement strongly enhances perceived competence (Judge and Ilies 2002) directing the individual's focus towards the process of longer term goal achievement (Roberts et al. 2004; Barnett 2006). The stable-extrovert group also reported the highest levels of intrinsic and extrinsic motivation and the lowest levels of amotivation than the other groups. The significantly higher identified-regulation for extroverted athletes in this study, suggests that these extroverts want to be seen as part of their sports group actively seeking out and adhering to the values of a group (Martens and Webber 2002; Deci and Ryan 2008; Lavigne et al. 2009).

Although amotivation was the lowest rated motivation score for all personality groups, the neurotic athletes showed significantly higher levels of amotivation than their stable counterparts. This was largely expected as individuals high in neuroticism are more likely to experience increased self-doubt which is likely to cause a confusion towards the activity leading to amotivation (David 2010). Amotivation can be high for individuals who accept that they could fail in an activity (Covington and Mueller 2001); due to short term sacrifice for longer term gain (Pushkar et al. 2002; Tamir 2005); or a tendency to set unrealistically high goals. This in turn influences the individual's emotional demeanour resulting in increased negative affect which has also been linked to high levels of neuroticism (Gomez et al. 2002; Tamir 2005). Furthermore, emotional effects could be exacerbated for the neurotic athlete through their tendency to select maladaptive coping strategies (Robinson and Tamir 2005; Furnham and Christoforou 2007). Amotivation has been linked to situations where there are high levels of external control and extrinsic expectation, leaving little room for choice or autonomous decision making (Deci and Ryan 2008). Therefore, in a situation where the individual is not achieving their outcome-focused goals, amotivation may be more sensitive to failure, further exacerbated by intense responses to negative conditions (Robinson et al. 2007).

Participants in this study were recruited from a homogenous sample; they all participated in sport and exercise at least three times per week. The consistency of the motivation scores and conformity of the motivation profiles demonstrate this. For example, intrinsic motivations were higher than extrinsic motivations with amotivation representing the lowest scores for each

group. This may not have been the case for a non-sporting population sample. However, participants in this study also demonstrated heterogeneous tendencies as they participated in different sports, were recruited from different sports courses and may have perceived motivation in different ways. This is reflected in the significant differences reported between personality groups. The majority of participants were classified as extrovert both stable and neurotic-extroverts, as expected for a sports population. This bias towards an extroversion profile was expected from a sporting population as the risk-taking and social acceptability found in many sporting contexts fits well with identified characteristics within extroverted tendencies (Freyd 1924; Geen 1984; Offir et al. 2007). Nevertheless there were representations for both stable and neurotic-introverts within a sports person sample.

### **3.4.1 Limitations**

This study used a cross sectional survey design which collected data at only one point in time, therefore, any change in relationship between neuroticism and amotivation can only be surmised. It is hard to infer causality from a survey design and it is uncertain how long general feelings of pressure and stress take to transfer to the more generic personality characteristics resulting in higher levels of reported neuroticism (Judge and Ilies 2002). However, over time the individual's innate characteristics may still influence the response to conform to more usual processes (Hong and O'Neil 2001). Additionally, the use of a sports person population sample resulted in uneven groups skewing the results towards the extroversion end of the introversion-extroversion continua (extrovert,  $n = 212$ , introvert,  $n = 27$ ). Furthermore, when an ambivert category was included in the analysis, again there was a majority result for ambivert and extrovert (extrovert,  $n = 135$ , ambivert,  $n = 88$ , introvert,  $n = 16$ ). This result in itself supports accepted findings that sports participants exhibit many extroverted characteristics (Eagleton et al. 2007) and the results for introverts in this study should not be generalised across other situations. Finally, although some of the participants in this study were classified as mature students, this related to a very small minority and therefore, the mean age of  $20.34 \pm 5.52$  years could also be the factor for the number of participants reporting extroverted characteristics. Vigil-Colet et al. (2013) found that extraversion decreased with age and this reflected earlier research in this area.

### **3.5 Conclusions**

In conclusion sports participants in general demonstrate a motivational profile which is characterized by medium-high intrinsic motivation, medium levels of extrinsic motivation and

low amotivation. Furthermore, this profile was demonstrated more markedly by the stable-extrovert group through the combination of the extrovert tendency to seek out stimulating situations and an adaptive coping strategy. This manifests in a highly motivated individual who effectively utilises information from both intrinsic and extrinsic sources.

Finally, the effects of introverted and neurotic tendencies show a reduction in general motivation levels with a corresponding increase in amotivation. It may be that goals, achievement strategies and success or failure situations for introverts and neurotic athletes can be managed more effectively to further enhance overall motivation for sport.

### **3.6 General discussion**

An overview of the results from study 1 showed that two SMS motivational subscales were not found to be significantly different between any personality profile groups. These were intrinsic motivation to accomplish and extrinsic motivation for introjected regulation. Intrinsic motivation to accomplish suggests that individuals participate in order to challenge themselves (Gillet et al. 2009), however, the focus is on the process of that accomplishment rather than the outcome (Barkoukis et al. 2008). Introjection relates to a suboptimal internalisation of previously external motives which manifest through a perceived pressure to avoid feelings of guilt and shame (Vallerand and Bissonnette 1992; Koestner et al. 1996; Markland and Tobin 2004; Barkoukis et al. 2008; Levesque et al. 2008; Gillet et al. 2009) or to enhance feelings of self-worth (Niemic et al. 2008; Assor et al. 2009; Lonsdale et al. 2009). Suboptimal internalisation suggests that this process has not been completed within a self-determined or supportive environment (Maltby and Day 2001; Deci and Ryan 2008). A survey design cannot confirm that this is the case and further study in this area would be needed to confirm the assumption for this study.

Introjection is a strong motivator which does not rely fully on external factors, however it is still classified as a type of extrinsic motivation (Deci et al. 1994). Koestner et al. (1996) suggest that there may be distinctive cognitive, behavioural and emotional patterns from those scoring highly for this factor. I postulated that these patterns were demonstrated more clearly at the situational level of motivation as they are directly related to the situation encountered. Emotion is a relatively short-term construct and could have been diluted by the time it was measured away from the activity which triggered it and study 1 was focusing on the global and contextual elements of motivation with personality. In addition, data for study 1 was collected at a time point removed from actual participation, thus these feelings of guilt and shame, or pride and joy, along with accomplishment have been shown to occur more strongly immediately prior to or after an activity has taken place (Turnbull and Wolfson 2002; Biddle et al. 2003; Sirois 2004; Otani et al. 2007). Therefore, study 2 will investigate motivation pre- and post- activity for a longer period of time in order to assess changes and fluctuations in the type and amount of situational motivation. Furthermore, as a result of the findings from study 1 concerning the lack of accomplishment (goal related) and introjection (feeling related) differences, these two constructs were measured specifically along with motivation in subsequent studies. In addition to measuring situational motivation using the SIMS, participants in study 2 were asked to complete information about their goals and what they hope to achieve from their sessions then completed a psychometric measure about how they felt prior to the activity. Participants in

study 2 completed information about whether they achieved their goals and repeated the psychometric measure about how they felt once the activity was finished.

## **4.0 Study 2 Temporal short-term situational change in motivation for experienced and less experienced Pilates participants**

### **4.1 Introduction**

The focus of motivational research in sport and exercise has generally been concerned with motivational traits rather than states. Gillet et al. (2013: p 1201) states that, “Numerous studies have been conducted at the contextual level, but little research has examined the motivation-performance link at the situational level.” Whilst global and contextual motivation may help to predict future orientation and action, it does not aid the understanding of why individuals try hard in one task and not another, or how to stimulate an optimal motivational state (Hannula 2006). The concept of situational motivation relates to a here-and-now interpretation of drive for an activity (Guay et al. 2000). Depending on the situation, fluctuations between intrinsic and extrinsic motivation will occur where situational demands support one type of motivation over another in order to enhance overall motivation (Sansone et al. 1992; Pierro et al. 2006; Sit and Lindner 2006). Furthermore, as effective performance utilises both intrinsic and extrinsic strategies (Bailis et al. 2005; Hollombeck and Amorose 2005; Vansteenkiste et al. 2006), at the situational level the individual needs an ability to effectively alternate between these orientations thus maintaining optimal motivation for a task.

Measuring the concept of situational motivation within an exercise setting, such as Pilates, may provide an accurate measure of motivational change without the distraction of competitive success and failure conditions (Steinberg et al. 2001; Cury et al. 2003; Kilpatrick et al. 2003). As Pilates is a non-competitive activity, there is little expectation that goals and goal progress will be judged by fellow participants in a public manner. Pilates has been linked with enhancing an individual’s body awareness and proprioception through different complexities of relatively static functional movement (Owsley 2005; Gladwell et al. 2006; Merrithew 2009). In Pilates sessions, the main focus is on quality of movement in terms of control and balance (Gladwell et al. 2006; Merrithew 2009). The participant works individually in a self-paced and non-competitive environment (Owsley 2005) thus motivation should be highly intrinsic. However, progress within the skill still needs to be monitored via goals, to identify where to direct the effort (Gernigon et al. 2004; Pierro et al. 2006). Paradoxically, the very process of goal monitoring could change the individual’s focus from intrinsic towards an extrinsic perspective (Ogden and Whyman 1996). Whilst the reliance on both extrinsic and intrinsic motivational factors has been well documented, the temporal process through which these changes occur has



received less attention through the literature and little is known about the week to week changes in motivational orientation for an activity.

According to self-determination theory, regulation of both intrinsic and extrinsic motivation is thought to be controlled through a process of internalisation, where individuals accept the values of the activity as their own (Baumann and Kuhl 2005; Vansteenkiste et al. 2006; Standage et al. 2008). When first starting an activity, individuals may initially rely on more extrinsic motives (Sansone et al. 1992; Covington and Mueller 2001), such as achieving specific goals to enhance performance (Bye et al. 2007), or peer involvement (Prusak et al. 2004; Li et al. 2005; Sabiston et al. 2005). However, over time individuals are thought to develop an intrinsic interest in their chosen activity which may relate to increased confidence in their performance at the task, thus leading towards enhanced enjoyment (Sarrazin et al. 2002; Bye et al. 2007) and reported as intrinsic motivation (Hein and Hagger 2007; Deci and Ryan 2008; Standage et al. 2008). Where an individual's perception is that they lack competence this may affect adherence and interest in the task (Merkle et al. 2002; Gavin 2004; Chen and Hancock 2006). Thus less experienced individuals may show less intrinsic motivation than those with more experience in an activity.

Merrithew (2009) and Wilson (2008) found that individuals participating in Pilates generally start for reasons of necessity such as rehabilitation from injury or to enhance other functional movements which can be classified as extrinsic reasons. Although over time the individual may develop intrinsic reasons for performing Pilates exercises and come to appreciate the activity more, thereby helping to maintain task interest and subsequently, effort (Fries and Dietz 2007; Smith et al. 2007). However, this appreciation of the benefits of Pilates would be due to fulfilment of the individual's needs which will increase their sense of enjoyment and influence intrinsic motivation for future performance in this activity (Vallerand et al. 1986; Hollombeck and Amorose 2005). Continued and sustained participation in a physical activity is largely influenced by the value individuals place on the activity and how this develops across time through the internalisation process (Carver and Baird 1998; Recours et al. 2004; Lucidi et al. 2006).

Optimal internalisation leads towards more self-determined forms of externally integrated motivation where the individual internalises and accepts the value and benefits of the activity leading to behavioural effectiveness, persistence and enhanced perceptions of well-being (Ryan and Deci 2000). However, partial or suboptimal internalisation results in less self-determined

external introjection where the external motive has been accepted but is not in harmony with self-beliefs and concepts (Deci et al. 1994). In the case of suboptimal internalisation, the individual shows required behaviour because they have to and not because they want to which can cause feelings of pressure, tension and anxiety (Deci et al. 1994). In order to help promote internalisation, the individual needs to fully appreciate the values and benefits of an activity whilst promoting a perception of autonomy (Ryan and Deci 2000).

This study aims to investigate changes in situational motivation in experienced and less experienced Pilates participants. Therefore, from analysis of the literature, this study hypothesises that i) experienced Pilates participants will report consistently higher levels of intrinsic motivation than those less experienced; ii) intrinsic and more self-determined motivation will increase gradually for less experienced Pilates participants; iii) individuals with less experience of Pilates will report higher extrinsic motivation than more experienced participants, iv) extrinsic and less self-determined motivation will decrease over time for less experienced Pilates participants, v) affect will change pre- to post- Pilates sessions, vi) positive affect will be significantly higher for the experienced Pilates participants compared with the beginners vii) negative affect will be significantly lower for the experienced Pilates participants compared with the beginners and that affect will change over the 4-week block.

## **4.2 Method**

### **4.2.1 Design**

This study used a two way between-within subject design. Measures were repeated pre- and post- Pilates sessions across a 4 week block of Pilates and two groups of beginner and more experienced Pilates participants were identified to examine changes in situational motivation.

### **4.2.2 Participants**

Sixty-four male and female Pilates volunteers (Male  $n = 10$ , Female  $n = 54$ ; unreported  $n = 2$ ) from 5 regional Pilates classes took part in this study (ages ranged from 23-71 years).

Participants were categorised by level of Pilates experience, the criteria for which were determined by a consensus of regional Pilates instructors based on their expectations of task ability and core stability at the following time points. Beginners were identified as having up to 1 year of Pilates experience ( $n = 31$ , mean age  $44.48 \pm 11.02$  years); and the experienced group had more than 1 year of Pilates experience ( $n = 33$ , mean age  $46.90 \pm 10.79$  years).

### 4.2.3 Procedure

After gaining university ethical approval, volunteers were sought from five regional Pilates sessions. These sessions are typically completed in blocks of between 4-8 weeks and individuals participate at least once per week. Participants in this study attended a 4-week block and sessions were 1 hour duration. The weekly Pilates programme consisted of similar exercises for all participants. However, difficulty levels were manipulated by the instructor to suit beginners and challenge the more experienced individuals within each class. All sessions were delivered by the same qualified Pilates instructor. Over the course of a 4-week block, participants were asked to complete the SIMS (Guay et al. 2000) and the WAS (Rhoden and West 2010) immediately before and after each session they attended. Participants were also asked to complete a short open-ended question about what they '*would like to achieve during this session*' (see appendix 3, pp208-211). After each session participants were asked to report whether they had achieved their objective and their reasons for this achievement or non-achievement through a qualitative open-ended questionnaire. In an attempt to control any self-report bias, specific instructions were given at the beginning of each session suggesting, '*There is no right answer and you should not spend too much time analysing your response*'. Participants were encouraged to give as honest and instinctual an answer as possible.

### 4.2.4 Instrumentation

#### **Situational Motivation Scale (SIMS; Guay et al. 2000)**

The 16-item Situational Motivation Scale (Guay et al. 2000) is a measure of situational (or state) motivation toward a chosen activity. This self-report inventory contains four items per subscale and is designed to measure intrinsic motivation, identified regulation, external regulation, and amotivation. Participants are asked to respond to the stem, "*Why are you currently engaged in this activity?*" Each item is rated on a 7-point Likert scale ranging from 1 "*corresponds not at all*" to 7 "*corresponds exactly*". Cronbach alpha coefficients range from .70 to .90 across diverse sample populations demonstrating reliability and validity (Standage et al. 2003a; Ward et al. 2008). Cronbach alpha coefficients for this study ranged from .910 to .81 for the beginner group and .93 to .69 for the experienced group. The score for the experienced group of .69 was for the identified regulation subscale and this could be related to the different levels of experience from 1-6 years of Pilates experience.

#### **Worcester Affect Scale (WAS; Rhoden and West, 2010).**

The WAS was developed within the hierarchical framework suggested by Watson & Clark (1997) to measure the non-specific higher order level of PA and NA rather than the specific lower level affect descriptors, e.g. sad, joy. Two single item scales were devised, a positive

affect scale required participants to rate how positive they felt “right now” on a 10-point likert scale ( $1 = \text{not at all positive}; 10 = \text{extremely positive}$ ). The negative affect scale required participants to rate how negative they felt right now on a 10-point likert scale ( $1 = \text{not at all negative}; 10 = \text{extremely negative}$ ). The WAS takes between 5-10 seconds to complete thus enabling measurement of affect at a high frequency sampling during activity. Initially only the WAS would be used for this study, however, the WAS is a new measure and reliability of results using this measure have not been fully validated (Rhoden and West 2010). Therefore, this study also used the Positive and negative affect scale (PANAS; Watson et al. 1988) to enhance the reliability of affective response.

#### **Open-ended questionnaire.**

Immediately prior to participating in Pilates sessions, participants were asked to write their response to ‘*What would you like to achieve in this session?*’ After the Pilates session was completed, participants were asked whether they had ‘*achieved the objectives you set at the beginning during this session?*’ additionally they were asked to explain ‘*Why or why not?*’ in terms of whether they had achieved their goals.

### **4.2.5 Data analysis**

A mixed between-within subjects analysis of variance was conducted to assess changes in time and differences between experienced and beginner Pilates participants for intrinsic motivation, extrinsic motivation and affect. Multivariate analysis for this study would help to ensure credible and reliable data analysis, however, the final population numbers for examining data over the 4-week block of sessions meant that the population sample would be too small for this type of analysis (Thomas et al. 1999). Effect sizes are reported here using partial eta squared statistic whereby .01=small effect; .06=moderate effect; and .14=large effect (Pallant 2007). A paired samples t-test was used to assess differences in affect for beginners and experienced Pilates participants pre- to post-session for each week.

### **4.3 Results**

A mixed between-within subjects ANOVA was conducted to assess changes over time and differences between a beginner and more experienced groups’ motivation in Pilates over a 4-week block of sessions. There were no significant interaction effects between the groups and time (Wilks Lambda=.384,  $F=[7, 12] 2.752, p=.059$ , partial eta squared = .616) for intrinsic motivation (see table 4.3.1). Main effects for time were significantly different (Wilks Lambda=.268,  $F=[7, 12] 4.685, p=.010$ , partial eta squared=.732) with both groups similarly showing increases in intrinsic motivation over the 4-week block. There were no significant

differences between groups for intrinsic motivation ( $F=1.869$ ,  $df=1$ ,  $p=.188$ , partial eta squared=.094).

**Table 4.3.1** Mean, standard deviation and sample size data for motivational orientations pre- and post- Pilates sessions. \* $p < .05$

Motivational orientation	Group		Week 1		Week 2		Week 3		Week 4	
			Pre	Post	Pre	Post	Pre	Post	Pre	Post
			M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
	Beginner	N	22	23	23	21	19	19	20	20
	Experienced	N	25	23	29	26	25	23	26	26
Intrinsic motivation										
	Beginner		4.943 (1.305)	5.417 (1.290)	5.120 (1.087)	5.452 (1.045)	5.552 (1.141)	5.368 (1.757)	5.400 (1.406)	5.463 (1.554)
	Experienced		5.150 (1.548)	5.489 (1.512)	5.595 (1.324)	5.962 (1.168)	5.710 (1.300)	5.640 (1.962)	5.885 (1.227)	5.981 (1.204)
Identified Regulation										
	Beginner		6.341 (0.766)	6.202 (0.828)	6.022 (0.935)	6.120 (0.868)	6.250 (0.862)	6.053 (1.655)	6.238 (0.849)	6.238 (0.998)
	Experienced		6.220 (1.059)	6.380 (0.818)	6.440 (0.731)	6.375 (0.975)	6.450 (0.884)	6.200 (1.913)	6.615 (0.562)	6.712 (0.503)
External regulation										
	Beginner		1.489 (1.226)	1.274 (0.684)	1.511 (0.796)	1.702 (1.249)	1.316 (0.600)	1.184 (0.816)	1.350 (0.965)	1.488 (1.114)
	Experienced		1.890 (1.627)	1.685 (1.442)	1.595 (1.362)	1.644 (1.507)	1.580 (1.346)	1.370 (1.345)	1.673 (1.292)	1.625 (1.287)
Amotivation										
	Beginner		1.545 (1.071)	1.226 (0.467)	1.380 (0.643)	1.333 (0.830)	1.000 (0.000)	1.013 (0.377)	1.175 (0.539)	1.113 (0.401)
	Experienced		1.260 (0.671)	1.380 (0.815)	1.129 (0.338)	1.163 (0.612)	1.160 (0.438)	0.940 (0.300)	1.163 (0.406)	1.058 (0.248)

There were no significant interaction effects between the groups and time for external regulation (Wilks Lambda=.512,  $F=[7, 12] 1.635$ ,  $p=.217$ , partial eta squared=.488). Main effects over time (Wilks Lambda=.549,  $F=[7,12]1.411$ ,  $p=.286$ , partial eta squared=.451) and between groups ( $F=1.212$ ,  $df=1$ ,  $p=.286$ , partial eta squared=.063) were also not significantly different. There was also no significant interaction between groups and time for identified regulation (Wilks Lambda=.775,  $F=[7,12].499$ ,  $p=.818$ , partial eta squared=.225). Main effects for time (Wilks Lambda=.572,  $F=[7,12]1.281$ ,  $p=.337$ , partial eta squared=.428) and between groups ( $F=1.168$ ,  $df=1$ ,  $p=.294$ , partial eta squared=.061) showed no significant differences.

The final SIMS subscale for amotivation also showed no significant interaction between the groups and over time (Wilks Lambda=.667,  $F=[5,14]1.401$ ,  $p=.283$ , partial eta squared=.333). Main effects for amotivation over time (Wilks Lambda=.613,  $F=[5,14]1.770$ ,  $p=.184$ , partial eta squared=.387) and between groups ( $F=.280$ ,  $df=1$ ,  $p=.603$ , partial eta squared=.015) were non-significant.

Over weeks 1-3 there was an increase in the percentage of participants in both the experienced and beginner group who recorded session goals (see table 4.3.2). However, in week one 17 experienced participants reported no pre-session goals and yet 22 experienced participants reported positive goal achievement post-session. The beginner group results showed that 8 participants did not report pre-session goals but did report positive goal achievement post-session. Perceived goal achievement for both groups was higher than the number of participants who set pre-session goals.

**Table 4.3.2** Percentage of Pilates participants who reported goals pre-session and perceived overall goal achievement post-session for beginner and experienced groups.

	Week 1	Week 2	Week 3	Week 4
Percentage of each group				
who recorded session goals (%)				
Beginner (n)	39 (12)	55 (17)	58 (18)	55 (17)
Experienced (n)	52 (17)	90 (28)	73 (24)	79 (26)
Perceived goal achievement (%)				
Beginner (n)	65 (20)	65 (20)	68 (21)	65 (20)
Experienced (n)	71 (22)	94 (29)	76 (25)	82 (27)

Many participants set multiple goals and all goal content were related to combinations of relaxation, core training, release of stress, help with injury and pain, increasing flexibility and enhancing posture. Four beginners and 3 experienced participants reported goals and reported no post-session goal achievement. Reasons for this lack of goal achievement from the experienced group were more internally derived, for example, '*I needed more time before the feeling of energy kicks in*' '*mind on work*'. Whereas for the beginner group responses related to the session structure and content, for example, '*we didn't work on this*', '*[the transition was] too quick, I am still concentrating on coordination*'. Participants also provided reasons for them not setting a goal for the session and these included, '*we did not know what exercises would be*

*covered in that session...’ ‘we worked very hard but still felt as though I didn’t have full control so I didn’t achieve my goal...’.*

A paired-samples t-test was carried out to assess differences in affect pre- to post-session after each weeks Pilates session for the beginner and experienced group (see table 4.3.3). There were significant increases in positive affect pre-to post-session for the beginner group in week 1 (95% CI range from -2.384 to -.616), week 2 (95% CI range from -2.123 to -.877) and week 4 (95% CI range from -1.844 to -.471). There were significant decreases in negative affect pre- to post- session for the beginner group in week 1 (95% CI range from 1.276 to 2.724), week 2 (95% CI range from 1.101 to 2.233), week 3 (95% CI range from .644 to 2.578) and week 4 (95% CI range from .664 to 1.757). There were significant increases in positive affect for the experienced group in week 1 (95% CI range from -1.694 to -.397), week 2 (95% CI range from -1.257 to -.386), week 3 (95% CI range from -1.846 to -.954) and week 4 (95% CI range from -.827 to -.096). There were also significant decreases in negative affect for the experienced group in week 1 (95% CI range from .372 to 1.264), week 2 (95% CI range from .120 to 1.095) and week 3 (95% CI range from .797 to 2.083).

**Table 4.3.3** Pre- to post-session differences in positive and negative affect for the beginner and experienced group of Pilates participants.

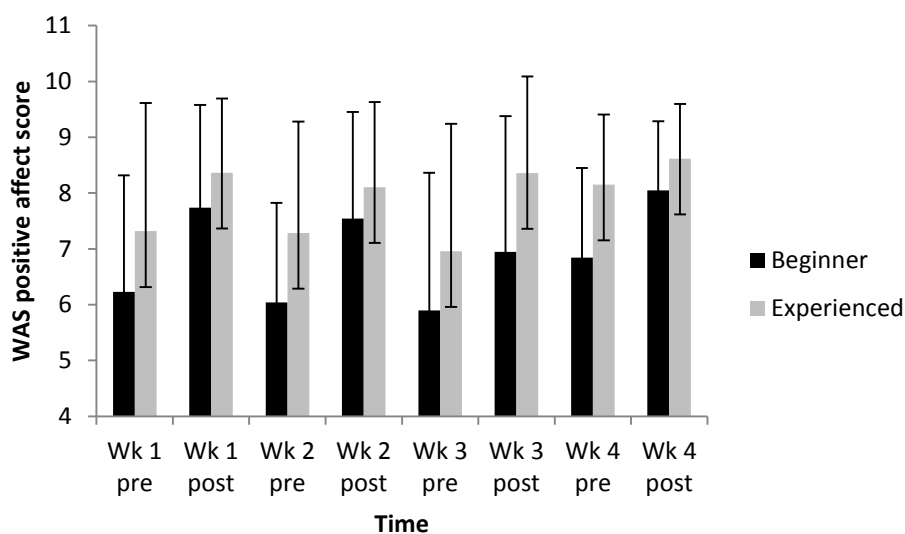
Group	Session	n	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	Partial eta squared
Beginner								
Positive affect	Wk1pre	22	6.227**	2.092				
	Wk1post		7.727**	1.881	-3.528	21	.002	-.506
	Wk2pre	24	6.042**	1.781	-4.984	23	.001	-.277
	Wk2post		7.542**	1.911				
	Wk3pre	18	5.889	2.541	-1.707	17	.106	-.251
	Wk3post		6.944	2.437				
	Wk4pre	19	6.842**	1.608	-3.543	18	.002	-.649
	Wk4post		8.000**	1.247				
Beginner								
Negative affect	Wk1pre	22	4.636**	2.536				
	Wk1post		2.636**	1.787	5.745	21	.001	.611
	Wk2pre	24	4.167**	1.949	6.091	23	.001	.209
	Wk2post		2.500**	1.414				
	Wk3pre	18	4.611**	2.704	3.515	17	.003	.421
	Wk3post		3.000**	1.940				
	Wk4pre	19	3.947**	2.094	4.652	18	.001	.546
	Wk4post		2.737**	1.408				
Experienced								
Positive affect	Wk1pre	22	7.318**	2.297				
	Wk1post		8.364**	1.329	-3.352	21	.003	-.469
	Wk2pre	28	7.286**	1.997	-3.867	27	.001	-.401
	Wk2post		8.107**	1.524				
	Wk3pre	25	8.960**	2.282	-6.481	24	.001	-1.174
	Wk3post		8.360**	1.729				
	Wk4pre	26	8.154*	1.255	-2.601	25	.015	-.263
	Wk4post		8.615*	0.983				
Experienced								
Negative affect	Wk1pre	22	3.182**	2.130				
	Wk1post		2.364**	1.590	3.813	21	.001	.409
	Wk2pre	28	3.214*	2.250	2.555	27	.017	.195
	Wk2post		2.607*	1.853				
	Wk3pre	25	4.000**	2.723	4.625	24	.001	.471
	Wk3post		2.560**	1.873				
	Wk4pre	26	2.385	1.267	1.886	25	.071	.125
	Wk4post		2.039	1.248				

\* $p < .05$

\*\* $p < .01$

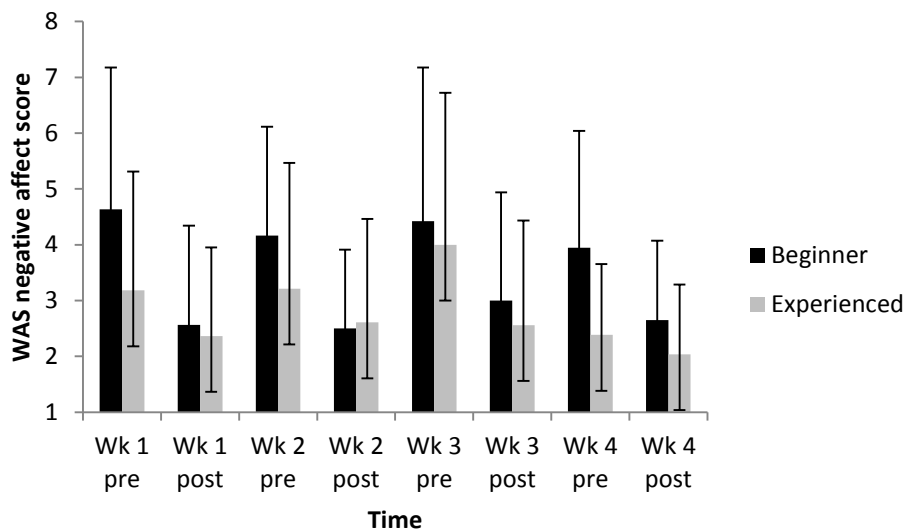


A mixed between-within subjects ANOVA was conducted to assess changes over time and differences between a beginner and more experienced groups' positive and negative affect in Pilates over a 4-week block of sessions. There were no significant interaction effects between the groups and time (Wilks Lambda = .566,  $F=[7,14]$  1.534,  $p=.234$ , partial eta squared =.434) for positive affect (figure 4.3.1). Main effects for time were significantly different (Wilks Lambda=.197,  $F=[7,14]$  8.147,  $p=.001$ , partial eta squared = .803) with both groups similarly showing increases in positive affect over the 4-week block. There were also significant differences between groups ( $F=13.694$ ,  $df=1$ ,  $p=.001$ , partial eta squared = .406) with the experienced group reporting significantly more positive affect both pre and post sessions across the 4-week block.



**Figure 4.3.1** Differences in WAS positive affect (PA) pre- and post- session between beginners and experienced participants. \* $p < .05$

There were no significant interaction effects between the groups and time for negative affect (Wilks Lambda = .477,  $F=[7,14]$  2.190,  $p=.100$ , partial eta squared = .523). Main effects for time were significantly different (Wilks Lambda = .241,  $F=[7,14]$  6.314,  $p=.002$ , partial eta squared = .759) with both groups similarly showing decreases in negative affect over the 4-week block. There were also significant differences between groups ( $F=10.554$ ,  $df=1$ ,  $p=.004$ , partial eta squared = .345) with the experienced group reporting significantly less negative affect both pre- and post-session across the 4-week block (figure 4.3.2).



**Figure 4.3.2** Differences in WAS negative affect (NA) pre- and post- session between beginners and experienced participants. \*  $p < .05$

#### 4.4 Discussion

In this study, it was hypothesised that experienced Pilates participants would report higher levels of intrinsic motivation than beginners in Pilates. Surprisingly, in contradiction to literature and expected results, the findings of this study show that there were no significant differences in intrinsic motivation between the beginner group and the experienced group. Intrinsic motivation alludes to undertaking a task or activity for its inherent interest and enjoyment (Vansteenkiste et al. 2006). It is possible that the more experienced group of participants perceived Pilates as less enjoyable, rather routine and more of a chore over time (Sansone et al. 1992; Smith et al. 2007) diminishing their intrinsic focus (Sansone et al. 1992; Reiss 2005; Fries and Dietz 2007). Additionally, the beginners group may have reported higher levels of intrinsic motivation than expected through experiencing immediate benefits from their participation. Starting a new activity can enhance feelings of satisfaction and enjoyment just through initial participation (Martin 2010). As the beginners group were in the early stages of their Pilates participation this could influence their perceived intrinsic motivation.

Less experienced Pilates participants were expected to report increasing levels of intrinsic motivation over time, whilst this was found to be the case, both the experienced Pilates participants and the beginners demonstrated significant increases in intrinsic motivation from week one to week four. Intrinsic motivation is considered to be important in maintaining long

term participation in an activity (Carver and Baird 1998; Lucidi et al. 2006) and has been found to enhance focus on short term goals which can eventually progress to longer term achievement (Thøgersen-Ntoumani and Ntoumanis 2006). The significant increase in intrinsic motivation over time, could be related to the participants being given back some control over their participation such that the instructor encouraged participants to select their own level of difficulty for each exercise. Increases in intrinsic motivation tend to enhance the individual's overall experience of the activity which leads to enhanced motivation in the future and is likely to foster positive affect for the activity (Lasane and Jones 1999; Prusak et al. 2004; Papaioannou et al. 2007). Additional reasons for the changes in intrinsic motivation both pre to post and across the four weeks could reflect the non-competitive nature of the Pilates activity chosen for this study (Frederick and Ryan 1993; LaChausse 2006). If the same procedure was carried out within a competitive sporting activity, changes in other motivational constructs could occur through meeting external aims and goals thus affecting factors on the extrinsic subscale (Martens and Webber 2002; Mallet 2005; Beaudoin 2006; Vansteenkiste et al. 2006).

There is a wealth of literature for motivation in sport and exercise, however, most of this focuses on contextual motivation where measurement has occurred at the contextual level and therefore, how motivation changes during the short term has not been thoroughly investigated (Janman 1987; Frederick and Ryan 1993; Maltby and Day 2001; LaChausse 2006). As discussed earlier, current literature suggests that, at the situational level of motivation, expected motivational change or fluctuation would occur mainly in the less self-determined extrinsic and amotivation categories due to the links between intrinsic motivation with long term aims and the internalisation process (Maltby and Day 2001; Prusak et al. 2004; Li et al. 2005; Sabiston et al. 2005; Vansteenkiste et al. 2006; Deci and Ryan 2008; Standage et al. 2008).

Through a process of internalisation, over time previously external motives become more valued and perceived as intrinsic motivation through a process of internalisation (Deci and Ryan 2008). However, there were no differences between beginners or more experienced Pilates participants for situational extrinsic motivation for external regulation or for identified regulation. In order for optimal internalisation to occur, this process requires an autonomous environment (Maltby and Day 2001; Standage et al. 2008). During the first Pilates session used for this study, the instructor was observed to control the type of activity throughout the session with no input from participants. The instructor also suggested target repetitions for each exercise thus providing a controlled environment which may preclude optimal internalisation for the experienced group. Research suggests that as individuals become more competent they

prefer increased autonomy during sessions (Coatsworth and Conroy 2009). Furthermore, whilst a controlling environment can influence a shift towards extrinsic motivation, it provided the beginner group with specific information about performing the unfamiliar Pilates movements thus serving to help alleviate uncertainty and worry (Chen and Hancock 2006). This guidance potentially enhanced perceived competence leading to increases in the internal values of the beginner group thus providing further explanation as to why the beginners group and the experienced group had similar levels of intrinsic motivation for this study. The experienced groups' goal focus also suggests they were relying on more self-determined motives relating to specific outcomes ('*increase flexibility*', '*increase core strength*'). It may be that the nature of performance within the Pilates environment, enabled participants to focus on more intrinsic goals and start to internalise their motives. Previous research suggests that situations of suboptimal internalisation can occur where individuals feel as though they have no autonomy during activity (Mallet 2005; Sabiston et al. 2005; Thøgersen-Ntoumani and Ntoumanis 2006).

As Pilates is a non-competitive exercise which focuses on completing a task rather than outcomes relating to specific goals or normative comparison, this study hypothesised that over time extrinsic motivation would decrease. The findings showed that this was not the case for either the beginners or the experienced groups with both groups maintaining a relatively stable level of extrinsic motivation across the 4-week block. Familiarity with the Pilates exercises may have resulted in the experienced group setting more challenging goals and this coupled with a necessity to monitor goal progression suggests the experienced group were focusing more on performance outcomes in order to determine where to put their effort in order to achieve their goals (Gernigon et al. 2004; Pierro et al. 2006). In this way, extrinsic motivation and rewards can create additional incentive and values for the task and in some cases provide competence information (Vallerand et al. 1986; Eisenberger et al. 1999; Vansteenkiste et al. 2006). Extrinsic goals are recognised as being powerful motivators, however, they may not sustain performance intensity in the long term, leading to poor quality persistence for the task (Vansteenkiste et al. 2006). In order for individuals to be effective in a Pilates situation, their motivational strategy would need to include both intrinsic and extrinsic factors as it may be limiting to base motivation on only one source (Steinberg et al. 2001; Bailis et al. 2005; Hollebeak and Amorose 2005).

Although Pilates is a largely self-paced activity, all participants across both groups reported medium levels of extrinsic motivation (3-4 out of 7) for this study. The benefits from participating in Pilates could be classed as extrinsic, for example, an increase in flexibility and

core strength and an improvement in posture particularly if the individual was undertaking Pilates alongside and as part of physiotherapy treatment. Additionally, the process of working towards these outcomes may not be seen as pleasant and thus reported as an extrinsic motive (Lasane and Jones 1999; Reiss 2005; Smith et al. 2007). However, the similarity of extrinsic motivation between the groups may have been further influenced through asking all participants to specify their goals and report subsequent achievement weekly. The process of monitoring goal progression can predispose individuals towards interpreting an extrinsic orientation (Ogden and Whyman 1996; Murphy and Roopchand 2003). Furthermore, whilst Pilates is considered to be largely non-competitive, there were opportunities within sessions for participants to discreetly monitor others' performance and this could foster a more extrinsic and competitive focus for one or more individuals within Pilates sessions. This could be accentuated where participants have been attending for similar periods of time and feel as though they should be performing at similar levels.

A few of the qualitative comments provided in the open-ended questionnaires, suggested that setting goals for each session was difficult as participants did not know what exercises they would be doing in that session and this may further explain the significantly higher amotivation for the experienced group. However, participants also reported goal achievement for their more specific goals. Goal achievement engenders feelings of satisfaction which in turn enhances intrinsic motivation (Lavigne et al. 2009). Whilst extrinsic motivation may be less desirable than intrinsic motivation, overall a mixture of both intrinsic and extrinsic motives may be more effective (Steinberg et al. 2001; Bailis et al. 2005; Hollombeak and Amorose 2005) for Pilates participation.

High levels of amotivation would usually be linked with high levels of negative affect (Gendolla and Krüsken 2002; Sarrazin et al. 2002). However, the significantly higher positive affect for the experienced group and the significantly lower negative affect for this group compared with the beginners does not support this. The experienced group were reporting high levels of goal achievement and it is suggested that the type of goals, the perceived goal achievement and the increasing level of autonomy during sessions, were being favourably perceived by the experienced group.

Additionally in support of the assumption that affect is closely linked to situational motivation, this study found a number of significant changes in positive and negative affect prior to Pilates sessions. The differences were smaller between the experienced and beginner participants for

affect post-Pilates sessions. Thus it could be assumed that affect is involved with motivational response prior to activity and not just as a consequence of motivated behaviour. An informal and non-competitive setting, such as Pilates, may show affect and motivational relationships which are less likely to be influenced by a perceived ego orientated climate or immediate success and failure outcomes (Recours et al. 2004).

Two of the main overarching aims for this thesis, are to identify factors which relate to situational motivation and to examine the processes of situational motivation. As data from study 1 suggested that intrinsic motivation to accomplish and extrinsic motivation for introjected regulation were not linked to a global level of generality from the HMIEM, it was considered that goal related data and emotional or affective data were more closely linked to situational motivation processes. Thus this thesis now seeks further evidence for a relationship between affect and situational motivation prior to activity. Currently the SDT theory and literature acknowledge that affect occurs as a result of activity (Ntoumanis 2001; Faye and Sharpe 2008; Gillet et al. 2009). However, there are some findings in the literature and from this study, which do not necessarily fit this model and further discussions have suggested that affect may influence future behaviour and motivation for an activity (Linnenbrink and Pintrich 2002; Turnbull and Wolfson 2002; Locke and Latham 2004; Hardy and Gustavo 2005; Barnett 2006).

#### **4.4.1 Limitations**

The criteria for distinguishing between the beginner and experienced groups were devised by time rather than ability. However, some individuals may have attained higher levels of competence more quickly than others in their group leading to heterogeneous groups. Indeed it is possible for some individuals in the beginners group who had participated for just under 1 year to be as good as those in the experienced group who had attended for just over a year. It is recommended for future studies that an assessment of ability and familiarity to determine groups is used.

Participants in this study were provided with a subject information sheet asking that they record goals prior to the session and goal achievement afterwards. However, it is possible that participants unfamiliar with this terminology would not have realised the implications for this. Once participants came to fill in the post-session data sheet they would have realised the necessity for reporting goals on the pre-session data sheet. In week one, 8 of the beginner group and 5 of the experienced group reported goal achievement but did not record pre-session goals.

There were still a small percentage of participants who reported goal achievement and yet did not record goals for the remaining 3 weeks of data collection, suggesting a learning effect for some participants. Additional reasons for the lack of written goal pre-session could include a perceived time pressure for thinking about and then writing goals on the data sheet pre-session or recalling this information post-session. Furthermore, participants can have difficulty to expressing goals, particularly if the goals are intrinsic or individuals are unaware of their motivational orientation. The very process of asking for goal data can influence some individuals to become consciously aware of and record goals. This suggests a Hawthorne effect within this study, however, recent literature suggests the Hawthorne effect is expected in real world data collection and a focus on this could hide other factors impacting on this study (Chiesa and Hobbs 2008).

The SIMS measure used in this study differentiates between intrinsic motivation, extrinsic motivation and amotivation. However, SDT suggests very subtle differences between intrinsic motivation and the most self-determined forms of extrinsic motivation which could easily become misinterpreted. Shaw et al. (2005) utilised the SIMS for a population of masters athletes who were long term participants in their sport. Some amotivation items loaded onto the intrinsic motivation subscale and this may have been due to goals not being achieved instantly or continued participation in the activity was being questioned by the individual (Shaw et al. 2005). This could help explain why the experienced group in this study reported similar levels of intrinsic motivation as the beginner group in week one. Further assessment of validity and reliability of the SIMS is warranted.

There was a large non-completion and drop-out rate of participants for this study which affected analysis of data across the 4-week block of Pilates sessions resulting in small samples for both the experienced group ( $n = 23-29$ ) and the beginner group ( $n = 19-23$ ). Attendance at sessions averaged 40 participants each week, however, some participants completed a pre- or post-session data sheet only and others missed between 1 and 3 sessions across the 4-week block therefore this data could not be included for the repeated measure analysis.

## **4.5 Conclusions**

Although there were no significant differences between intrinsic or extrinsic motivations for an experienced group compared to a beginners group of Pilates participants, both sgroup were shown as having significant increases in levels of intrinsic motivation as the weeks progressed.

Individuals need to set and achieve goals or objectives associated with the task (Wentzel 1999) and these may be intrinsic or extrinsically focused. Many activities stress the importance of enjoyment to enhance intrinsic motivation (Barnett 2006; Beaudoin 2006; Vansteenkiste et al. 2006) but there is also a need for challenge to enhance overall levels of motivation for an activity.

Within a non-competitive and relatively self-paced activity such as Pilates, there were still opportunities for individuals to rely on extrinsic motivational factors as opposed to solely intrinsic factors. However, it should not be assumed that all new beginners to this type of activity rely on extrinsic motives initially as the goals for the beginners group were related to general processes. Through providing and encouraging some level of choice within an activity, the instructor is enabling participants to develop a range of motivational orientations for Pilates which also enhances optimal performance through utilisation of multiple motivation strategies and feedback (Tauer and Harackiewicz 2004; Deci and Ryan 2008; Vansteenkiste et al. 2009).

This study found significant changes in situational motivation for Pilates over a 4-week block of Pilates sessions. There were also changes in goal achievements across the 4-weeks of sessions, with increasing numbers of participants reporting they achieved their pre-session goals.



## **4.6 General discussion**

An overview of the results from study 1 and study 2 suggest that extrinsic motivation may be more readily observable and reportable at the contextual and more global levels of motivation (study 1), but at a more situational level of investigation, results show that intrinsic motivation changes from situation to situation (study 2). This could be related to an initial interest in the activity coupled with an immediate initial increase in competence (LaGuardia 2009), or because of the nature of the activity used in study 2. This activity, Pilates, is a non-competitive and largely self-directed activity which was used in study 2 to control the influences of success or failure outcomes commonly seen in sporting activities (Steinberg et al. 2001; Kilpatrick et al. 2003; Recours et al. 2004; Smith et al. 2006a).

The hierarchical model of motivation (see figure 2.2.6: p.19) shows that the basic psychological needs of autonomy, competence and relatedness are antecedents for the global, contextual and situational levels of motivation (Vallerand, 2001; 2008). If it is accepted that intrinsic motivation to accomplish aligns with goal setting, goal progress and goal achievement and extrinsic motivation for introjected regulation aligns with affect, then the results from study 1 and study 2 suggest that intrinsic motivation to accomplish and extrinsic motivation for introjection may be more prone to change at the situational level. It is possible that this could be further extrapolated such that, goal striving and affect may be better and more important antecedents for situationally motivated behaviour. Motivation to accomplish has been defined as the process of goal achievement rather than the actual outcome (Barkoukis et al. 2008; Gillet et al. 2009) and this could be related to accomplishment of the basic psychological needs. The literature suggests that these basic psychological needs are the most important drives and goals for all motivated behaviours (Heckert et al. 2000; Baumann and Kuhl 2005; Deci and Ryan 2000; 2008). Therefore, if autonomy, competence and relatedness are interpreted as goal striving, then the HMIEM would need to include affect as an antecedent as well as a consequence of motivated behaviour at the situational level.

Affect could be considered to influence the situational representation of an individual's trait characteristics, manipulating individual's opinions and judgements consistent with how they feel, thus affecting interpretation, decision making and ultimately effort and performance (Haddock et al. 1994; Gendolla and Krusken 2002; Hareli and Weiner 2002; Linnenbrink and Pintrich 2002; Chatzisarantis et al. 2005; Rhodes et al. 2006; Smith 2006). Individuals who have reported high levels of neuroticism have also been found to report consistently high levels of

negative affect. Literature suggests that traits control individual's responses to situations (Steyer et al. 1999) unless the situation exerts an extremely strong influence on the individual to override this (Ewen 2010). However, even where the situation manipulates the individual's behaviour directly, the trait characteristics may still provide controlling parameters within which these behaviours occur (Hong and O'Neil 2001). Nevertheless, the resultant behaviours may operate at the extremes of the underlying representative traits which may not be instantly recognisable as the usual trait behaviour. Thus affect may influence the individual's perception of the situation, which could be the most important aspect of this process (Rose et al. 2001) and this may occur prior to the onset of that particular situation. For example, the literature suggests that those high in positive affect tend to demonstrate less stress and higher levels of consistent performance than those experiencing negative affect (Gendolla and Krüsken 2002; Turnbull and Wolfson 2002; Pierro et al. 2006; Kramer and Yoon 2007; Otani et al. 2007).

Together, both the individual's affect and the situation, influence the individuals need to accomplish through regulating the type of goals chosen, the difficulty of those goals and the importance of achieving those goals (De Raad and Schouwenburg 1996; Frederick and Morrison 1999; Westenhoefer et al. 2004; Barnett 2006; Hannula 2006). This is not represented in the HMIEM and SDT unless it is implied through meeting the basic psychological needs of autonomy, competence and relatedness (Deci and Ryan. 2000; 2008; Vallerand, 2001; 2008). Once situational behaviour has a focus the individual can direct their effort towards these goals and plan a strategy to maintain performance intensity for the duration of the task or activity (Gendolla and Krüsken 2002; Linnenbrink and Pintrich 2002; Sniehotta et al. 2005; Bindarwish and Tenenbaum 2006). It should also be noted that if the individual is high in neuroticism, demonstrates high negative affect prior to an ego orientated situation, then the goals selected may be more related to an avoidance orientation rather than to accomplish a task (Biddle et al. 2003). This avoidance focus has been shown to manifest in higher levels of reported amotivation, which can lead to a reduction in motivation for that activity and a corresponding increase in negative affect whilst participating (Turnbull and Wolfson 2002). Eventually this combination of low motivational intensity and high negative affect, may result in the individual withdrawing their effort from performance either temporarily or permanently.

Hardy and Gustavo (2005) suggest that at the global level, motivation is sourced more through the individual's morals and values but at the situational level cognition and emotions may function as primary sources of motivation. Smith (2006) and Westenhoefer et al. (2004) suggest that increased negative affect may alter motivation, effort and performance altering the

immediate interpretation of the situation causing further fluctuation in performance. Barnett (2006), Chatzisarantis et al (2005), Jones (2003) and Rhodes et al (2006) agree that affect may influence the individual's decision to select and expend effort on an activity. Further literature agrees that initial positive and negative affective states experienced prior to performance are very influential on overall success or failure of performance (Ogden and Whyman 1996; Covassin and Pero 2004; Fazackerley et al. 2004; Papaioannou et al. 2004).

It could be that, as mentioned above, situational motivation is linked to a concept of motivational intensity; defined as a momentary magnitude of motivational arousal, where motivational arousal is actual behaviour (Brehm and Self 1989). Within this concept there is a need to regulate motivational intensity across periods of time (Brehm and Self 1989) dependant on the nature of the activity or task undertaken, how important it is to achieve that task and how much effort is needed versus how much effort is available to direct towards the activity or task. Therefore, it is suggested that task difficulty, coupled with immediacy of the task will influence affect which in turn will mediate motivational arousal for the task (Brehm et al. 2009). Furthermore, as the task progresses, the perceptions of task difficulty will alter, manipulating affect which may then change levels of motivational arousal causing fluctuations in situational motivation and intensity (Brinkmann and Gendolla 2007).

The proposed concept above takes into account the situational components of behaviour. However, the influence of individual characteristics may also alter behaviour. Individuals reporting high neuroticism scores have been found to experience situations more intensely (Robinson and Tamir 2005; Robinson et al. 2007; Buckingham 2008; Borja et al. 2009; Lahey 2009; Prinzie et al. 2009), and this is certainly the case where those situations are perceived as negative (Olson and Weber 2002; Deponte 2004; Robinson et al. 2005; Tamir 2005). Indeed high levels of neuroticism have been related with high anxiety (Judge and Ilies 2002). However, this should not be thought of as a debilitating relationship, as those reporting high neuroticism and using effective self-regulation skills have reported enhanced performance (Robinson and Tamir 2005; Tamir 2005; Barnett 2006;). Whilst self-regulation for these highly neurotic individuals may improve performance, it is still expected that as an activity becomes progressively more difficult, those high in neuroticism may show more fluctuation within their levels of situational motivation intensity.

The future direction for studying the process of situationally specific motivation will use original methodology to measure situational motivation, affect and goal accomplishment during

activity. Previous studies have only measured situational motivation immediately before and after activity. Furthermore, the literature does not suggest how long the concept of situational motivation lasts for. Where findings from study 1 and 2 have suggested that situational motivation is influenced by affect, this may result in short lived levels of motivation for that activity. All of the research to date has measured motivation before and after an activity, there is no research which maps motivation during an activity. Therefore, much of the literature discussing situational motivation can only allude to the processes occurring during performance.

In this thesis, recording motivational fluctuations within the situation or activity reflects a move away from measuring motivation only at the pre or post activity stage. The literature regarding both the type of motivation (quality) and the intensity of motivation (quantity) suggest that individuals demonstrating a high quantity of motivation outperform those individuals who have good quality but slightly less quantity of motivation (Lavigne et al. 2009; Vansteenkiste et al. 2009). This implies that using a measure of motivational intensity during performance could equate with the concept of quantity of motivation as this includes all types of motivation. Furthermore, the potential influence of affect on motivational intensity and the need to regulate this intensity throughout the duration of the activity (Brehm and Self 1989; Brehm et al. 2009) provides a link between situational motivation and regulation of performance.

If situational motivation is about directing effort and intensity towards performance (Heckert et al. 2000; Locke and Latham 2002; Moreira et al. 2002), it is anticipated that affect and goal striving also play a part in the regulation of performance. How the individual is feeling and what they intend striving towards during the activity, seem to be important indicators of performance (Elliot and Harackiewicz 1994; Wentzel 1999; Downie et al. 2006). Indeed the concept of goal discrepancy, where performers become more certain of goal success or failure as the activity progresses, can stimulate more effort if the goal is within reach or less effort if the goal is irredeemable (Donovan and Williams 2003; Schmidt and DeSchon 2007; Hatzigeorgiadis and Biddle 2008). However, for those less certain of goal achievement until the later stages of performance, increases in effort or motivational intensity may be too late to affect goal outcome (Kernan and Lord 1990; Gano-Overway 2008). Hence, this conception of situational motivation could be construed as part of an overall pacing strategy which is part of a self-regulatory process (Campion and Lord 1982). The pacing strategy, similar to motivational intensity, suggests that individuals must regulate their intensity and effort across the situation to ensure consistent performance and goal accomplishments (Venter 2008; Amodio 2009). As goal accomplishment

is linked to instances of increased positive affect it is expected that this would then serve to further enhance future performance (Kanfer and Ackerman 1996 in DeShon et al. 1996).

Progress towards a goal may also influence an individual's level of motivation towards that activity therefore, study 3 will also measure motivation using a perception of goal achievement during continuous activity to ascertain how this process of goal achievement and motivational profiles may influence performance in a competitive activity. Thus the focus for study 3 will include changes in goal progress, goal confidence and affect during an activity. This may help practitioners understand what influences motivational focus and intensity and at what point during performance the individual needs to use their internal self regulation strategies or when they may be more receptive to and in more need of external, positive and encouraging feedback to enhance performance.

## **5.0 Study 3 Situational motivational processes during cycling time trial performance**

### **5.1 Introduction**

Situational motivation is shown at the lowest level on the hierarchical model of intrinsic and extrinsic motivation (Vallerand 2000). Whilst there have been many studies assessing the interactions between levels of generality within the hierarchical model itself (Blanchard et al. 2007; Lavigne et al. 2009; Gillet et al. 2010), most of this has been carried out within a physical education environment and on young athletes (Prusak et al. 2004; Standage and Treasure 2002; Lonsdale et al. 2009) There have been few studies investigating the process, changes or influence of situational motivation on sports performance (Gao et al. 2011).

In study 2, situational motivation was measured in a non-competitive exercise activity and there were no opportunities for objective performance measures. Time trialling is a simple form of competition involving racing against a clock for an individual time. Cyclists usually race alone with no opportunity for drafting and therefore, trial time is a good indicator of an individual's performance. Jobson et al. (2007) found that laboratory time trials were ecologically valid when compared with real world cycle time trials. However, this study measures time trial performance over a 20 km distance and whilst actual cycle time trials are not ridden over this distance, many laboratory studies have used a 20 km time trial protocol to ensure a degree of novelty in time-trial studies which is often required in pacing studies (Thomas et al. 2011; Peveler and Palmer 2012; Renfree et al. 2012). Thus it was considered that using a time trial situation introduced an element of simple, individually-focused competition in which to assess the complex processes of situational motivation.

As discussed in the literature review, the HMIEM (Vallerand 2000) suggests that the basic tenets of self-determination theory hold true at three levels of generality, namely the global, contextual and situational level. Motivation is thought to arise from the desire to satisfy three basic psychological needs (e.g., competence, relatedness and autonomy) and is expressed as intrinsic motivation, extrinsic motivation or amotivation (Hein and Hagger 2007). After an individual carries out an action, they may experience change in levels of affect, cognition and future behaviour for the activity (Deci and Ryan 2008; Standage et al. 2008). These changes can include feelings of satisfaction which are related to intrinsic motivation; successful goal achievement which can include less self-determined extrinsic motivation; or confusion and

uncertainty when constantly failing to achieve goals which relates to amotivation. The HMIEM suggests that this process is identical at the global more persistent level, within different life contexts, and at the situational level of generality.

At the global and contextual levels of motivation, the individual's dominant motivational orientation is likely to influence their tendency to rely on different combinations of intrinsic motivation, extrinsic motivation and amotivation when approaching specific situations (Lavigne et al. 2009; Gillet et al. 2010). However, within a specific situation, the individual regularly evaluates the effects of their behaviour in relation to goal achievement and progress (Gernigon et al. 2004; Pierro et al. 2006). Where progress is not satisfactory, the individual may adapt their current strategy or choose an alternative strategy. Whilst this process occurs within contextual performance parameters, at the situational level of generality, strong and over-riding situational demands may require different motivational patterns from the general global and contextual motivational orientations usually displayed. Thus for short-term immediate goals, an individual's affective state would influence the perception and interpretation of situational task demands and the selection of a strategy for achieving immediate goals. This process could elicit a different affective response or strengthen the initial response based on the importance, difficulty and value of the goals and as such affect would be important for stimulating motivation at the situational level (Tubbs and Dahl 1991; Macdonald and Palfai 2008).

Goals are viewed as the major determinants of performance (Wright et al. 1994). The individual's interpretation and subsequent response to performance feedback at the situational level may operate on a feedback loop basis where progress towards their goal influences affect which in turn influences immediate goal variations and levels (Ilies and Judge 2005). This is similar to a process of self-regulation where the individual desires a future state and assesses the discrepancy between their current perceived state and the future desired state (Carver and Scheier 1982; 2002). Where the discrepancy is great and the value of the future state or outcome is high, the individual will demonstrate more motivation and effort directed towards attainment (Schmidt and DeShon 2007). However, Chang et al. (2010) found that too great a discrepancy coupled with a perception of slow progress towards a goal was negatively related to task satisfaction, expectations of success and thus persistence towards achieving a short-term goal. Wright et al. (1994) suggest that a simple measure of self-reported perceived goal progress helps develop an understanding of variation in performance, mainly because participants will have had to commit to a goal pre-performance and the self-report measure would reinforce this commitment. A similar measurement tool will be used within this study.

Perceived goal discrepancy can also influence the individual's affective state generating potential drive and effort towards the task or withdrawal of effort from the task (Locke and Latham 2004; Pierro et al. 2006; Levesque et al. 2008). Thus affect prior to performance is surmised to be important in explaining situational motivation processes. Furthermore, as part of the self-regulation of effort within a task, affect is thought to play a significant part in maintaining persistence and intensity in the short-term, i.e. during a task, providing important goal progress information. Where goal progress feedback is satisfactory, the individual is likely to experience increased positive affect (PA) in terms of feelings of satisfaction and goal attainment, aligning with intrinsic and extrinsic forms of motivation, or negative feelings where goal achievement requires considerably more effort in relation to perceived benefits (Taylor 1991). This study aims to investigate the factors related to situational motivation and their influence on cycle time trial performance.

It is hypothesised that i) situational motivation as measured using SIMS, will significantly change after riding the fastest time trial, more specifically intrinsic and extrinsic sources will increase and amotivation will decrease, ii) positive affect prior to the trial will be significantly higher for the fast trial compared to the slow trial, iii) negative affect prior to the trial will be significantly lower for the fast trial compared to the slow trial, iv) goal confidence will be significantly higher after riding a fast time trial compared with the slow trial, v) goal discrepancy scores will be greater for participants who perceive their time trial performance as successful compared with those who perceive their trial as unsuccessful, vi) situational motivation as measured using SIMS, will be significantly higher for those who perceived their time trial performances to be successful compared to those who perceived their time trial performances as unsuccessful, vii) those who perceive their time trial as successful will report significantly higher positive affect prior to time trial performance compared to those who perceive their trial as unsuccessful, viii) those who perceived their time trial as successful will report significantly lower negative affect prior to time trial performance compared to those who perceive their trial as unsuccessful.

## **5.2 Method**

### **5.2.1 Design**

This study used a repeated measures experimental laboratory-based design to collect data at regular intervals prior to, during and after a cycle time trial. Cyclists performed two laboratory-



based, self-paced time trials at least 2 days apart, to further examine changes in situational motivation

### **5.2.2 Participants**

After gaining university ethical approval for this study, six male athletes (age  $M=32\pm 13$  years) with recent experience of competitive endurance cycling, were recruited for this study. All cyclists were training a minimum of 5 times per week. Participants completed an informed consent form agreeing to prepare for each time trial performance as if it were a competition following usual pre-competition nutrition, hydration, training and recovery protocols and simulated competition preparation for warming-up on a cycle ergometer.

### **5.2.3 Procedure**

A repeated measures experimental laboratory-based study was conducted comprising frequent sampling of performance and psychological states prior to, during and following two 20 km time trial performances completed on separate days. The participants reported to the laboratory on two separate occasions and performed a self-paced 20 km cycle time trial on each visit. The time between each visit was a minimum of 2 days and maximum of one week (mean  $5\pm 2$  days) ensuring recovery time between trials. Prior to each trial participants simulated their usual warm-up for performance. Participants were asked to complete the trial as quickly as possible. They performed a 20 km time trial using their own bicycles mounted onto a Kingcycle ergometry rig (Kingcycle Ltd, High Wycombe, UK). The Kingcycle rig was calibrated using standard calibration procedures for the Kingcycle v6.7 software package. Data from the Kingcycle was displayed in real time on a computer screen in front of the participants simulating cyclists usual in-performance feedback. Data available to participants during their time trial included speed, time elapsed, percentage distance remaining. Heart rate data was also visible on a watch attached to the handlebars so as not to compromise hand position during cycling.

#### **Pre-time trial measures**

Immediately prior to warming up, participants completed a pre-test Situational Motivation Scale (SIMS; Guay et al. 2000) and separately recorded a minimum of one goal for the upcoming trial including a score for how confident they felt at this moment to achieve their goal (see appendix 5, pp217-219). Participants then reported their current positive and negative affect (NA) using the Worcester Affect Scale (WAS; Rhoden and West 2010).

### **During time trial measures**

At every 0.5 km during the time trial participants were asked to verbally report positive affect, negative affect, using the WAS (Rhoden and West 2010) and an RPE score whilst continuing to ride the time trial as fast as possible. Additionally, at 5 km, 10 km, 15 km and 20 km participants were asked to verbally report their perceived goal progress.

### **Post-time trial measures**

After completing the 20 km time trial and warming down, participants completed a post-trial SIMS, a post-trial WAS score and qualitatively evaluated goal progression and achievement using the open-ended questionnaire provided (see appendix 5, pp217-219).

## **5.2.4 Instrumentation**

### **Situational Motivation Scale (SIMS; Guay et al. 2000)**

The 16-item Situational Motivation Scale (Guay et al. 2000) is a measure of situational (or state) motivation toward a chosen activity. This self-report inventory contains four items per subscale and is designed to measure intrinsic motivation, identified regulation, external regulation, and amotivation. Responding to the stem, “*Why are you currently engaged in this activity?*” each item is rated on a 7-point Likert scale ranging from 1 (“*corresponds not at all*”) to 7 (“*corresponds exactly*”). Cronbach alpha coefficients range from .70 to .90 across diverse sample populations demonstrating reliability and validity (Standage et al. 2003a; Ward et al. 2008). Cronbach alpha for this study range from .67 to .79, although the identified regulation subscale returned an alpha of .20. Small homogenous samples, such as the sample in this study, are highly likely to return low alpha co-efficient values (Spiliotopoulou 2009; Maydeu-Olivares et al. 2010). The identified regulation subscale on the SIMS relates to a broad concept of valuing an activity and carrying it out even though it may be unpleasant (Guay et al. 2008). In the population sample for study 3, some participants may have valued a laboratory time trial performance whilst others may have perceived it to be of little value when compared to an actual time trial event. Spiliotopoulou (2009) and Maydeu-Olivares et al. (2010) agree that broad constructs are also more likely to return low alpha values. Despite the return of low alpha co-efficient scores, it is felt that inclusion of the extrinsic motivation for identified regulation subscale as part of this study was warranted as all these subscales are part of SDT and the scale has been previously validated with this subscale as part of the measure. Additionally, the

subscale enabled comparison of this data with the wider literature and the results of this study were interpreted in an appropriate and meaningful manner.

### **Worcester Affect Scale (WAS; Rhoden and West 2010)**

The WAS was developed within the hierarchical framework suggested by Watson and Clark (1997) to measure the non-specific higher order level of PA and NA rather than lower level affect descriptors, e.g. “*sad*”, “*joy*”. The positive scale required participants to rate how positive they felt “*right now*” on a 10-point likert scale (*1 = not at all positive; 10 = extremely positive*). The negative scale required participants to rate how negative they felt “*right now*” on a 10-point likert scale (*1 = not at all negative; 10 = extremely negative*). The WAS takes between 5-10 seconds to complete thus enabling measurement of affect at a high frequency sampling during activity.

### **Goals**

Participants were asked ‘*Have you set yourself a goal for this time-trial?*’ and were then prompted to report their goal or explain why they have not set a goal for this time-trial performance. At the post-trial measure, participants were asked open-ended questions relating to their perceptions of whether they were ‘*successful in achieving their goal*’ and whether they ‘*could have cycled faster*’ for that time-trial performance.

### **Goal confidence**

Participants were asked “*How confident are you in achieving your goal/s?*” prior to their time trial, at 5 km, 10 km and 15 km intervals during their trial and post-time trial performance. Responses were recorded on a 10-point Likert scale (*1 = not at all confident in achieving goal; 10 = extremely confident in achieving goal*).

## **5.2.5 Data analysis**

Analysis of data from small sample sizes can be carried out focusing on specific criteria within the data, similar to single case analysis (Kratochwill et al. 2013). The ensuing visual inspection of the data should follow a structured process whereby the researcher identifies an appropriate method for observing changes and similarities in individual data and repeats this process in the same way for all participants. There are six outcome-measurement features for examining the data which are: i) level – relating to overall averages between data points; ii) trend – suggests a best fit line through the data points; iii) variability – referring to the degree of change or

fluctuation; iv) immediacy of the effect – using linear time points to assess the previous factors; v) overlap – where the data points under comparison share similar values; and vi) consistency of data patterns across similar phases – suggesting stability of data points in a causal type relationship (Kratochwill et al. 2013). Parker and Vannest (2012) note that there are myriad designs undertaken in single case analysis, yet suggest that visual scrutiny of data is the most important aspect of that analysis and should be conducted in a methodical manner. Some of the individual data may not demonstrate effects for each measurement type and therefore, not all measures will be useful for analysing all participants. Thus whilst Kratochwill et al. (2013) suggest 6 measures, the analysis of this time trial data will focus on only 4 outcome measures namely; level, trend, variability and overlap. Data will be identified and compared by participant in line with best practice for this method of analysis.

However, non-parametric data analysis is acceptable for use with small sample sizes which may not conform to normally distributed population requirements for parametric analysis (Zendler et al. 2013). Thus, where obvious trends arise from the single case analysis which are deemed similar for all participants, further analysis will include use of non-parametric Mann Whitney-*U* to test for differences between trials and results will be accepted at the .05 level of significance. A Spearman's rank order test will be used to identify a relationship between trials. Whilst a *p* value is used to confirm probability, in small sample sizes variables with moderate to high correlations may not reach statistical significance. Therefore due to the small sample size for this study, the strength of the relationship will be determined using *r* values according to Cohen (1988) where a small effect  $r = .10-.29$ , a medium effect  $r = .30-.49$  and a large effect  $r = .50-1.0$ .

### **5.3 Results**

Analysis of situational motivation, positive and negative affect, goal confidence and the qualitative data will be provided by participant. Although this study used a small sample size, there are some trends in data which are noticeably evident across all participants and these will be presented at the end of the results section.

#### **Participant One (P1).**

Participant 1 achieved an 83 second faster time trial compared with their slow trial. Participant 1 also reported goal achievement for both slow and fast trials when comparing confidence to achieve goal levels (GC) between trials as post-trial responses for both trials was a maximum

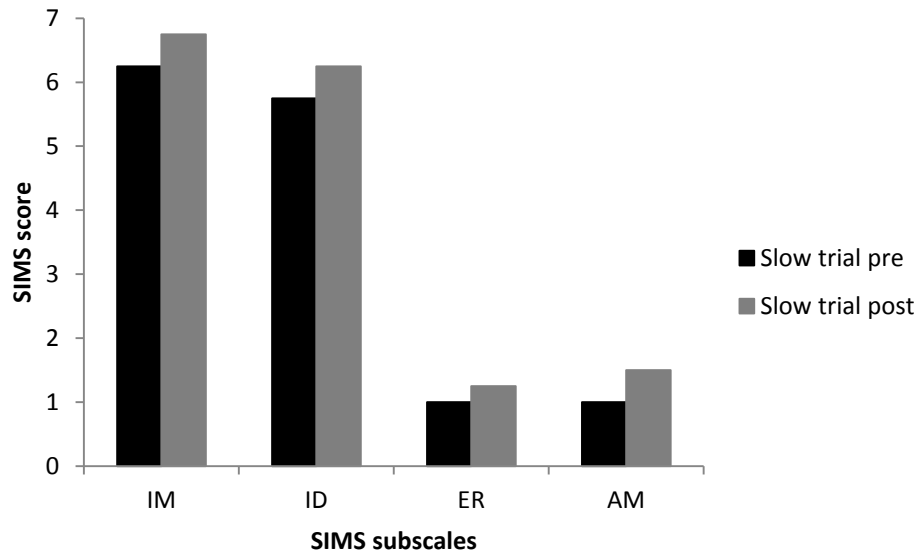
score of 10 (figures 5.3.1c-d). When comparing trends between trials the slow trial, pre-GC (4) was much lower than for fast trial pre-GC (7). Variability for the first half of each trial also differed, in the slow trial GC increased steadily, compared to the same period in the fast trial where GC firstly increased and then decreased. There was a definite overlap in scores from the halfway point in both trials, GC was reported as 8 in both trials and shared the same pattern and values, increasing towards the end to the maximum value (10). Although P1 reported after their slow trial that their goal was *'on reflection not challenging enough'* and for the fast trial that they *'could have gone faster'* (table 5.3.1), post-trial GC for both fast and slow trials suggest that P1 perceived they were successful in achieving their goals as GC was a maximum score of 10 for both trials.

Levels for the SIMS (figures 5.3.1a-b) across both trials shows intrinsic motivation (IM) is slightly higher than for identified regulation (ID) and both show near maximum values (range 6.25-6.75); external regulation (ER) and amotivation (AM) are reported as the lowest values recording a slight increase for both after the slow trial. The SIMS increases pre- to post-trial scores for the slow trial but this is not reflected in the fast trial SIMS scores which remain stable pre- and post-trial demonstrating some variability in SIMS between trials.

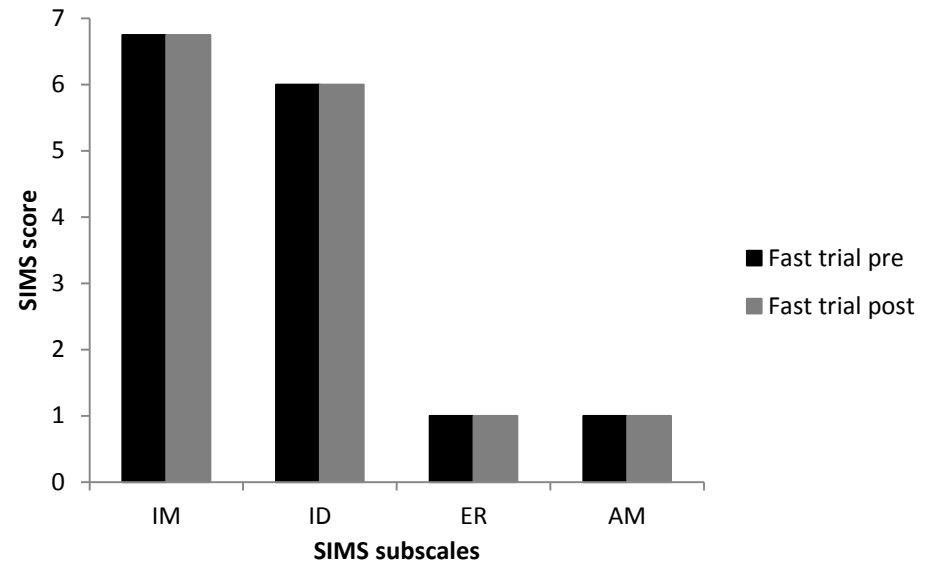
Positive affect (PA) for both fast and slow trials (figures 5.3.1c-d) start on the same values (8). However, during the first half of the slower trial PA scores are slightly lower than the fast trial. The last quarter of the slow trial shows that PA varies more than for the fast trial. Negative affect (NA) for both fast and slow trials, start and finish on the same values (2) demonstrating similar levels. In the fast trial there is a lot more variation in NA with peak values occurring at similar points during the trials; a peak of 4 for NA is reported between 10-12 km showing similar patterns for each trial.

**Table 5.3.1** Goals and qualitative data for participant one for slow and fast time-trials.

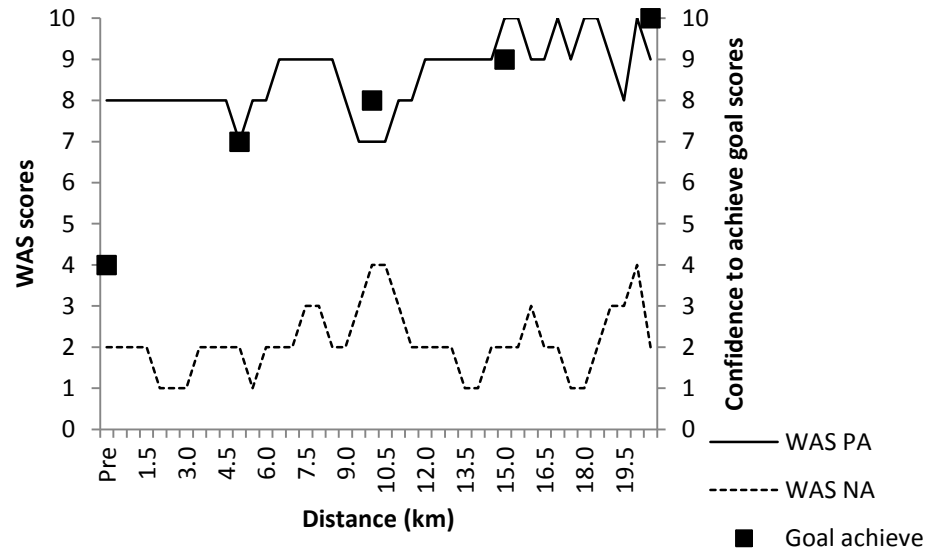
Participant 1	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'To push hard and aim for 40 minutes'.	1970	'Monitor speed and HR to prevent blowing up'.	'On reflection not challenging enough'. Positive, relaxed and comfortable.
Fast Trial	'To beat previous time... or achieve 32 minutes'.	1887	'Monitor HR and power'.	'Could have gone a little faster' Positive, relaxed, motivated, focused.



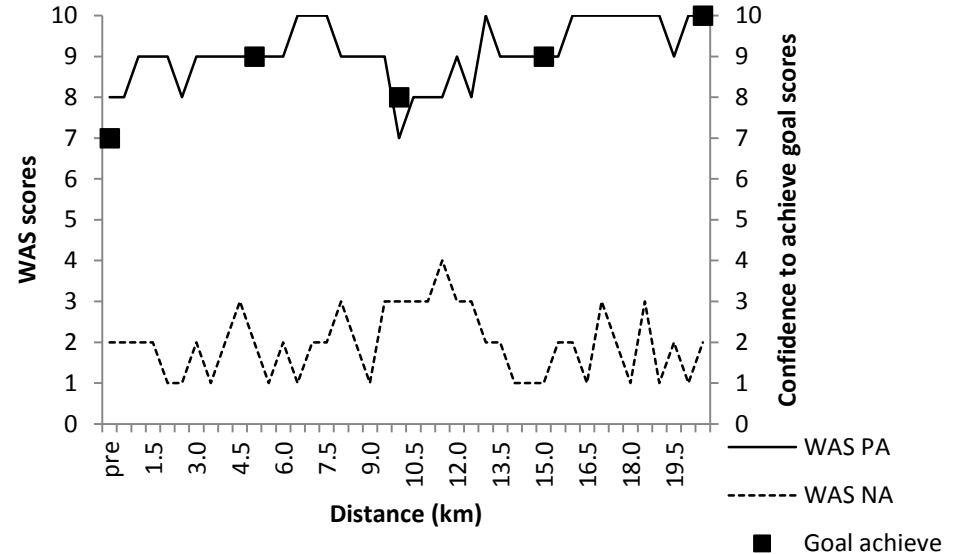
**Figure 5.3.1a** SIMS scores pre- and post- slow trial for P1.



**Figure 5.3.1b** SIMS scores pre- and post- fast trial for P1.



**Figure 5.3.1c** WAS and confidence to achieve goal scores pre- and post-slow trial for P1.



**Figure 5.3.1d** WAS and confidence to achieve goal scores pre- and post- fast trial for P1.

## Participant 2 (P2).

Participant 2 achieved a 36 second faster time trial compared with their slow trial. Levels of GC (figures 5.3.2c-d) follow similar patterns for both trials starting at the same level (7) but the pattern during the fast trial shows GC as more pronounced (range 5-10) dropping further and rising higher than for the slow trial (range 6-9). Although there was similarity between the patterns of GC there were only two measurement points of overlap between the fast and slow trials which occurred prior to and half way through both trials suggesting difference in reported scores. However, P2 reported after both trials that they '*could have gone faster*' (table 5.3.2) whereas post-trial perceptions of success measured through post-trial GC, suggests that the fast trial was perceived as successful (GC=10) and the slow trial only partially successful (GC=9). Perceptions of success for P2 was not reported as maximum for trial 1, their slow trial but their fast trial (trial 2) was reported as successful as they knew this was the faster trial and they had achieved their goal.

Levels for the SIMS (figures 5.3.2a-b) across both trials show ID to be slightly higher than IM with ER and AM lower. However at the end of the slow trial and prior to the fast trial AM levels are slightly raised. IM decreases after the slow trial whilst ER and AM increase. After the fast trial IM and ID increase with a decrease in AM.

PA for both fast and slow trials (figures 5.3.2c-d) start at the same value (7), although PA in the slow trial (range 5-8) does not vary as much as PA in the fast trial (range 6-10) which tends to generally increase throughout the trial. NA for both trials is also reported as the same value (4), however, in the slow trial the trend for PA remains high (range 3-6). NA for the fast trial fluctuates more (range 2-6) during the trial although the peak value occurs within the last 2 km at the end of the fast trial.

**Table 5.3.2** Goals and qualitative data for participant two for slow and fast time-trials.

Participant 2	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'To achieve under 30 minutes'	1757	'To go all out... monitor breathing rate and how the legs feel'	'Could have gone faster'. Under powered, happy, content, struggling, exerted, motivated.
Fast trial	'To do better than 29 minutes 17 seconds for trial 1'	1721	'Monitor time, speed and breathing rate'	'Cadence and gear selection much improved... [goal] not challenging enough...could have gone faster'. Happy, content, satisfied, motivated, encouraged, eager.

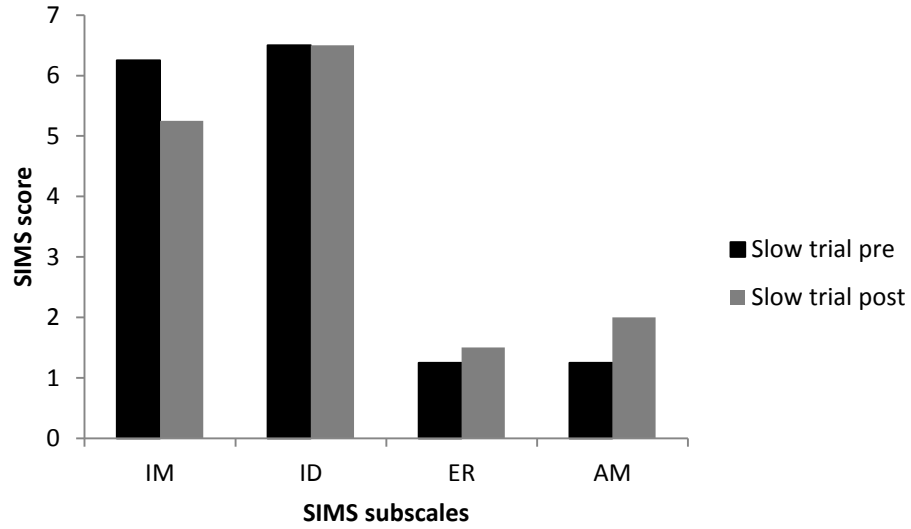


Figure 5.3.2a SIMS scores pre- and post- slow trial for P2.

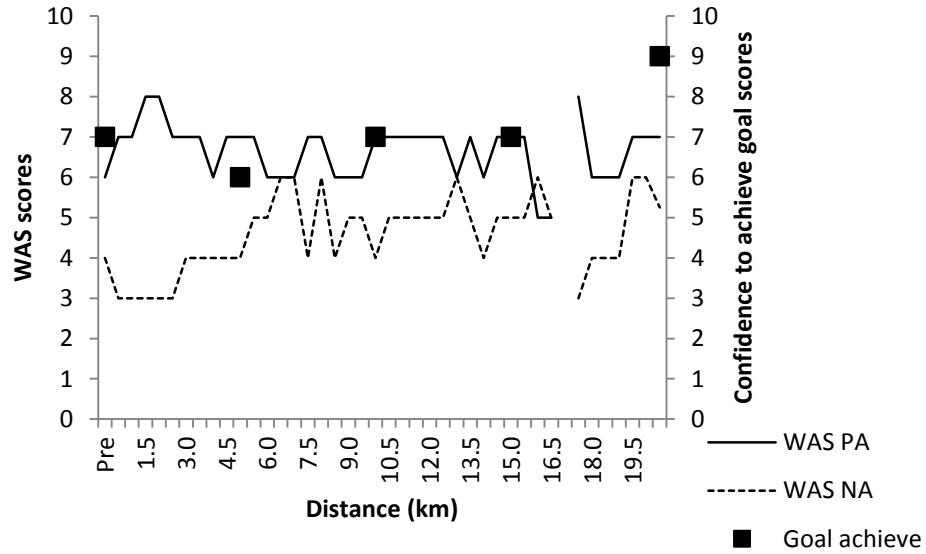


Figure 5.3.2c WAS and confidence to achieve goal scores pre- and post-slow trial for P2.

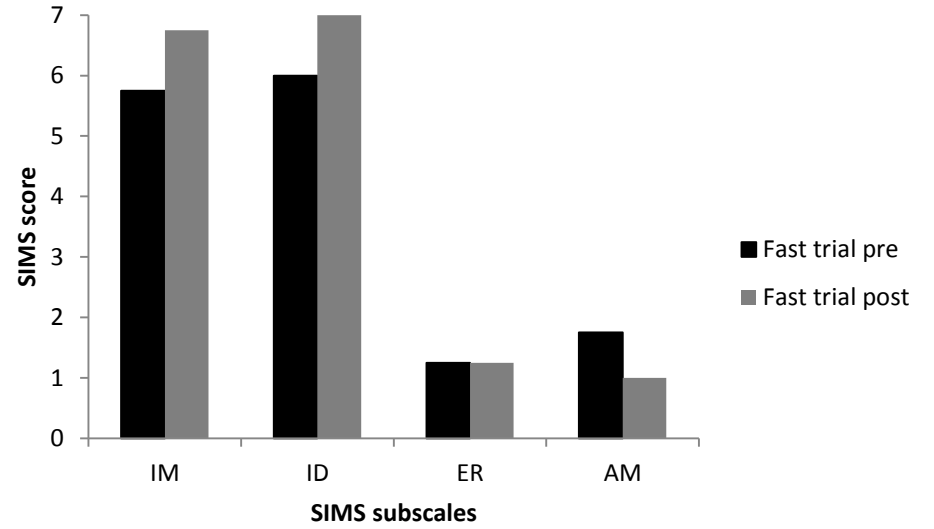


Figure 5.3.2b SIMS scores pre- and post- fast trial for P2.

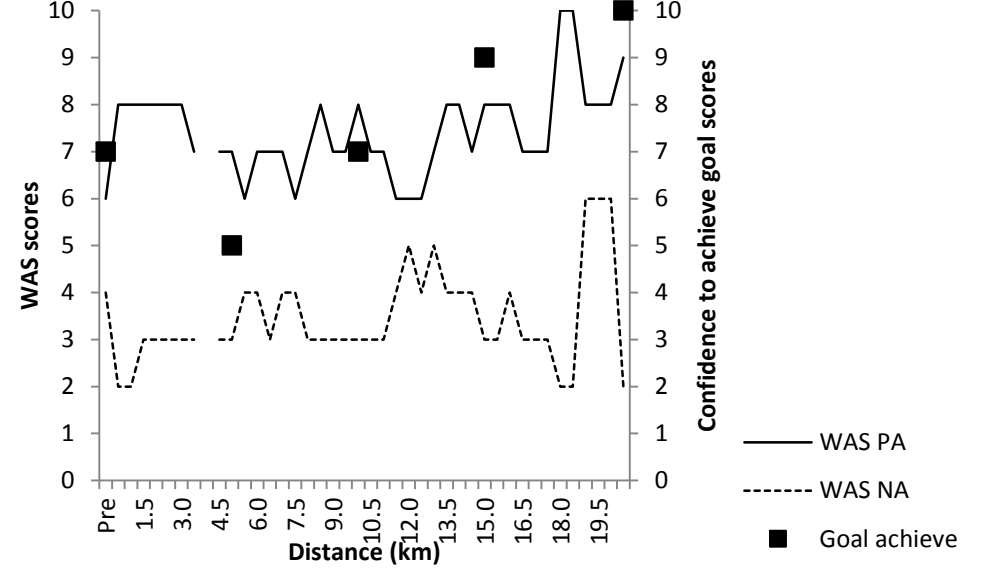


Figure 5.3.2d WAS and confidence to achieve goal scores pre- and post- fast trial for P2.



### Participant 3 (P3).

Participant 3 achieved a 56 second faster time trial compared with their slow trial. P3 reported GC (figures 5.3.3c-d) started slightly lower (8) prior to the fast trial but then remained at the maximum (10) score for the remainder of the trial. This was different to the slow trial where P3 starts at the maximum GC then reports decreasing scores until they report the lowest GC (1) from 15 km until the end of the trial. After the fast trial P3 reports that *'I went to fast too early and at the end I could not hold it'* (table 5.3.3). However, after the slow trial P3 acknowledges that the goal was *'too challenging'* and *'recalculated the goals part way through'*, verbal feedback from P3 post-trial suggests that they carried on reporting GC and other measures for the original goal and not the recalculated goal during this trial. Perceived success for P3 was only reported post-trial GC for the fast trial (10) whereas the slow trial was definitely not perceived as successful (GC=1). Perceptions of success for P3 shows that after their fast trial they achieved success but not after trial 2 their slow trial. P3 knew that they had ridden their slowest trial after trial 2 but did not know they had ridden their fastest trial after trial 1.

SIMS scores (figures 5.3.3a-b) showed that P3 reported a motivation profile where IM is relatively low (range 2.5-3.5) and ID is somewhat higher (range 4.75-5.25). ER scores decreased pre- to post-trial for both trials, however, AM scores increased slightly pre- to post-trials. After the fast trial, for both the pre- and the post-responses, P3 reported quite high levels of AM (pre-trial 4, post-trial 4.25).

PA for the fast trial (8) starts at a slightly lower level (figures 5.3.3c-d) than for the slow trial (9) and there is only overlap between the two trials for PA in the first quarter of the time trial. During the fast time trial PA increases until it is at maximum from half way until the end, whereas for the slow trial PA decreases slightly. NA for the fast trial (2) starts just higher than for the slow trial (1) but during and for the remainder of both fast and slow trials NA remains at the lowest score possible (1).

**Table 5.3.3** Goals and qualitative data for participant three for slow and fast time-trials.

Participant 3	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'To beat 27 minutes 49 seconds'	1725	'Monitor power or EPOCH from watch'.	'[On reflection] goal was too challenging... I recalculated goal part way through'. Determined, focused, challenged, interested.
Fast trial	'To achieve a time of 30 minutes 38 seconds'	1669	'Monitor power and HR zones...build HR to 148 then 160 at end... watts at 240'. '[goal was] not challenging enough'	'Went too fast too early and at the end I could not hold it'. Pleased, tired legs, hard work, positive, motivated, determined.

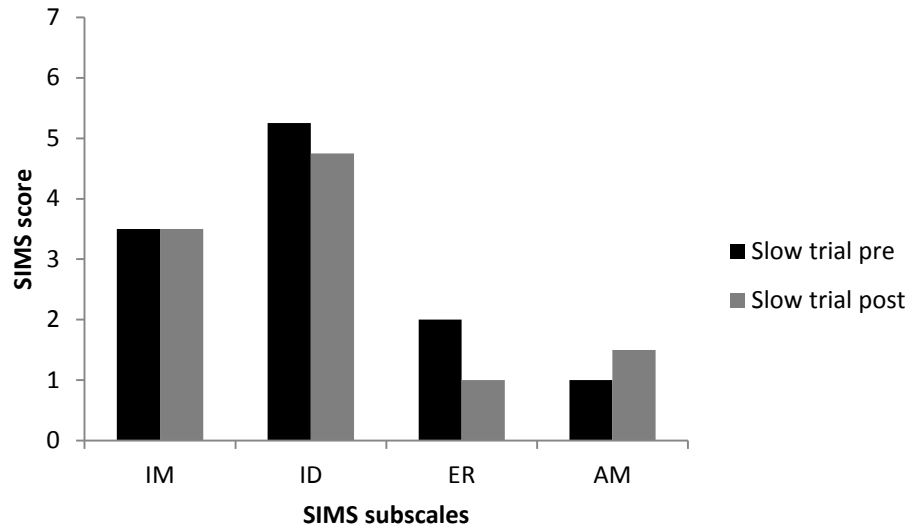


Figure 5.3.3a SIMS scores pre- and post- slow trial for P3.

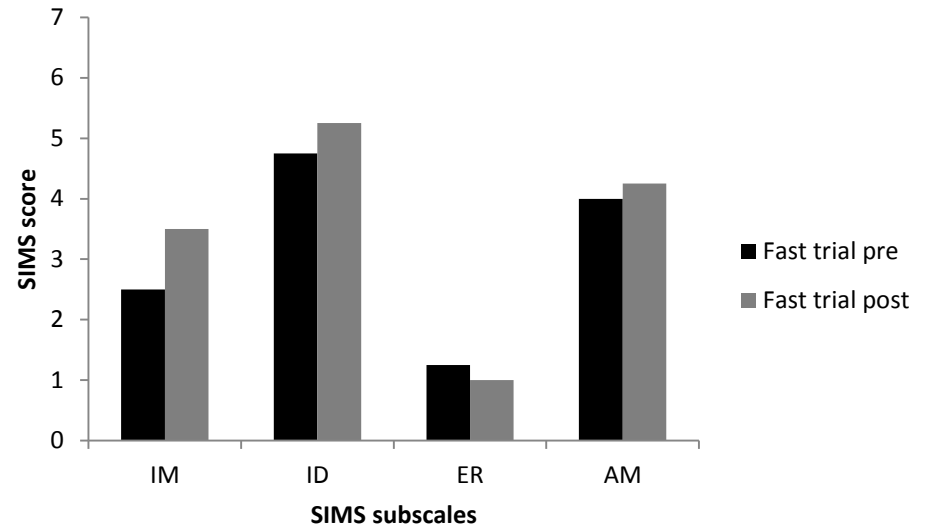


Figure 5.3.3b SIMS scores pre- and post- fast trial for P3.

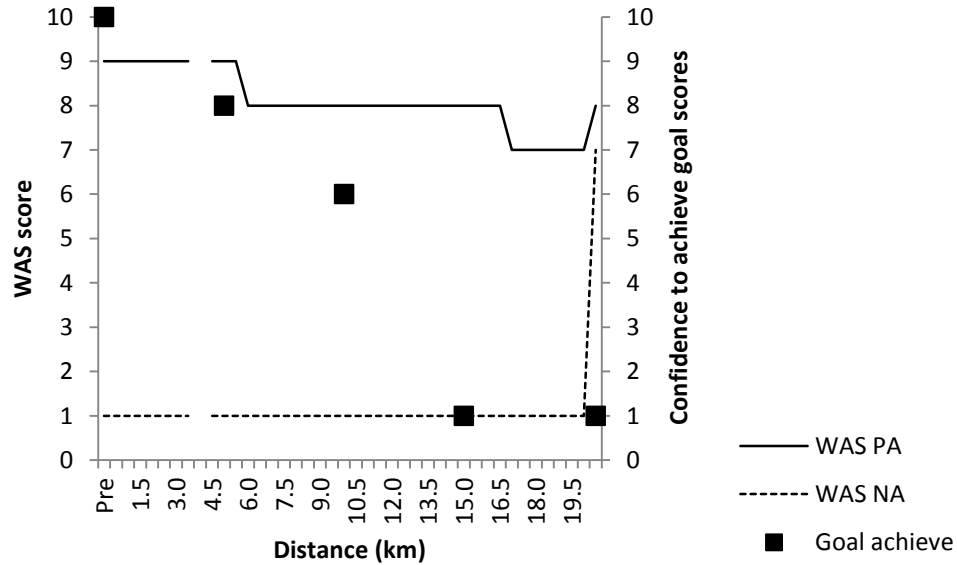


Figure 5.3.3c WAS and confidence to achieve goal scores pre- and post-slow trial for P3.

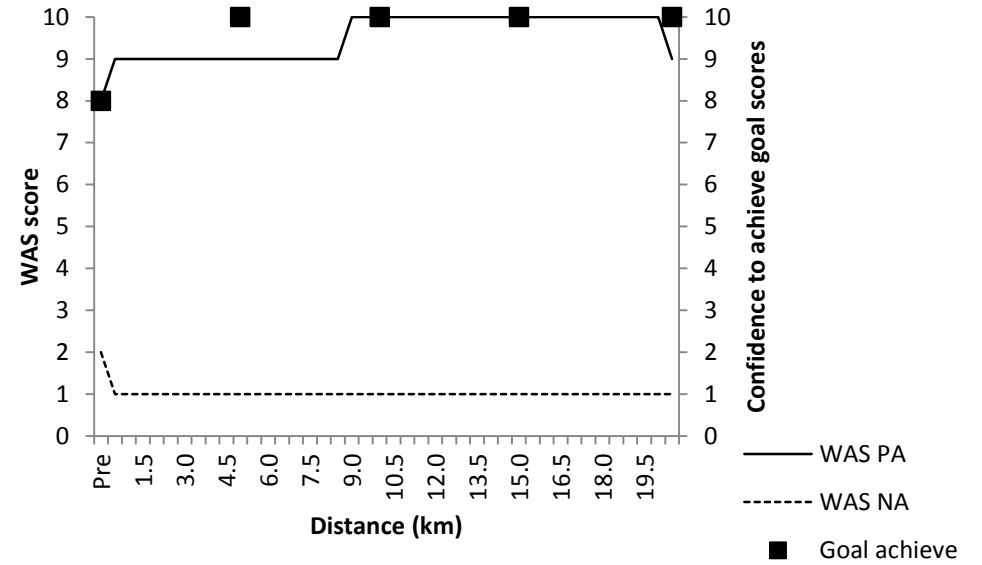


Figure 5.3.3d WAS and confidence to achieve goal scores pre- and post- fast trial for P3.

**Participant 4 (P4).**

Participant 4 rode their fast trial 110 seconds faster than their slow trial. GC (figures 5.3.4c-d) in the first half of both fast and slow trials GC is very similar rising quickly to maximum values (10) although for the fast trial GC was reported higher (8) than the slow trial (7) prior to the start of the time trial. After half way through each trial, GC scores for both trials separate; fast trial GC remains at maximum levels throughout the trial whereas slow trial GC decreases at each measurement point finishing at the same value it started (7). At the end of both trials P4 states *'I could have gone faster/harder'* and the goal was *'challenging'*, however, P4 does report perceived success after the fast trial (GC=10) and only partial success after the slow trial (GC=7). Perceptions of success for P4 shows that after their fast trial they perceived themselves as successful. P4 rode their fastest trial in trial 2 therefore they knew this was their fastest trial and that they had achieved the goals they set.

Prior to both the fast and slow trials, IM scores were reported as lower than ID scores (figures 5.3.4a-b) with both ER and AM being reported as the lowest values (1) pre- and post- both trials. After the slow trial there was a large increase in IM post-trial (pre-5, post-6.75) whereas IM for the fast trial decreased slightly. ID also decreased slightly pre- to post- fast trial (pre-5.75, post-5.25).

PA started and finished slightly lower (figures 5.3.4c-d) for the slow trial (pre-7, post-9) compared to the fast trial (pre-8, post-10). Whilst the pattern of PA for both trials is similar, slow trial PA increases at a slower rate than for the fast trial. NA for the slow trial (pre-3, post-9) starts and finishes higher than for the fast trial (pre-2, post-1). NA in the slow trial fluctuates more in the second half of the trial, whereas NA in the fast trial does not fluctuate as much and mainly in the first half of the time trial.

**Table 5.3.4** Goals and qualitative data for participant four for slow and fast time-trials.

Participant 4	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'To find a maximal sustainable pace'.	1924	'Monitor how I feel, HR zones and RPE... picking up the pace between 10-15 minutes to go'.	'I could have gone faster...seeing end power output...could have sustained higher pace throughout... goal was reasonably challenging'. Strong, happy, excited, apprehensive, alert, motivated.
Fast trial	'To beat 32 minutes 4 seconds'.	1814	'Monitor through HR perceived effort, watts and negative splits'.	'Could have gone harder especially as it was so close to 30 minutes... focused on distance to go and not time... more focused to achieve and better prepared... [goal was] challenging enough'. Strong, fit, determined, interested, concentrated, active.

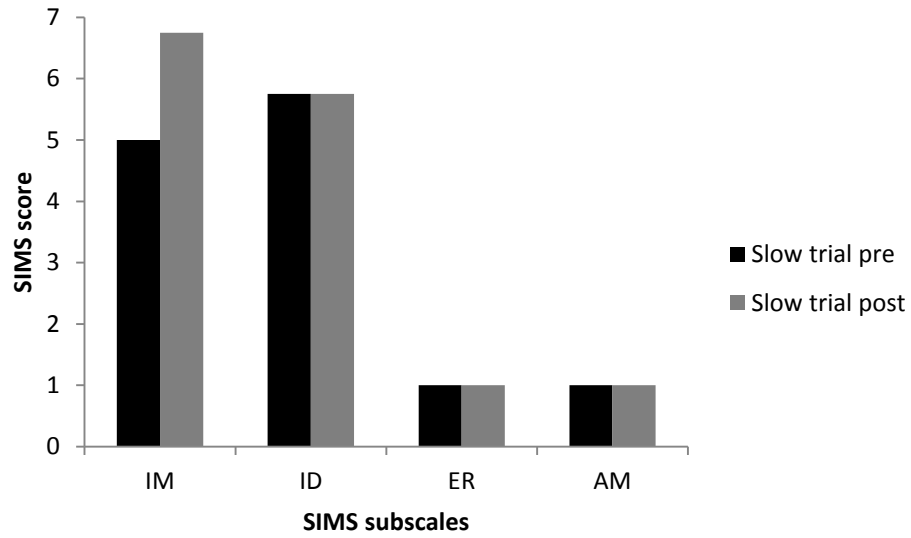


Figure 5.3.4a SIMS scores pre- and post- slow trial for P4.

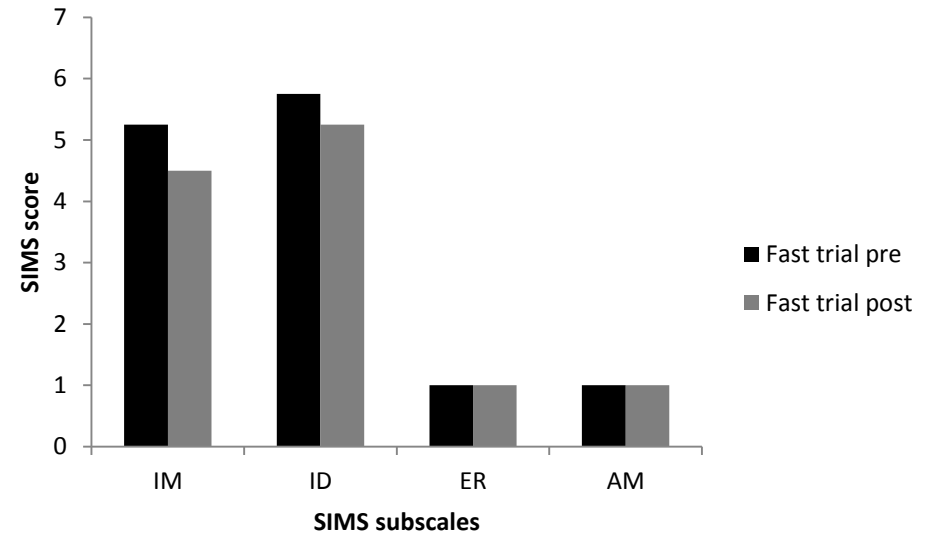


Figure 5.3.4b SIMS scores pre- and post- fast trial for P4.

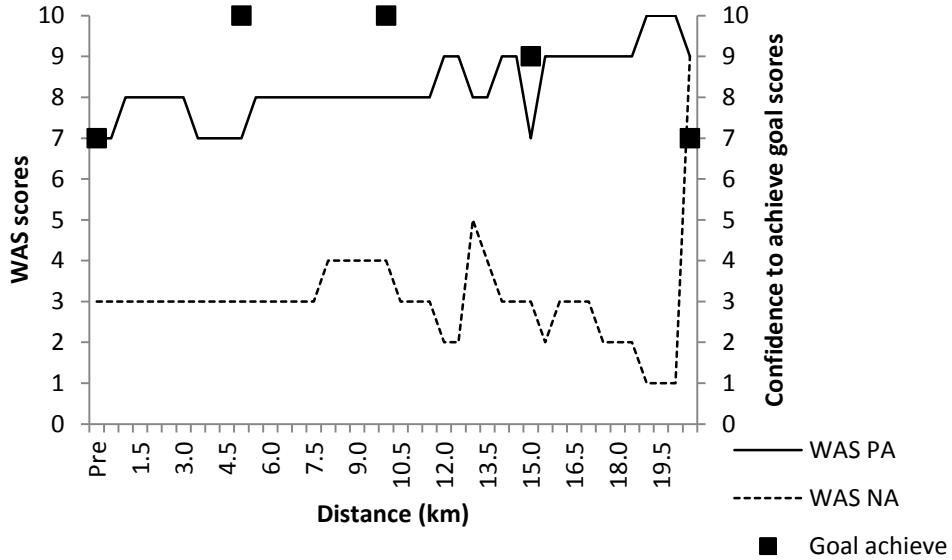


Figure 5.3.4c WAS and confidence to achieve goal scores pre- and post-slow trial for P4.

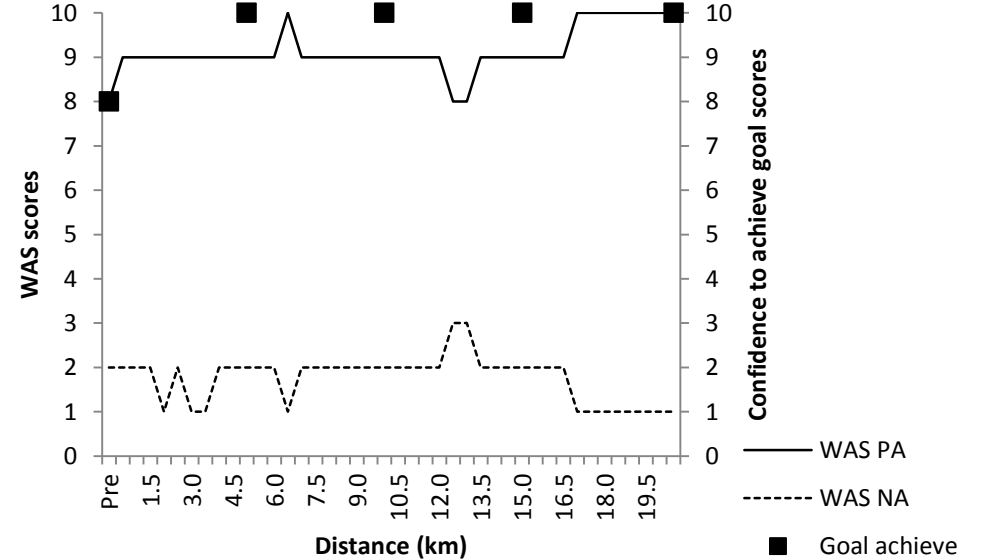


Figure 5.3.4d WAS and confidence to achieve goal scores pre- and post- fast trial for P4.

### Participant 5 (P5).

Participant 5 rode 85 seconds faster in their fast trial compared with their slow trial. P5 reported that they '*could have gone faster*' in their slow trial however, after their fast trial P5 stated '*could not go faster because I was tired*' (table 5.3.5). GC for the slow trial did not fluctuate (figures 5.3.5c-d) much starting at the highest value (10) and reporting this continually until the final measurement point at 20 km (9). The fast trial GC seemed less certain, changing more frequently and started lower than for the slow trial (8) steadily increasing through to maximum at the half way point with a slight decrease before a final maximum value score at the end (10). Perceived success for P5 was reported after the fast trial (GC=10) and although GC scores suggested that the slower trial was perceived as successful for most of its duration, the final perception was that the slow trial was only partially successful (GC=9). Perceptions of success measured through post trial GC for P5 suggests that they perceive themselves as successful after the fast trial but not for the slow trial. P5 rode their fastest trial in trial 2 therefore knowing that this was their fastest and they had achieved their goal.

The scores for SIMS generally showed similar patterns (figures 5.3.5a-b) whereby IM was slightly lower than ID with EM being lower still and AM the lowest reported score. However, this pattern was more pronounced in the fast trial SIMS scores with both pre- and post- IM (pre-3.25, post-4.25) scores remaining lower than those recorded for the slow trial (pre-5.25, post-5.25). Across both trials ER increased to similar scores (fast trial post ER-2.5, slow trial post ER-3) however, the fast trial showed the greater increase (pre- 1, post- 2.5) compared to the slow trial (pre- 2.5, post- 3).

PA starts higher and finishes lower (figures 5.3.5c-d) for the slow trial (pre-9, post-9) than for the fast trial (pre-8, post-10) although during the slow trial PA is reported as slightly less for the majority of the trial (8) than the similar period during the fast trial (9), PA is fairly stable across both trials. NA across both trials is reported as the same pre- to post-trial (1). However, during the slow trial NA is higher (range 1-4) than for the fast trial (range 1-2). NA for the slow trial only drops to pre-trial values during the last quarter of the time trial. NA for the fast trial is relatively stable with little change whereas during the slow trial NA fluctuates more.

**Table 5.3.5** Goals and qualitative data for participant five for slow and fast time-trials.

Participant 5	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'Ride to the end in a respectable time or achieve my capabilities'.	2183	'Monitor through HR and RPE'.	'Could have gone faster... [level of goal challenge] spot on...could have raised RPE earlier'. Challenging, commitment, goal, positive, failure, competitive.
Fast trial	'To beat 36 minutes 23 seconds'.	2098	'Monitor HR'.	'Could not go faster because I was tired... goal was very challenging'. Focus, endurance, achieve, goal setting, nervous, positive.

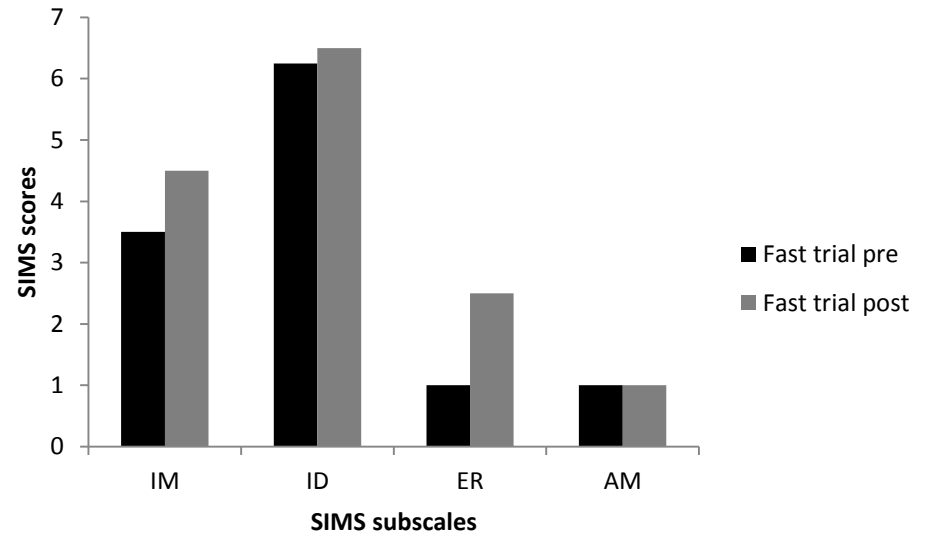
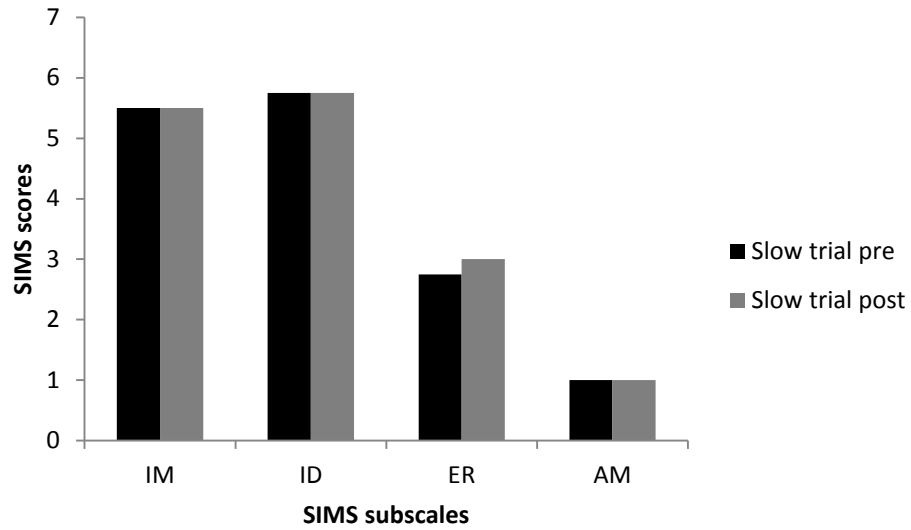


Figure 5.3.5a SIMS scores pre- and post- slow trial for P5.

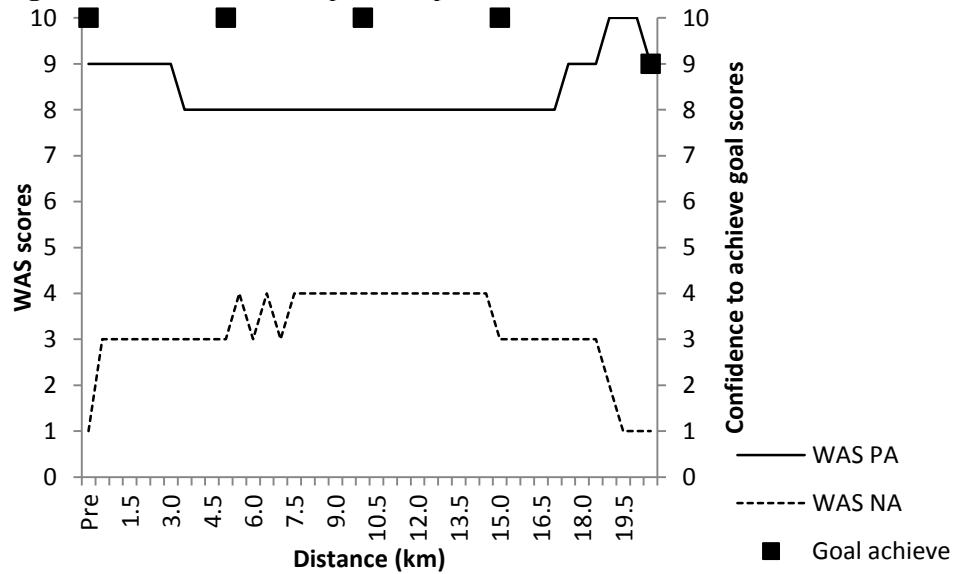


Figure 5.3.5c WAS and confidence to achieve goal scores pre- and post-slow trial for P5.

Figure 5.3.5b SIMS scores pre- and post- fast trial for P5.

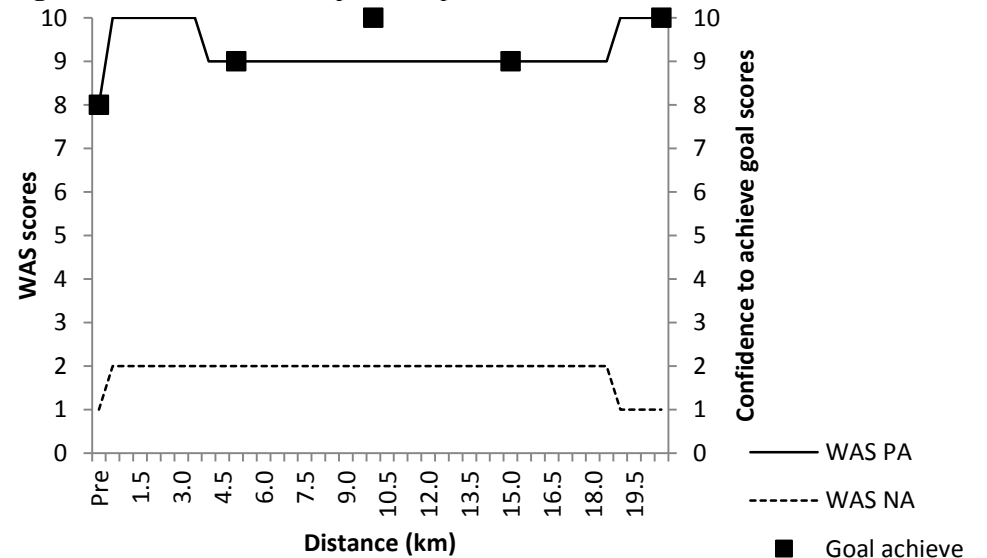


Figure 5.3.5d WAS and confidence to achieve goal scores pre- and post- fast trial for P5.

### Participant 6 (P6).

Participant 6 achieved a 40 second faster time trial compared with their slower time trial. Pre- GC for both trials (figures 5.3.6c-d) was relatively low (slow trial 6, fast trial 7) and both trials showed different GC patterns. The slow trial GC gradually decreased finishing at the lowest possible score (1) whereas the fast time trial GC remained fairly constant with some small fluctuation from half way finishing at a slightly higher score (8). In the fast trial P6 reported that they *'could have cycled faster'* (table 5.3.6), however, after the slow time trial final reflections focused on the tiredness felt, *'... could not increase leg power...kept dropping the pace...'*. The consistently low scores and slight fluctuation in GC (range 6-8) for the fast trial could be a result of P6 thinking they had *'...gone out too hard...'*. after the fast trial P6 reported only partial perceptions of success (GC=8) and the slow trial was not perceived as successful (GC=1). Perceptions of success measured through post-trial GC, for both trials indicated that P6 perceived they were not successful even after they actually achieved the goals they set for themselves in their fast trial. P6 rode their fastest trial in their first trial and as with all participants, had set a pre-trial 2 goal to beat their previous time thus P6 knew their second trial was slower, however P6 did not know that their first trial would be their fastest.

Due to incomplete questionnaire data, SIMS scores for post- fast time trial were not reported. However, slow time trial SIMS data (figures 5.3.6a-b) shows IM to be slightly lower (5) than ID (5.25) with ER the lowest score (1) and AM slightly higher (1.5). Post-slow trial ID increased fractionally (pre-5.25, post-5.5). Prior to the fast time trial P6 reported similar levels of IM and ID (5.5) and the lowest possible scores for both ER and AM (1).

PA was lower for the slow trial (figures 5.3.6c-d) prior to during and after the trial (range 6-2) compared with the fast trial (range 6-8). Furthermore, PA in the slow trial decreased regularly at each measurement point throughout the trial whereas in the first half of the fast trial PA remained constant before fluctuating and then increasing towards the end. NA started higher prior to the slow trial (4) than prior to the fast trial (3). During the slow trial although NA fluctuated it was mainly increasing finishing at a relatively high score (8). For the fast trial NA did fluctuate more increasing to a maximum score of 4 but then decreased to a relatively low score (2) at the end of the trial.

**Table 5.3.6** Goals and qualitative data for participant six for slow and fast time-trials.

Participant 6	Goal	Time achieved (seconds)	Strategy	Post-trial reflection and feelings
Slow trial	'To beat 27 minutes 52 seconds'.	1712	'Monitor HR related zone, maintaining a steady pace with increased speed towards the end...maintain power output just above previous average'.	'Legs felt tired and did not feel powerful... poor performance... could not increase leg power... kept dropping the pace, I was not expecting this'. Disappointed, tired, fatigued, slow, poor, unexpected.
Fast trial	'To maintain a fast but sustainable pace'.	1672	'Maintaining target HR range... and reach max effort by the end'.	'Could have cycled faster...went out too hard in the first 5 minutes... poor pace to start with but positive about the pace for the rest... maintained consistency... [goal was] challenging enough'. Happy, positive, max effort, tiring, enjoyable, achievement.

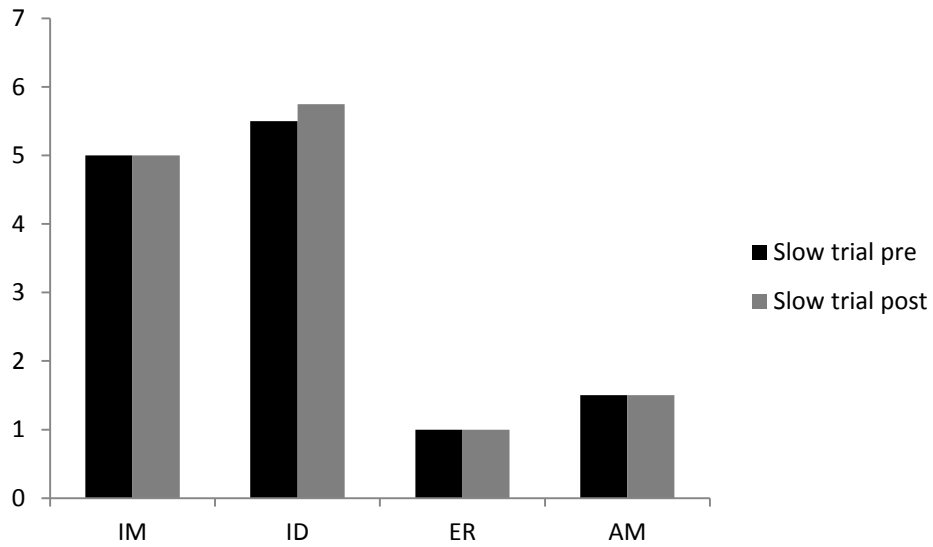


Figure 5.3.6a SIMS scores pre- and post- slow trial for P6.

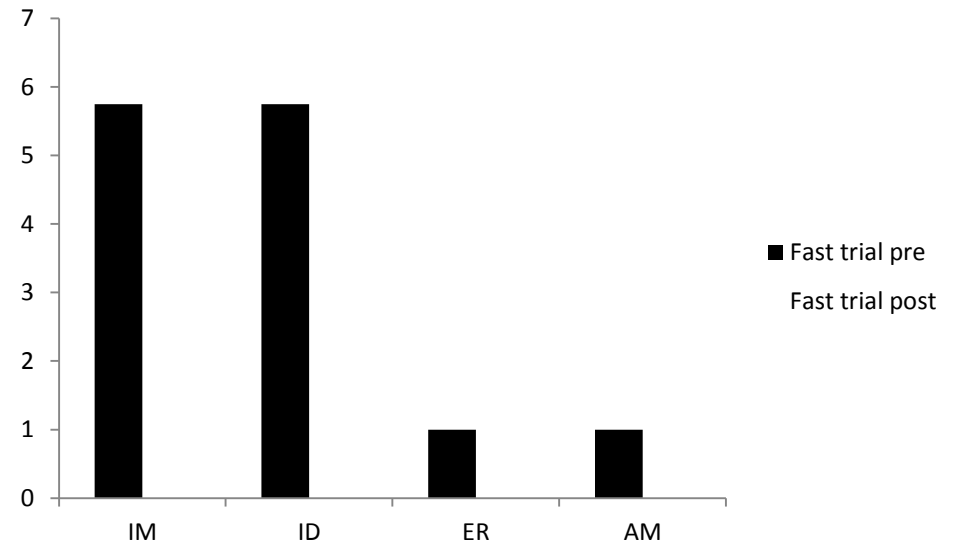


Figure 5.3.6b SIMS scores pre- and post- fast trial for P6.

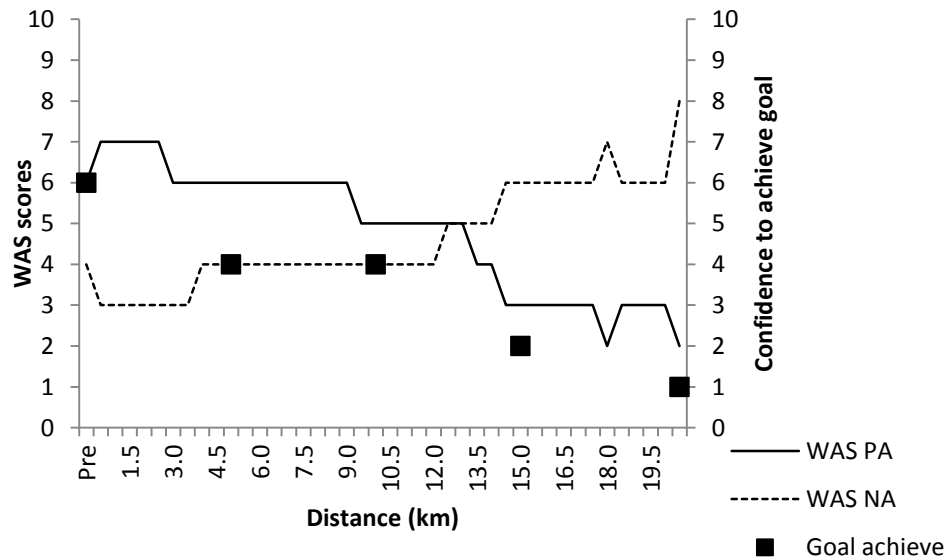


Figure 5.3.6c WAS and confidence to achieve goal scores pre- and post-slow trial for P6.

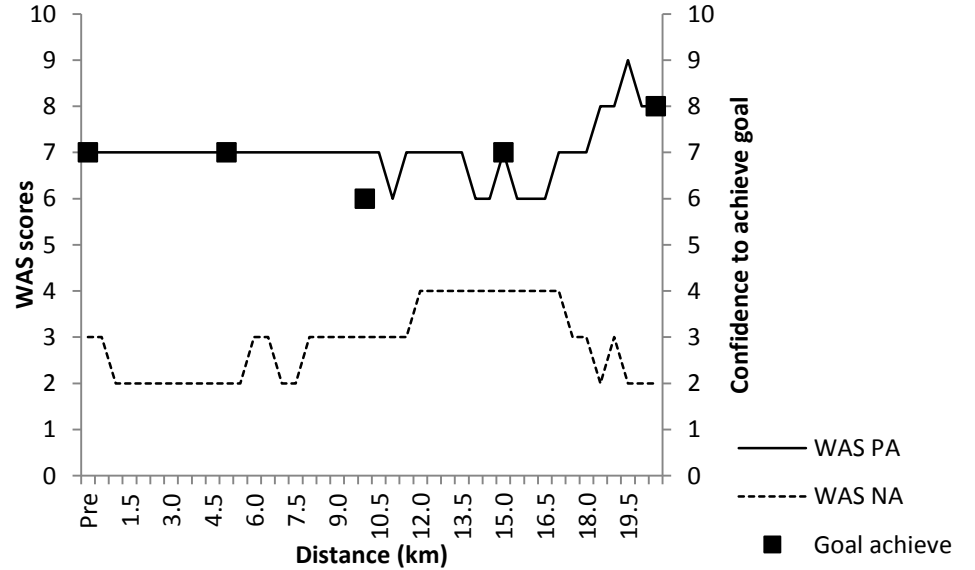


Figure 5.3.6d WAS and confidence to achieve goal scores pre- and post- fast trial for P6.



### **Intra- participant trends.**

Focusing specifically on trends within the data for this study, two distinct qualities were noted. Firstly, there seems to be a tendency for PA to be generally lower and NA generally higher in the slower trials compared to the fast trials. Although patterns may be similar, there is less differentiation between PA and NA during slower trials, with scores gravitating towards the middle of the graphs. This effect is more noticeable when observing a decrease in PA during slow trials. Secondly, the GC and the PA for the fast trials seem to follow a similar patterns in the fast trials. In many cases the GC and PA data points share the same values at each measurement point, where this does not occur the pattern of GC response is reflective of PA scores. Although the sample size for this study was limited, these tendencies are quite distinct as to be noticeable using observational analysis. Therefore it was decided to further analyse these trends across the time trials using a non-parametric Mann Whitney-*U*.

Results from the Mann Whitney-*U* show that PA was significantly higher (figure 5.3.7) in the fast trial compared with the slow trial pre-, during and post-trial ( $p = .001$ ,  $z = -5.652$ ) and that NA was significantly lower in the fast trial (figure 5.3.8) compared with the slow trial pre-, during and post-trial ( $p = .001$ ,  $z = -5.652$ ).

A Spearman's rank order correlation between GC and PA in the fast trial (figure 5.3.9) show that there is a strong positive correlation ( $r = .821$ ,  $p = .089$ ) between these two variables, however, this did not achieve significance possibly due to the small sample size and number of data points available for correlation (5). By comparison there was only a small negative correlation between GC and PA in the slow trial (figure 5.3.10) which again did not achieve significance ( $r = -.132$ ,  $p = .833$ ).

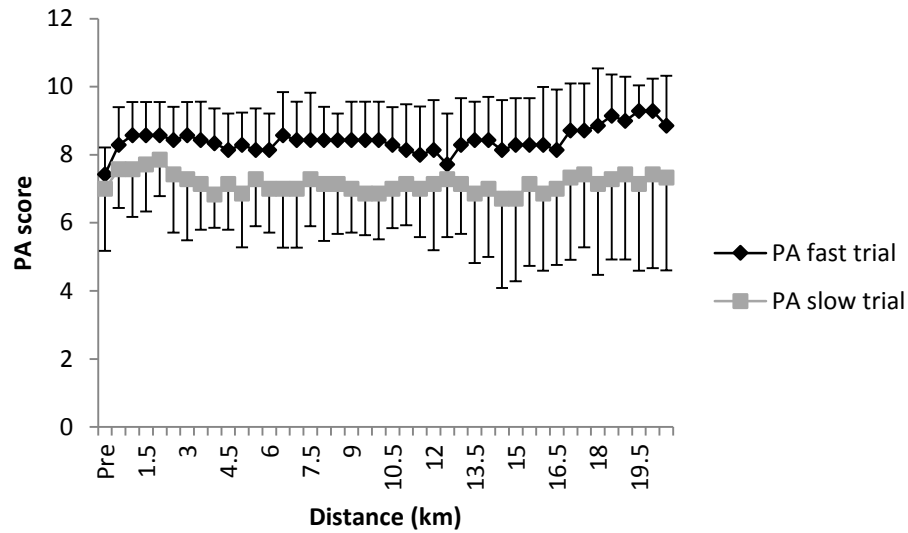


Figure 5.3.7 Differences between all participants fast and slow trials for PA.

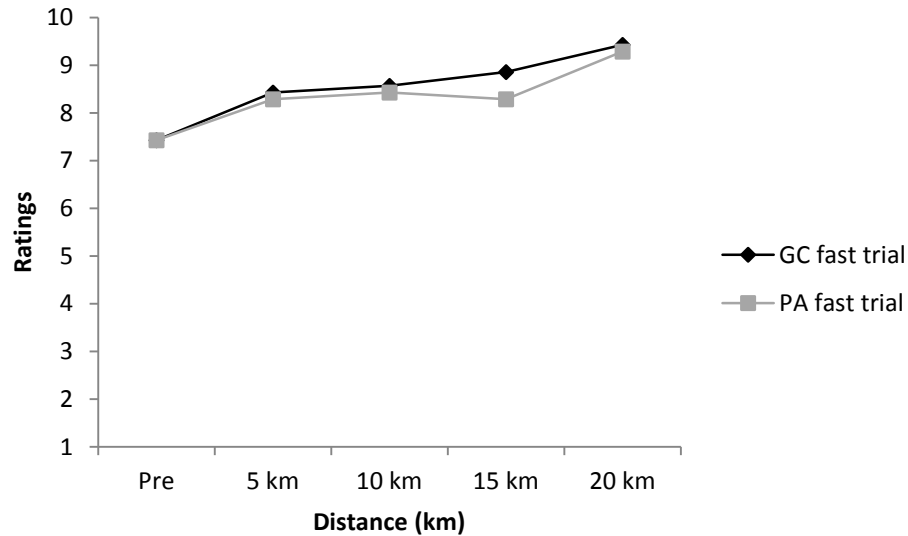


Figure 5.3.9 Relationship between GC and PA in the fast trial only.  $r = .821$ ,  $p = .089$ .

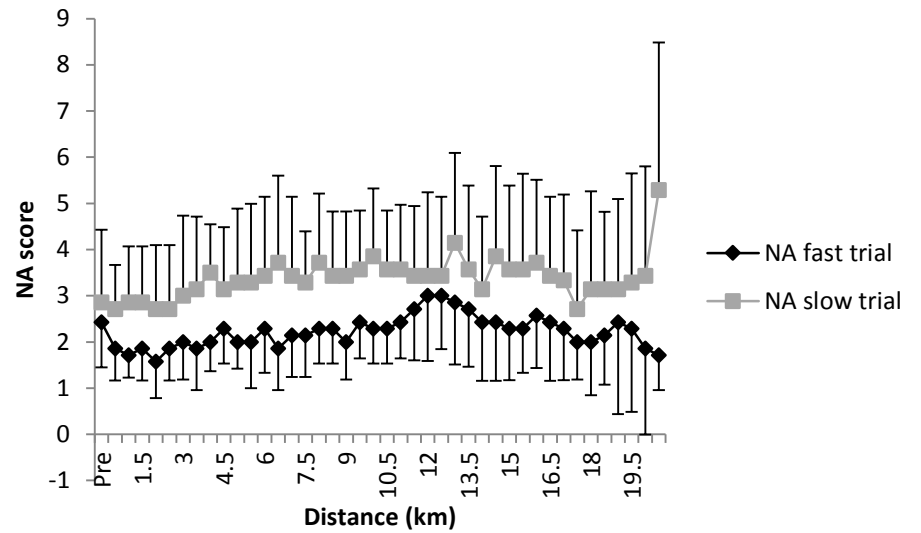


Figure 5.3.8 Differences between all participants fast and slow trials for NA.

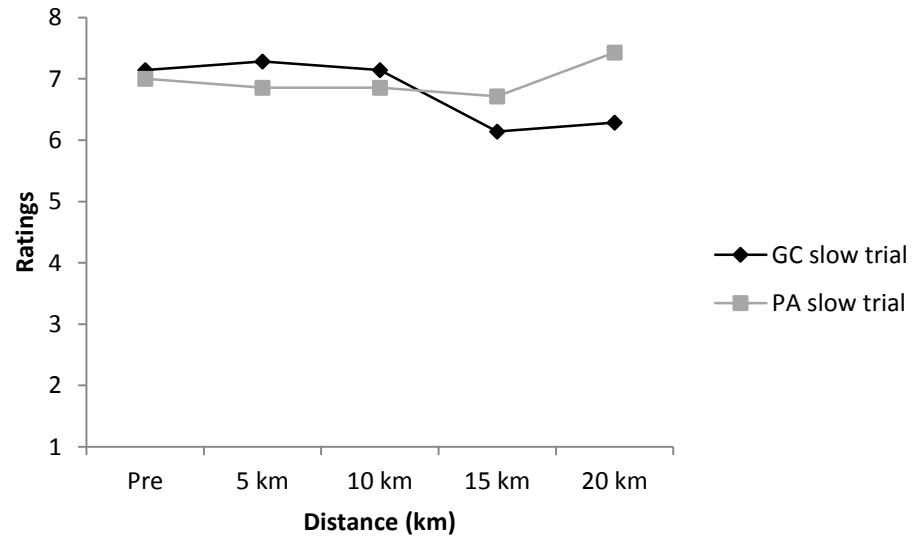


Figure 5.3.10 Relationship between GC and PA in the slow trial only.  $r = -.132$ ,  $p = .833$ .

## **5.4 Discussion**

In this study it was hypothesised that situational motivation would increase after riding the fastest trial. However, SIMS responses were different for each participant with 3 participants, out of the 5 sets of data for post-fast trial, demonstrating a slight increase in IM after riding their fastest trial, one participant remained the same for all SIMS motivational subscales pre- to post-fast trial and 1 participant decreased for IM and ID pre- to post-fast trial. The pressure of competition has been found to undermine intrinsic motivation particularly where individuals compete against others and are unsuccessful (Reeve and Deci 1996; Gillet et al. 2009). It may have been expected that after the slower trials, intrinsic motivation would have decreased, particularly where participants' slowest trial was their second trial, thus they would have known this was an unsuccessful trial. However, this was not the case as only 1 participant decreased pre- to post- slow trial and this was also their first trial. Participant 4 reported a decrease in IM pre- to post- fast trial, yet their fast trial was 110 seconds faster and was their second trial, so they would have known they had achieved their goal. Each individual showed different patterns of situational motivation pre- to post-trials from slow to fast trials and different to each other. Furthermore, the levels of situational motivation were also different whereby nearly all instances of reported SIMS showed IM to be slightly lower than ID and ER was lower as was AM. These findings for IM post-slow trial may be a direct result of the nature of time trial competition where participants achieve their own times rather than compete against others.

An alternative explanation for most participants' lack of change in intrinsic motivation in this study could be due to the relatively short timescale between completing the performance and reporting intrinsic motivation. Time trial participants in this study were provided with current and consecutive feedback relating to their time trial performances using a range of measures. Therefore, participants were aware of their previous performance data and their current time trial status in relation to their own performances. Although participants reported goal achievement, satisfaction from immediate performance successes may not happen straight away and may take time to impact on situational intrinsic motivation (Chang et al. 2010). Intrinsic motivation is linked with long-term effects of satisfaction and well-being (Recours et al. 2004; Lonsdale et al. 2009) thus it may be only after the individual has sufficiently recovered from the physical exertion that they can evaluate the implications of their achievements and begin to internalise these. In this study, the post-test measures were completed after participants had carried out their time trial cool down strategies lasting between 10-20 minutes thus sufficient

time may not have elapsed for intrinsic motivation to be assimilated into the individual's responses at the time of measurement.

All participants stated a pre-trial 2 goal to beat their previous time, relying on an extrinsic focus. The 2 participants who produced their fastest time in trial 1 may well have perceived their slower trial 2 as a failure, as both reported that they could have ridden faster in trial 1 (slow trials) but not for trial 2. However, all participants except for P5, reported no changes for extrinsic motivation for external regulation at the end of their faster trial than for their slower trial. Xiang et al. (2005) found that where extrinsic rewards were expected, the expectation had a positive effect on performance initially but over time this motivation effect would decrease. It could be assumed that achieving a goal would result in decreased extrinsic motivation as the stimulus for the external reward has been met. However, participants in this study reported only low levels of ER throughout their trials, thus achieving an extrinsic goal such as time, may only be influencing a small part of overall motivational processes. Although, motivation for the sport in general may still be maintained as Xiang et al. (2005) also found that expectations of further external rewards also predicted future performance in an activity. The reduction in external regulation after the fast trial could be an indication of goal achievement as all reported goals were time orientated. Additionally, extrinsic motivation for external regulation for all participants was relatively low in comparison with intrinsic motivation and extrinsic motivation for identified regulation, but the external regulation scores were similar to levels of reported amotivation (between 1 and 2, where 1 is the lowest score possible).

Two out of six participants went faster in trial 1, therefore, could not have known this was their fastest trial. These two participants also reported goal achievement for their faster trial thus because motivation is defined as a drive to fulfil a need (Hein and Hagger 2007), it can be assumed that once a specific extrinsic goal (need) has been achieved its extrinsically related motivational properties (drive) would decrease immediately. This could lead to increased feelings of satisfaction in achieving a goal and thus enhance positive affective responses. However, whilst literature has linked satisfaction with intrinsic motivation, there were no increases in situational intrinsic motivation in this study as previously discussed. The literature finds that personally controlled attributions are associated with enhanced positive affect (Vlachopoulos and Biddle 1997). Therefore, because the participants knew from the feedback provided throughout the trial that they had achieved their goals and four participants knew that they had ridden their fastest trial in trial 2, this helps explain the significantly higher levels of positive affect at the end of the faster trial compared to the slower trial. This is also reflected in

the participants' scores relating to their confidence to achieve their goals which were higher at the end of the faster trial.

Gaudreau et al. (2002) found that the magnitude of discrepancy between performer's goals and actual performance outcomes were important in explaining affective change. In this study, we used perceived performance success post-trial as a basis for calculating goal discrepancy for two reasons. Firstly, some participants in this study achieved their outcome goal and yet still reported dissatisfaction in goal achievement. Secondly, in study 2 of this thesis, it was found that participants reported goal achievement post-trial without recording a pre-trial goal. Therefore, it was assumed that either individuals set and changed goals dynamically in-line with perceived performance progression (Linnenbrink and Pintrich 2002; Micklewright et al. 2009) or their goal may have been so vague or so complex that they were unable or unaware to state it prior to the task (Gernigon et al. 2004). Thus participants own perceptions of post-trial achievement or failure of goals in this study was highlighted.

Goal setting literature suggests that individuals can set unrealistically high goals or unchallenging low goals (Locke and Latham 2004) and it could be argued that the perceived successful group may have operated a defensive mechanism whereby they deliberately set less challenging goals in order to protect self-esteem should they fail (Elliot and Church 2003; Wrosch et al. 2003). Or that they just performed really well and rode a very fast time trial. However, before undertaking the time trials individuals expressed more uncertainty in relation to performance over this distance (20-km) which could have resulted in conservative goals prior to the time trial. During performance the individual may have become more certain that these goals would be too easily achieved and therefore, replaced their original goal for more challenging ones, based on current performance feedback culminating in a re-calculation of goal time (Schmidt and DeShon 2007; 2009). Whilst this could be an explanation for those who perceived themselves to be successful in trial 1, all participants reported goals to beat their times for trial 2. Participants who perceived themselves as successful included one participant who rode their fastest trial in trial 1, therefore they could not know that this was their fastest trial and although they achieved their pre-trial goal, still rated their performance as not successful. However after their slowest trial (trial 2) this participant would know they had not achieved their goal to beat their previous time and this may have influenced their perceived success rating after this trial. Participant 1 rated both trials as successful, their first trial was the slowest by 83 seconds yet pre-trial goals had been achieved thus influencing their perceptions of success. In this study, four out of six perceived unsuccessful trials, participants reported they could have

ridden faster, compared with two participants who perceived their trials as successful reporting they could have ridden faster.

Confidence in achieving goals changed significantly during cycle time trial performance. The iv) hypothesis stated that goal confidence would increase after having ridden the fastest trial and findings confirmed that four out of the six participants reported an increase in goal confidence after the fast trial compared with the slow trial. Additionally, the goal confidence scores between the perceived successful and perceived unsuccessful trials were not dissimilar right from the start of the trial and it is only towards the end at 15 km measure where the perceived successful group report noticeably higher confidence in achieving their goals than the perceived unsuccessful trials and this remains the case for the remainder of the trial. Similar to Schüller and Langens (2007) research, it can be assumed that there was a 'psychological crisis', which occurred three-quarters of the way through the trial. This psychological crisis could have taken the form of a calculation concerning goal achievement and seems to have been undertaken by all participants as they neared the end of the time trial evidenced through the changing results from lower to higher goal confidence for those who perceived their trials as successful and higher to lower goal confidence for those who perceived their trials as unsuccessful. However, this change could also be due to the increasing certainty in goal achievement for those who perceived their trials as successful and increasing certainty of non-achievement for those who perceived their trials as unsuccessful thus possibly exaggerating the goal achievement ratings towards the end of the time trial.

At the situational level it was also hypothesised that affect would play a significant role similar to other self-regulatory processes (Carver and Scheier 1982; 2002; Macdonald and Palfai 2008) as high levels of positive affect have been found to enhance exertion during difficult tasks (Gendolla and Krüsken 2002). Similar to Gaudreau et al. (2002) this study also found significant differences in affect throughout the time trial between the fast and slow trials. As expected after their fast trials, participants' reported significantly higher levels of positive affect. Nevertheless this was reported from the start of the trial and was then maintained throughout the entire trial and this was an additional finding which further supports the importance of affect at the situational level of motivation and warrants further investigation. Donovan and Williams (2003), Heckhausen et al. (2010) and Pekrun et al. (2009) found that disengaging from futile goals and replacing these with new goals can also increase positive affect. This disengaging process could be linked to a recalculation of goals which helps explain the increase in goal confidence and the sustained high levels of positive affect during the fast trials. Although there

is no actual evidence for goal change during performance, anecdotal discussion with participants during their debriefing, suggests that some participants did reassess their initial goals and either recalculated or changed their goals completely. This is an area which warrants further study to fully understand situational motivation.

In the faster trials, participants' reported significantly lower levels of negative affect pre- during and post-fast trial. This finding is contrary to control theory (Carver and Scheier 1982; 2002) where it is suggested that higher levels of negative affect are required in order to stimulate action towards achieving a goal. The affective profile shown in this study could be a result of individuals setting relatively easy goals to maintain their self-esteem or that high levels of positive affect and low levels of negative affect have a combined positive impact on perceptions of performance. It is also possible that goal monitoring would confirm adequate progression towards the goal manifesting in the higher positive affect and lower negative affect for the perceived successful group as seen here (Donovan and Williams 2003). However, Carver and Scheier's (1982) control theory further suggests that as the discrepancy between current state and desired state reduces, positive affect increases and effort directed towards the task decreases (Silvia et al. 2010). In this study as the time trial progressed, those who perceived their trials as successful became more certain about their goals, further increasing their positive affect. Although in this study, there were no indications of performance effort decreasing, measured through RPE scores, power and heart rate also frequently sampled throughout the trials.

#### **5.4.1 Limitations**

Assessing the importance of an individual's goals for this study could have taken into consideration the broader goal environment and goal proximity with other goals (Donovan and Williams 2003) in order to determine the importance of performing well within this study. Participants were asked to prepare for the trials as they would for a minor competition, however, it was unclear how participation in this study and the participant's goals for each trial may have fitted into the broader context including longer term goals for training and competition. Without this additional goal environment information it is difficult to know whether participants adhered to instructions to get from A to B '*as fast as you can*' and the subsequent release of resources towards the end (Schmidt and DeShon 2009). Participants were provided with an opportunity to record multiple goals and to show how these goals fit into normal time-trial performance, however, most participants only identified a single goal and 9 of the 12 total goals reported related to performance time outcomes. Single goal environments have been found to explain

higher variance than multiple goal environments as they do not involve potentially more complex interactions between a large range of variables including goal priority, expectancy, or discrepancy for example (Kernan and Lord 1990).

One potential limitation for this study could be the lack of a familiarisation trial prior to the first experimental trial. As participants were unfamiliar with this time trial distance, they would have no specific goals for trial 1, therefore it was expected that all trial 1 goal types would be more intrinsically orientated. This was not seen however, as participants chose outcome goals based on previous performance times calculated from similar distances. Furthermore, Vance and Colella (1990) found participants set their highest goals in the final trials and Williams et al. (2000) state that beating previous performance times is common amongst the athletic population. The specific nature of the population used in this study and the experience of participants in time-trialling, meant the goals for trial 1 were calculated from previous performances at similar distances and trial 2 goals, in line with Vance and Colella (1990) and Williams et al. (2000), were to beat their own trial 1 times. This competitive focus for the cyclists suggests that including more familiarisation trials would only provide similar goal results. This study tested only a small sample size thus the findings must take into consideration the limited generalisability of these results particularly as a specific population of well-trained cyclists was used. However, Williams et al. (2000) also used a small sample size and noted generalisation difficulties but suggested that the quality of the time-sampled data collection enabled in-depth analysis and in this study would help further explain the complexity of motivational processes. One further limitation to this study was the lack of a measure for situational motivation which could have been conducted throughout the trial along with affect and goal confidence ratings. This may have increased the quality of the time-sampled data in relation to situational motivational processes.

## **5.5 Conclusions**

The hierarchical model of intrinsic and extrinsic motivation suggests that mediators of motivation are the same at all three levels of generality however, findings from this study showed little change in pre- to post-trial situational motivation using the SIMS. However, affect was significantly different between fast and slow trials right from the start and goal achievement was generally different from part way through the time trials. It may be that major factors relating specifically to situational motivation include perceived goal progress, goal confidence and affect. Both goal achievement and positive affect have been found to contribute to intrinsic



motivation (Vallerand and Losier 1999; Murayama and Elliot 2009). From these findings it is suggested that this may take time to occur and thus would influence motivation more at the contextual level once the individual has recovered and fully evaluated the implications of their performance. Therefore representation of motivational processes at the situational level must acknowledge the dynamic nature of moment-by-moment progression.

Whilst goal progress may ultimately be constrained by and contribute to the three basic psychological needs identified as current mediators of motivation (Ryan and Deci 2000a), this may not happen immediately and thus would be more likely to occur at the contextual or more global levels of motivation. Furthermore, the basic psychological needs may still be necessary at the situational level, but they may only play a small part in determining initial behavioural responses in dynamic sporting environments. Once the activity is underway immediate self-regulatory processes such as goal monitoring and affect may be more influential as the activity evolves.

## **5.6 General discussion**

The results from study 3 show that whilst affect and confidence to achieve goals changed pre-to post-trial, situational motivation did not increase for all participants as expected. It may be that aspects of situational motivation from self-determination theory act as part of a feedback process matching current and on-going performance with progress towards a specific goal. For example, intrinsic motivation which includes characteristics of accomplishment, knowledge and stimulation, may only change over a longer period of time once the individual has had sufficient time to reflect on and assess performance in relation to changes across these areas. It could also be argued that in setting a goal, participants have already accessed various motivational strategies encompassing combinations of intrinsic and extrinsic processes. However, working towards a specified time goal as for cycle time trial performance, is a relatively simple goal with which to measure goal progress. Monitoring how much time has expired, how much further to go and calculating how long that might take at current pace is only influenced by the individual and their desire or belief that they can sustain their performance appropriately. Changes in intrinsic motivation were expected in relation to goal achievement and satisfaction. Although this would create a paradox whereby dissatisfaction is needed in order to stimulate and direct energy and focus towards completing an activity or goal according to control theory (Carver and Scheier 1982; 2002) and goal setting theory (Locke and Latham 2004).

It may be that the decreased spatial interval in which situational motivation was measured between study 2 and study 3, demonstrates that feelings of satisfaction regarding goal achievement can influence intrinsic motivation over a period of 1 week for more experienced participants in an activity but a time period of 30-60 minutes is too short for participants to internalise achievement affecting situational intrinsic motivation. The immediate changes in affect for participants who had achieved their goals could be a reflection of external motives being generally more tangible and more immediately measurable as opposed to corresponding aspects of situational motivation. The individual can see whether, for such a simple goal as beating a previous time or a calculated time (as in trial 1), they have achieved or not achieved immediately as they reach the end point. It would however be expected, that the external goal has no more power to stimulate effort, drive and performance and is thus reported as lower. This was not the case in study 3, and it may be that these aspects of situational motivation were transferred into the higher levels of positive affect reported for successful riders.

According to goal setting theory, a mismatch between current performance state and future performance state generates a drive towards achieving the future performance state (Locke and

Latham 2004). However, high levels of negative affect have also been found to accompany this drive as the individual is thought to be dissatisfied with their current performance state (Carver and Scheier 1982; 2002). Study 3 found that five out of the six participants who perceived their time trial performance to have been more successful, reported lower levels of negative affect than those who perceived their time trial performance to be more unsuccessful. As finding from study 3 show the strong correlation with goal confidence and positive affect meant that this was also accompanied by significantly higher levels of positive affect. These affective ratings suggest that the perceived successful individuals were not as dissatisfied with their pre-trial performance state as the perceived unsuccessful individuals. There could be a number of reasons to explain these findings. Firstly, it is possible that the perceived successful group set a goal which they felt able to achieve with minimal stress and the goal discrepancy differences provide some speculative support for this. The perceived successful group achieved significantly more than they expected, possibly due to reporting a conservative goal. However, some of these successful trials were reported in trial 1 and trial 2 goals for all participants were set to beat their previous times. Additionally all participants reported similar levels of goal confidence at the start of the trial thus suggesting the level of goal difficulty may have been perceived as similar for both groups.

Secondly, those who perceived themselves as successful may have set additional goals which went unreported and which were possibly related to process and other more intrinsic orientations. Goal achievement data for unreported goals was found in study 2 results. However, despite collecting goal confidence data during time trial performance in study 3 and observing changes in goal confidence depending on goal progress and increasing certainty at three quarters of the distance, none of the participants reported changes in goals or goal type. Only one participant reported additional goals related to working at specific levels of intensity calculated from previous performances and training sessions. This same participant informally disclosed that during the second time trial performance, it was very clear that the goal would not be achieved and therefore, using the data provided for remaining distance and time elapsed, they recalculated their goal resulting in an overall goal achievement rating at the end of this trial.

Finally, the low negative affect and high positive affect shown by those who perceived themselves as successful at the start of their time trial may be influenced by the low level of threat perceived by the participant as there were no direct competitors. Other participants results were not displayed or discussed with participants, neither were they given any indication of normative performance data in terms of rank order. Therefore, the participants were racing

against themselves and their own previous times. The relationship between external pressure and performance has been discussed earlier for extrinsic motivation. Additionally external pressure is related to increased negative affect. Thus it may be that those who perceived themselves as unsuccessful set more challenging goals in terms of their ability to achieve times set, or that those who perceived themselves as successful set less challenging goals thus resulting in the goal discrepancy ratings seen in study 3. However, the level of challenge can only be surmised based on the results from the likert scale for goal confidence and levels of goal confidence were similar across fast trials for all six participants ranging from 7-10 suggesting that participants perceived the task as similarly challenging in their confidence to achieve their goals. This reported goal confidence range changes for the slow trial (4-10) with participant 1 reporting the lowest level of confidence for their first and slowest trial, suggesting their goal was more challenging. However P1's pre-trial goal was for a time of 40 minutes, which they achieved with a relatively large margin (32 minutes 50 seconds) suggesting that this goal or the time trial task created a large level of uncertainty, reflected in the low rating for confidence to achieve their goals.

In the next study concurrent measures of goal confidence and affect are included and additional investigation into the broader context of how the data collection was perceived alongside current training and competition status. Furthermore, study 4 utilised a measure of motivational intensity and relating this to overall performance. This measure of motivational intensity was a very short, single likert scale measure of motivation designed to record how much motivation in general is felt at the time of reporting. The concept for motivational intensity arose from the general consensus within the literature recognising that individuals use a complex combination of intrinsic and extrinsic motives to drive their effort and intensity towards an activity (Vansteenkiste et al. 2006). This coupled with an acknowledgement that the individual may not know how they are motivated and therefore, be unaware or unable to articulate this when asked (Hardy and Gustavo 2005; Robinson et al. 2005), led to a simple measure of motivational intensity using generic terminology to determine an overall quantity of motivation and being developed specifically for this thesis. Participants were then able to include any construct which influences their motivation without having to define it or categorise it first.

## **6.0 Study 4 The moment-by-moment nature of situational motivation in a mixed-pairs badminton tournament: Which comes first, how you feel or what you did?**

### **6.1 Introduction**

Motivation has an important role to play in determining and directing performance behaviour within competitive sport. At a contextual sport level, motivational orientation and perceived motivational climate provides a framework from which individuals can develop their behavioural expectations into achievable goals for competition and performance. Tenets of SDT as the situational level help facilitate development of regulatory processes enabling self-determined behaviours (Deci et al. 1994; Levesque et al. 2008; Niemiec et al. 2008).

The HMIEM provides a framework for the complex interaction between general global motives, the more specific contextual motives and those demonstrated moment-by-moment at the situational level (Vallerand and Lalande 2011). Within this model both top-down and bottom-up approaches have much support through the literature (Lavigne et al. 2009; Gillet et al. 2010; Vallerand and Lalande 2011).

The horizontal processes representing motivation in the HMIEM at each level suggest that social factors, psychological needs, motivation and behavioural or performance outcomes operate identically at each level of generality (Vallerand and Lalande 2011). Pope and Wilson (2012) found that at the contextual level, in order to enhance the accuracy and application of the hierarchical model, additions were needed. Whilst the global and the contextual level reflects the general motivational disposition of an individual (Vallerand and Bissonnette 1992), we think that a combination of situational influences and individual differences may over ride an individual's more trait-like tendencies in a given situation. Furthermore, findings from study 3 provide evidence that various self-regulatory processes, such as affect, goal discrepancy and goal confidence are more immediate and pressing at the situational level of motivation.

Self-determination theory is part of an overall implicit theory in as much as it relies on the individual to interpret and ascribe values and importance to an activity (Knee et al. 2003). This sense of ownership and control is crucial in the goal setting process as the individual is prioritising and developing strategies for directing behaviour towards a future state and thus attaining a goal (Locke and Latham 2004; 2006). Although both global and contextual

motivational orientations will influence the types of goals selected, study 3 demonstrated that during situational moment-by-moment monitoring of goal progress, feedback from both internal and external sources can directly impact upon performance and perceptions of achievement thus influencing subsequent goal striving. Conroy et al. (2011) provide support for this, finding that providing immediate feedback influenced participant's behaviour towards weekly goal progression. The type of goal has also been shown to provide a strong direction regarding performance effort, although Burnette et al. (2012) found correlations only with approach or avoidance goals and achievement but not with mastery or performance goals.

Similar to the process of goal setting theory, Carver and Scheier's (1982; 2002) control theory involves an assessment of current state matched with a desired future state. Where this assessment demonstrates a mismatch, the individual embarks on a discrepancy reduction process (Carver and Scheier 1982). Burnette et al. (2012) describes the goal setting process as self-regulatory as the individual strives towards an end point and continually monitors and adapts progress towards that desired end state utilising a range of feedback processes. Initially, possibly also at the start of an activity, these predictions or goals can be rather inaccurate, however, over time the outcome becomes more precise and inevitable (Brown and McConnell 2011). This process can happen across the duration of a single activity or over a longer period of time but after a period of uncertainty which occurs at approximately half to three quarters of the way through the goal period, goal discrepancy reduces and the individual becomes more certain about the eventual outcome (Schüler and Langens 2007). These effects were seen in study 3 where confidence to achieve goal scores for the perceived successful group of time triallists, demonstrated a cross over effect from three-quarters of the way through the trial and became significantly higher than the perceived unsuccessful group and remained significantly higher until the end of the trial.

Magnitude and direction of goal discrepancy only really account for behaviour on reflection and after performance has occurred. Initial reports of an individual's goal confidence are then matched with actual achievement outcomes to produce a goal discrepancy value as demonstrated in study 3. Gaudreau et al. (2002) found that high levels of goal discrepancy were associated with high levels of negative affect (NA) and reduced levels of positive affect (PA) early on in performance. Although, Schmidt and DeSchon (2009) found high levels of NA carried over from previous performances influenced the perceptions of current task demands and were generally detrimental to performance. Therefore, using a measure of affect may enhance reflection post performance. However, Plessner et al. (2009) and Vidic and Burton

(2010) suggest that both motivational orientation and the individual's understanding of the specific situational demands are vital components for successful performance. Thus if the individual sets appropriate goals prior to activity and measures progress and affective response during the activity this may help to provide sufficiently early feedback to influence performance within that same activity. Study 3 used these measures in this way and as previously discussed, found that confidence to achieve goals significantly increased, positive affect was significantly higher and negative affect significantly lower for the perceived successful group of time triallists.

Measuring situational factors requires high frequency sampling techniques to gain data over small temporal intervals (Campbell et al. 2010). Research has argued against using multiple situational measures as it can confound the trait perspective, and produces poor levels of consistency (Burke et al. 1984). However, other research has championed situational measurement in recognising that traits and behaviours change over time, therefore must change within the situation (Demo 1992; Smith 2006). Badminton lends itself to frequent data sampling in a competitive environment as there are natural breaks in game play in which to collect suitable data. Additionally, as badminton is a non-contact sport and players themselves do not enter into their opponents half of the court, play is very much controlled by the individual producing an effective technique at an appropriate time. Thus situational motivation within badminton can provide opportunities for players to demonstrate both an intrinsic and an extrinsic motivational focus. Furthermore, badminton is a directly competitive sport where individuals directly influence and compete against each other. This study aims to provide further evidence for understanding self-regulatory factors at the situational level of motivation during a competitive event.

In this study it is hypothesised that i) there will be differences in situational motivation relating to motivational intensity, between successful and unsuccessful players as the badminton tournament progresses; ii) successful players will report higher levels of confidence to achieve goals than unsuccessful players; iii) positive affect will be significantly higher throughout the tournament for successful players compared with unsuccessful players; iv) negative affect will be significantly lower throughout the tournament for successful players compared with unsuccessful players; and v) the pattern of goal types will be different for successful players compared to unsuccessful players during the tournament.

## **6.2 Method**

### **6.2.1 Design**

This study used a repeated measures design to record badminton performance, affect, goal progress and motivational intensity during a mixed-doubles competitive badminton tournament. Players set and tracked goals and very short situational measures were undertaken after each game and prior to the next game throughout the tournament. After each match (best out of 3 games) longer motivational and affective measurement responses were sought.

### **6.2.2 Participants**

Participants were a convenience group of 8 male (age:  $M = 26 \pm 8.7$  years) and 8 female (age:  $M = 23.6 \pm 6.5$  years) county level badminton players who were competing in an annual mixed-doubles competitive tournament held for players within their club in the West Midlands. Participants were playing in their usual pair combination and reported a mean of  $14 \pm 7$  years playing experience.

### **6.2.3 Procedure**

After University ethics approval was gained, county level mixed doubles badminton players competing in an annual competitive club tournament were recruited for this study. The tournament has become an annual event for players within the same club who are playing at county level within the West Midlands region. Each year a one day tournament is held where players are grouped into mini leagues to play a round robin series, every pair plays every other pair in the same mini league. Winners and runners up from each mini league are then matched against each other in a knockout format until there is a final and eventual winners of the tournament. As there are only a small number of players per year, including male and female players, in order to maximise playing time and opponents the tournament is played in mixed-double pairings. Additionally, the tournament is organised by the players' themselves and their preference during the tournament is to include mixed-pairs so as to avoid relying on the players individual rankings, e.g. the lower ranked players may have less motivation to attend and play the tournament, to pre-determine who will probably win. As players registered for the tournament (16 players in total) they were provided with a psychometric measurement pack which included the SMS (Pelletier et al. 1995), the WAS (Rhoden and West 2010) and a range of simple likert scales for measuring positive (PA) and negative affect (NA), motivational intensity (MI) and goal confidence (GC). These measures were completed after players had



carried out their own warm up routines just prior to their first game in match 1. Players were also asked to state their goals for the tournament prior to the first match and goal information was also sought prior to each subsequent match or game. After each game participants' were asked to report MI, PA, NA, to identify goal changes and to report goal confidence on single likert scales which involved recording a maximum of 4 numbers. After each match, decided over the best of 3 games, players were also asked to report MI, PA, NA, goal confidence, to complete the SMS and to report goals for the next match or game. All players had 3 games in the mini leagues and if performance was successful and the pairs were winners or runners up in their mini leagues there was an opportunity for a further 2 games into the final in a knockout format.

## **6.2.4 Instrumentation**

### **Sports Motivation Scale (SMS; Pelletier et al. 1995)**

The SIMS (Guay et al. 2000) is a specific situational motivation measure, however findings from previous studies in this thesis have shown that the subscales covered in this measure do not address those identified as important factors relating to situational motivation, such as intrinsic motivation to accomplish and extrinsic motivation for introjected regulation. Therefore, this study will use the SMS (Pelletier et al. 1995) to collect motivation data at specific time points during performance. The SMS is a contextual measure for motivation, however the questions can be related to a here and now response without changing the items, for example, SMS question 2 'for the pleasure it gives me to know more about the sport I practice' can be answered from a situational perspective. For this study, the stem of the SMS (Pelletier et al. 1995) 'Why do you do sport?' was exchanged for the stem of the SIMS (Guay et al. 2000) 'Why are you currently engaged in this activity?' Repeated measurements are effective in enhancing the reliability of trait measures (Steyer et al. 1999). However data from these have then been averaged to report traits, whereas in this study the changes from time period to time period will be analysed in a situational manner.

The Sports Motivation Scale (SMS; Pelletier et al. 1995) was developed within the tenets of self-determination theory to identify and assess levels of intrinsic motivation, extrinsic motivation and amotivation (Pelletier et al. 1995). The SMS is a self-report measure consisting of 28 items corresponding to 7 subscales from the stem '*why do you practice your sport?*' The 7 subscales are divided unevenly between intrinsic motivation (intrinsic motivation to know; intrinsic motivation to achieve and intrinsic motivation to experience stimulation) extrinsic

motivation (identified regulation; introjection and external regulation) and amotivation (amotivation). The responses are reported on a 7 point Likert scale (*1=does not correspond at all; 7=corresponds exactly*) and each subscale encompasses 4 items. The SMS is a validated scale with reliability and validity scores ranging from .70 to .82 (Cronbach  $\alpha$  levels) and a mean alpha coefficient equal to .75 (Martens and Webber 2002). Furthermore, there were high, positive correlations between factors within the intrinsic and extrinsic scales indicating similar but not identical constructs (Martens and Webber 2002).

### **Worcester Affect Scale (WAS; Rhoden and West 2010)**

The WAS was developed within the hierarchical framework suggested by Watson and Clark (1997) to measure the non-specific higher order level of PA and NA rather than the specific lower level affect descriptors, e.g. sad, joy. Two single item scales were devised: positive affect which asks participants to rate how positive they feel “*right now*” on a 10-point likert scale (*1= not at all positive; 10=extremely positive*). The negative affect scale requires participants to rate how negative they feel “*right now*” on a 10-point likert scale (*1= not at all negative; 10=extremely negative*). For measuring state affect *within* activity, the scale was administered with instructions regarding “*how you feel right now?*”. The WAS takes between 5-10 seconds to complete thus enabling measurement of affect at a high frequency sampling rate during activity.

### **Motivational intensity**

Motivational intensity was measured after each game throughout the duration of the competition. Participants were asked to rate their motivational intensity in response to instructions regarding ‘*how motivated you are right now*’ on a likert scale from *1 – no motivation* to *10 - highly motivated*.

### **Goals**

Prior to the tournament participants were asked ‘*Have you set yourself a goal for this tournament?*’ and were then prompted to report their goal or explain why they have not set a goal for this tournament. At the post-trial measure, participants were asked open-ended questions relating to their perceptions of whether they were ‘*successful in achieving their goal*’ and what they could have done further to enhance their performance.

### **Goal confidence**

Goal confidence was also measured after each game of the competition and participants were asked ‘*How confident are you in achieving your goals?*’ and rated their levels of confidence in achieving their goals from 1 – *not at all confident in achieving goal*; to 10 – *extremely confident in achieving goal*.

### **6.2.5 Data analysis**

This study was assessing changes in situational motivation throughout the duration of a mixed-pairs badminton tournament hence the mixed-pairs were divided into two groups based on their final performance; successful (finishing in 1<sup>st</sup>-4<sup>th</sup> place) and unsuccessful (finishing in 5<sup>th</sup>-8<sup>th</sup> place). Previous literature has analysed data for success prior to and at the end of a single activity (Gonzalez et al. 2011; Gillet et al. 2013). This study intends to further analyse the pattern of this one-time measure of situational motivational response and analyse changes in this construct throughout the duration of an entire tournament. This study tested a situational construct using non-parametric statistical analysis due to the error variance between observations varying from situation to situation potentially demonstrating non-normal distribution at each measurement point (Jamieson 2004; Potvin and Roff 1993). The use of non-parametric statistical analysis is also due to the relatively small experimental groups consisting of mixed gender pairs (successful group  $n=8$  of which male  $n=4$  and female  $n=4$ ; unsuccessful group  $n=8$  of which male  $n=4$  and female  $n=4$ ). Previous motivational research found that males demonstrate higher levels of extrinsic motivation than females and that females have higher intrinsic motivation to accomplish and identification than their male counterparts (Fortier et al. 1995; Kingston et al. 2006). These findings further influence non-normally distributed factors within the sample and provide more support for the use of nonparametric statistics. Therefore, this study will assess motivational differences using a Mann Whitney- $U$  between the successful and unsuccessful badminton tournament players and results will be accepted at the .05 level of significance.

Goal discrepancy was calculated after each game using the players’ scores for perceptions of confidence in achieving their goal prior to the game (referred to here as goal confidence) and calculating the difference in perceived achievement after each game. For directional differences where the scores are positive the players would have achieved more than expected, whereas negative scores represent players have achieved less than they expected. Goal content was assessed from players’ goal responses and categorised into 4 broad areas which were identified

from the main motivational theories used within sport and exercise research; process goals; outcome goals; avoidance goals; intrinsic goals. Process goals include playing well through the use of clear tactics, strategies and technical mastery. This category was derived from task orientation processes within goal achievement theory (Nicholls 1984) along with a specific strategy for achieving these goals as alluded to in Rhodes et al. (2006) and Gallo et al. (2009) findings from Ajzen's (1991) theory of planned behaviour. Outcome goals were specifically focused on winning and scores, which relate to both an ego orientation from goal achievement theory (Nicholls 1984) and relate to the externally regulated motivational orientation from SDT (Deci and Ryan 2000, 2008). Avoidance goal orientations are derived from need achievement theory (Atkinson 1957) whereby the individual is motivated more to avoid losing or injury rather than focusing solely on achieving. Intrinsic goals were specifically categorised through enjoyment of the activity and this relates to SDT (Deci and Ryan 2000, 2008) where intrinsic motivational orientations generally lead to satisfaction and enjoyment. Coding the goals into the 4 identified categories was undertaken by two researchers in response to the goals reported by the players. Both researchers coded the goal information separately and then met to negotiate rationales for these classifications, this is similar to a process identified by Sanders and Cuneo (2010) who suggest that researchers should not 'be satisfied with pre-set coding categories [as] data can be too diverse' (p340).

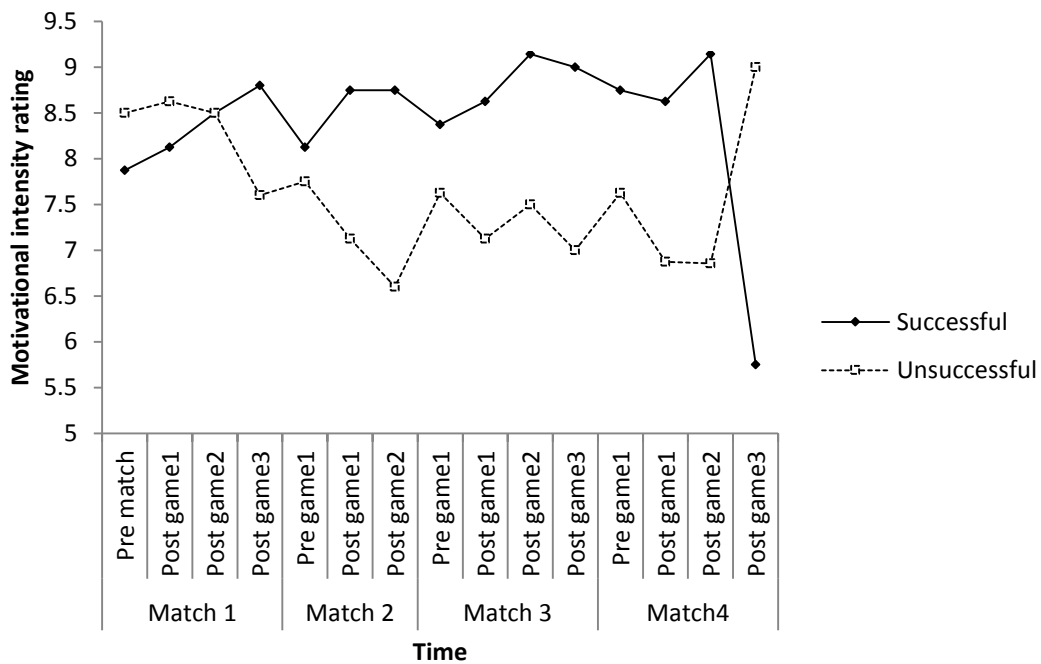
### **6.3 Results**

Intrinsic motivation was found to be significantly higher (Table 6.3.1) for the successful compared to the unsuccessful players although this occurred part-way through the tournament starting after match 2 ( $z = -2.155, p = .028, n = 16$ ) continuing to pre match 3 ( $z = -2.003, p = .05, n = 16$ ) and pre match 4 ( $z = -2.310, p = .021, n = 16$ ) and becoming highly significant post match 4 ( $z = -2.733, p = .005, n = 16$ ) at the end of the tournament. Extrinsic motivation was significantly higher for the successful group compared to the unsuccessful players also from the end of match 2 ( $z = -2.107, p = .038, n = 16$ ) and then pre-match 4 ( $z = -1.944, p = .05, n = 16$ ) and post-match 4 ( $z = -2.312, p = .021, n = 16$ ). There were no significant differences for amotivation between the successful and unsuccessful players throughout the tournament.

**Table 6.3.1** Differences between successful and unsuccessful motivation scores pre- and post- matches 1 to 4 in the tournament. \* $p < .05$ , \*\* $p < .01$ .

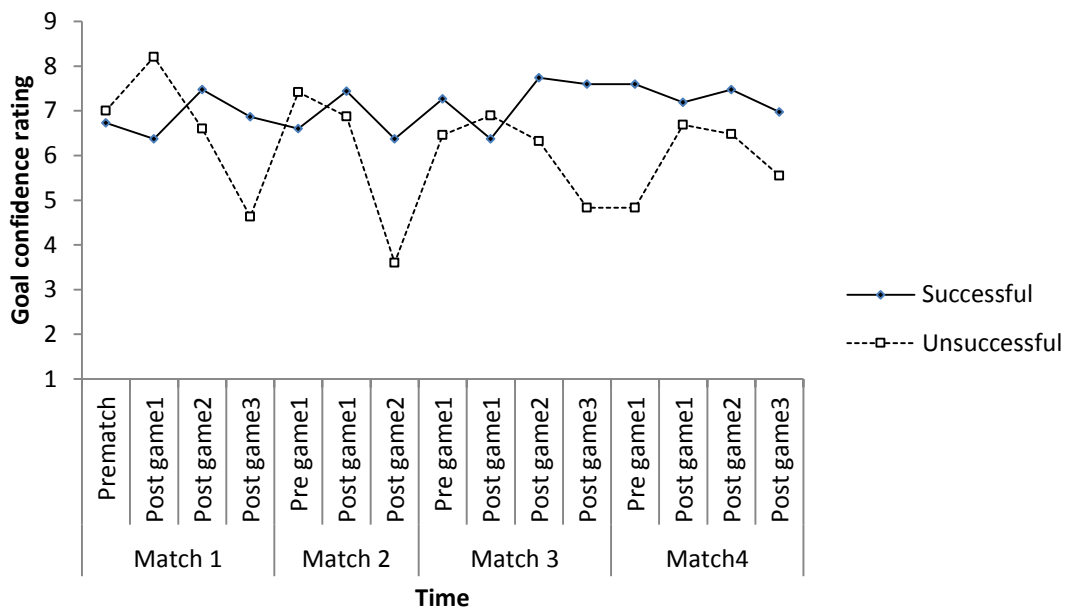
	Intrinsic motivation				Extrinsic motivation				Amotivation			
	Successful		Unsuccessful		Successful		Unsuccessful		Successful		Unsuccessful	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<b>Match 1</b>												
Pre	4.81	1.19	4.10	0.85	4.38	0.78	3.98	0.99	2.03	0.57	2.19	1.04
Post	4.95	1.11	4.14	0.85	4.86	0.76	4.10	1.07	1.91	0.98	2.31	0.79
<b>Match 2</b>												
Pre	4.93	1.35	4.08	0.98	4.68	0.98	4.03	1.03	1.91	1.09	2.13	1.11
Post	5.34*	1.37	3.81*	1.09	5.20*	1.22	3.91*	1.31	1.94	1.21	2.22	1.11
<b>Match 3</b>												
Pre	5.22*	1.28	3.84*	0.98	4.95	1.03	3.99	1.38	2.09	1.36	2.25	1.10
Post	5.33	1.28	3.45	1.04	5.11	1.08	3.73	1.39	2.18	1.05	2.16	1.07
<b>Match 4</b>												
Pre	5.20*	1.21	3.61*	1.24	4.95*	1.04	3.69*	1.39	2.53	1.43	2.31	1.19
Post	5.30**	1.20	3.38**	1.30	5.21*	1.36	3.46*	1.38	1.63	0.69	2.31	1.14

Motivational intensity was significantly higher for the successful group compared to the unsuccessful group of players (Figure 6.3.1) and similar to the SMS results significant differences in motivational intensity occurred towards the end of the tournament (Match 3, post game 2,  $p = .035$ ,  $z = -2.230$ ,  $n = 13$ ; Match 4, post game 2,  $p = .026$ ,  $z = -2.222$ ,  $n = 14$ ). There is also a cross over effect between successful and unsuccessful MI which occurs close to the start of the tournament after game 2 of the first match.



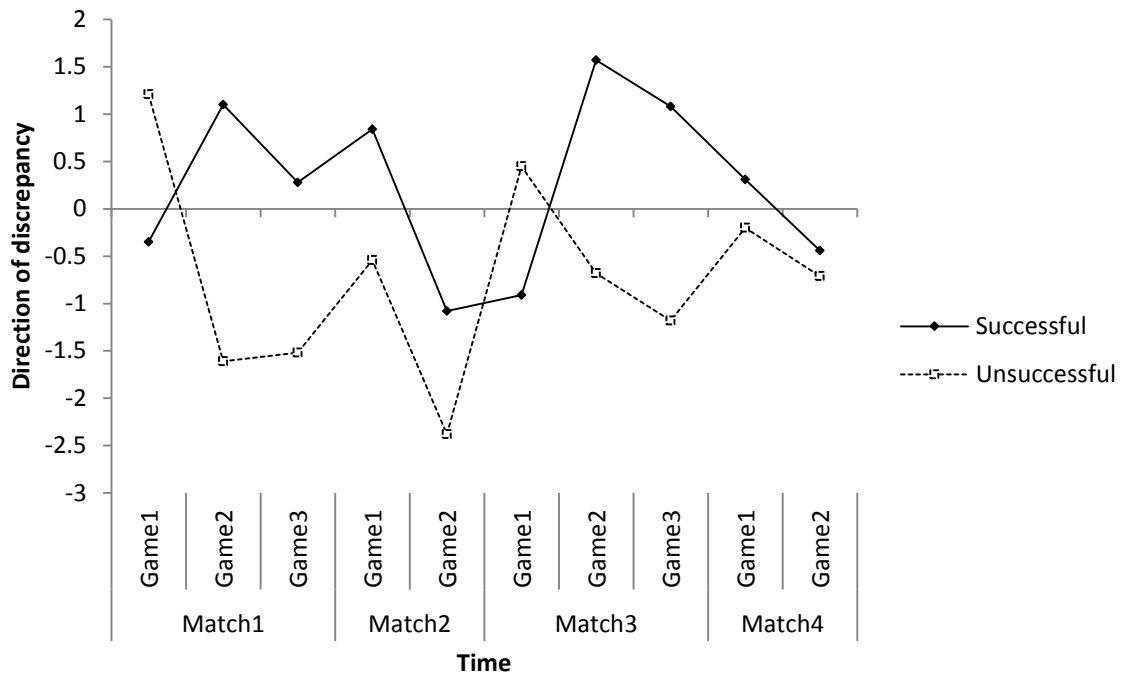
**Figure 6.3.1** Ratings of motivational intensity during the tournament for successful and unsuccessful players.  $*p < .05$ .

After game 1 the unsuccessful group reported significantly higher levels of goal confidence than the successful players (Figure 6.3.2) (unsuccessful  $M = 8.21$ ,  $SD = 1.04$ , successful  $M = 6.38$ ,  $SD = 1.85$ ,  $p = .028$ ,  $z = -2.194$ ,  $n = 16$ ). A large percentage of the successful group lost their first game of the tournament (6 out of 8 players [equivalent to 3 out of four pairs] lost game 1). The only successful pair who won game 1 also finished as overall winners in the tournament. The successful group went on to win the majority of their remaining games in the tournament.



**Figure 6.3.2** Ratings of goal confidence during the tournament for successful and unsuccessful players.  $*p < .05$

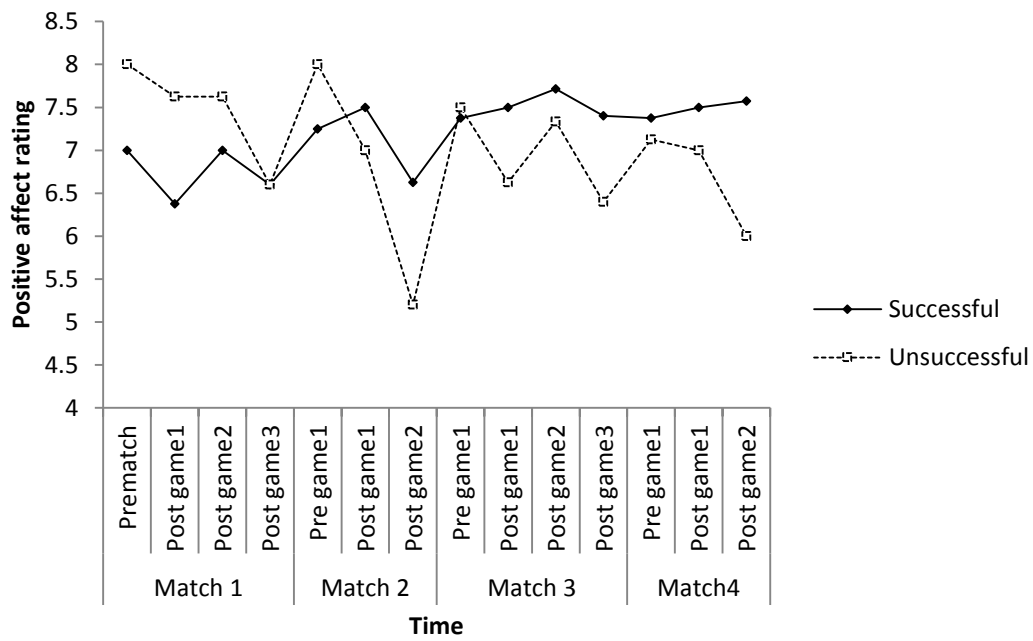
The difference in goal confidence using the post goal confidence score and subtracting the pre-goal confidence score for each game, was used to calculate goal discrepancy throughout the tournament (Figure 6.3.3). With the exception of game 1, the direction of discrepancy was significantly more positive for the successful players than the unsuccessful players throughout the tournament meaning that the successful group achieved better than they had expected. However, in game 1 the successful group demonstrated a negative discrepancy, doing worse than they expected, ( $M = -.35, SD = 1.59$ ) whilst the unsuccessful group reported a positive discrepancy, doing better than expected ( $M = 1.21, SD = .37$ ) and this was also significantly different between groups ( $p = .028, z = -2.187, n = 16$ ).



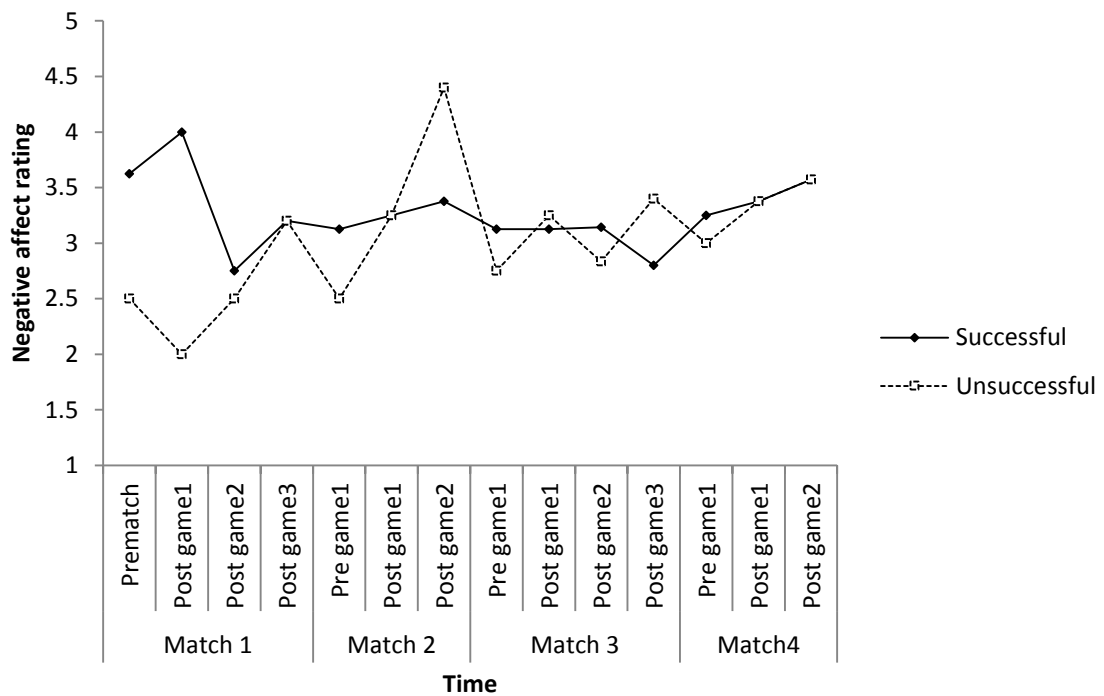
**Figure 6.3.3** Difference in direction of goal discrepancy throughout the tournament between successful and unsuccessful players.  $*p < .05$ ,  $**p < .01$ .

Positive affect was not significantly different for the successful group compared to the unsuccessful group (Figure 6.3.4). Negative affect was significantly higher (Figure 6.3.5) for the successful than for the unsuccessful players after the first game in match 1 only (successful:  $M = 4$ ,  $SD = 1.85$ , unsuccessful:  $M = 2$ ,  $SD = .115$ ,  $p = .029$ ,  $z = -2.178$ ,  $n = 15$ ).





**Figure 6.3.4** Differences in positive affect between successful and unsuccessful players.



**Figure 6.3.5** Differences in negative affect between successful and unsuccessful players.  $*p < .05$

Reported goal data showed that after match 1 the successful group became more specifically focused on winning and intrinsic goals rather than a general goal to play well (Table 6.3.2). This

remained similar until the 4<sup>th</sup> match where more successful players reported a goal for playing well and less for avoidance of injury or losing. For the unsuccessful group after match 1, players reported less focus on playing well and many more players reported an increased desire to win. Avoidance goals were high for unsuccessful players in match 1, but then diminished for the remaining matches. Intrinsic goals were absent for the unsuccessful group of players with the exception of match 2 where only a few players selected this type of goal. Additionally, the unsuccessful group set more goals to win and the successful group set more goals to avoid failure, also the successful group set more goals for intrinsic interest and enjoyment whereas except for the first game of match 1, the unsuccessful group set more mastery and skill type goals than the successful group.

Further visual observational analysis of goal type difference within each pairing suggest there were no differences in goal types selected by each pair prior to play. As change to goal type became a joint decision throughout the matches, pairs discussed and reflected on their performances before changing their focus as the tournament progressed. In only two cases were the goal types prioritised differently at the start and these were both for the pairs in the unsuccessful group, for example in one pair the female reported 2 process goals and one outcome goal whereas their male pairing reported one of each type. Finally, for another pair, the male reported a process and a win goal then added a caveat of an injury avoidance as their most minor priority whereas the female partner only reported a process and a win goal.

**Table 6.3.2** Goal type and percentages of players reporting different goal types in the successful and unsuccessful groups for each match.

		Process goal	Outcome goal	Avoidance goal	Intrinsic goal
Match 1					
	Successful	50	27	14	9
	Unsuccessful	47	37	16	0
Match 2					
	Successful	38	33	14	14
	Unsuccessful	40	55	0	5
Match 3					
	Successful	38	33	14	14
	Unsuccessful	42	53	5	0
Match 4					
	Successful	43	33	10	14
	Unsuccessful	45	50	5	0

## **6.4 Discussion**

This study hypothesised differences in motivation between successful and unsuccessful badminton players. Whilst results show that there were significant increases in intrinsic and extrinsic motivation for successful players compared to the unsuccessful group, these changes only started occurring part way through the tournament (from match 2) and were not significantly different prior to the tournament. These results provide some support for changes in situational motivation. However, because situational motivation only demonstrated significance differences part-way through performance and because affect was significantly different at the start of performance there may be a case for suggesting that performance behaviour and associated feelings are influencing the intrinsic and extrinsic situational motivation. This is dissimilar to the implications provided by the HMIEM, which suggests that changes in affect, behaviour and cognition are a consequence of motivation (Ntoumanis 2001; Faye and Sharpe 2008; Gillet et al. 2009). Pope and Wilson (2012) found there were differences in the horizontal processes at the contextual level of motivation. The results for this study provide further evidence that the horizontal processes at the situational motivation level of generalisability differ from those reported by the HMIEM.

In this study after the first game of the tournament, the unsuccessful group reported significantly higher goal confidence than the successful group. However, this did not remain the case for the entire tournament and whilst there were no other significant differences in goal confidence, the unsuccessful groups' ratings of goal confidence seemed to fluctuate more than for the successful group. Woodman et al. (2010) found that a reduction in confidence reflected an increase in performance due to an element of self-doubt signalling that an increase in effort is needed. Thus it is likely that the reduced goal confidence ratings for the successful group triggered an increase in performance effort which towards the end of the tournament was reflected in increased intrinsic and extrinsic situational motivation. Research suggests that confident performers do not perform well as performers perceive no reasons to increase effort towards a task (Woodman et al. 2010) or for multiple reasons including an over estimation of ability leading to inappropriate decisions and an under estimation of competitors or situational demands (Johnson and Fowler 2011). In this study, the significantly higher levels of goal confidence reported for the unsuccessful group may not have triggered a need to enhance performance for subsequent games resulting in a lower overall performance within the tournament.

The third hypothesis for this study predicted that affect would differ significantly between successful and unsuccessful players. Prior to the tournament there were no significant

differences in either positive or negative affect between the groups. However, after the first game, in which three-quarters of the successful group lost (equates to 6 out of 8 players or 3 out of 4 pairs), the successful group reported significantly higher levels of negative affect.

According to self-regulatory literature, negative affect indicates a mismatch between current performance status and a future status thus increasing attention and drive towards an activity thereby influencing performance (Carver and Scheier 1982; 2002; Tamir and Ford 2012). The early results for affect in this tournament fully support the self-regulatory processes. However, this response does not seem to replicate itself for the successful group throughout the remainder of the tournament as there are no further differences between positive and negative affect for the groups. Evidence from this study suggests that the stimulating response at the start of the tournament was strong enough to focus the successful groups' attention and drive throughout the whole of the competition. Burnette et al. (2012) suggest that this regulatory process may occur through the monitoring of goal progress using a range of feedback sources. It could then be easy to assume that the initial loss for the successful group lead to an increase in negative affect which influenced goal selection for the remainder of the tournament. On the other hand, it is possible that due to performing well for the first game of the tournament, the unsuccessful group could have based their subsequent goal focus on setting and maintaining unrealistic expectations of success.

The final hypothesis for this study suggested that the pattern of goal selection would be different between the successful and unsuccessful groups. Results show that there were changes in the percentage of players in each group selecting different type of goals in this study. The unsuccessful groups' goal selections seemed to focus more on winning than playing well, and occurred from match two and throughout the remainder of the tournament. Conroy et al. (2011) found that immediate feedback directly influences performance and it may be that the successful group were better at using immediate mastery information whilst the unsuccessful group measured their performance through win/loss feedback. This could help to explain why, in the light of the unsuccessful group losing the majority of their games in each match, they still based their goal focus on winning. Whether the unsuccessful players were using this goal strategy to employ a self-handicapping approach to protect their self-concept under conditions of failure (Elliot and Church 2003) is only surmised here and would require further investigation in future studies. However, this assumption aligns with Zuckerman and Tsai (2005) findings that individuals can identify reasons for failing which might seem insurmountable and can then focus fully on achievement rather than failure. Prior to the tournament, players expressed their

reasons for participating and explained the goals they set and it was noticed that some of the unsuccessful players were already ranking themselves between 5<sup>th</sup> and 8<sup>th</sup> place.

Goal setting is a complex process directing behaviour towards a future goal (Locke and Latham 2004; 2006) and the results of this study suggest a combination of theories to help explain it. Firstly individuals must be aware of their current performance state avoiding under or over estimation of abilities and situational demands (Johnson and Fowler 2011). Secondly, individuals need to identify a future performance state which holds realistic expectations of success for the short term nature of the tournament. Lane and Karageorghis (1997) found that unrealistic goals had a debilitating effect on performance. The resulting mismatch between current and future states initiates drive and persistence in line with Carver and Scheier's (1982) control theory. Finally this process will be carried out within contextual parameters for motivational orientations including the value and importance each individual places on the activity (Knee et al. 2003) and this process will have an immediate effect on motivation at the situational level of generalisability. Thus future studies could focus on identifying and employing effective performance strategies at appropriate times during performance in order to enhance the individual's goal progression potential and subsequent goal achievement.

#### **6.4.1 Limitations**

Limitations for this study included a lack of data concerning an overall stated goal for this tournament. Although we asked players to stipulate a goal for the first match, we did not ask them what their overall goal for the tournament might be, making an assumption that all players wanted to win the tournament. These players were recruited from the same county squad and therefore, were familiar with each others playing styles. This would mean that players and pairs would have a fairly good idea about where they fit into a competency ranking order. Thus, some players may have been constrained in their goal setting processes, knowing they could not win the tournament but wanting to win at least one game in each of their matches. However, perceptions of success may have involved immediate win loss feedback as those who lost their final matches (e.g. playing for a final rank order in the tournament) considered themselves to be unsuccessful even though they came second, third or fourth overall in the tournament. Finally, we did not assess the players coping strategies and how they dealt with losing games. Due to the level of experience the badminton players have achieved they may be used to performing well in competitive situations and some of the unsuccessful group may have utilised effective cognitive and emotional regulation strategies thus producing similar positive and negative affect seen in this study. Data was preliminarily analysed by win/loss for each game, however, this

merely provided support for previous studies showing that negative affect increased whilst positive affect, goal confidence and motivational intensity decreased after losing (McAuley and Duncan 1989; Standage et al. 2005; Cumming et al. 2007a). The opposite was true after winning a game. This method of analysis did not help to explain the more complex processes influencing motivation processes at the situational level of generalisability.

A further limitation for this study was the small sample group (n=16) used. For identifying and confirming cause and effect relationships a substantially larger sample size would be needed (Marsh et al. 1988). Although small sample sizes can be used in situations where exact covariance's are known, this may reduce the impact of sample size on cause and effect relationships, however, solutions to the cause and effect statistics of small sample sizes will still be flawed (MacCallum et al. 1999) thus reducing the reliability of such statistical procedures in this case.

## **6.5 Conclusions**

Motivation is required in order to provide a framework for achievement and for effective goal setting to occur. However, at the game-by-game situational level measured in this study, more self-regulatory processes such as goal progression and affect play a more immediate role in performance within a competitive environment. Motivational orientation may enable performers to more effectively evaluate performance and thus alter the direction of effort during performance but the ensuing benefits feeding back into motivation do not occur until later in performance. This aligns with the concept of control theory where perception of goal achievement or non-achievement becomes increasingly clear and individuals regulate their behaviours accordingly.

Findings from study 4 provide some support for further analysis of the causal relationship between affect and situational motivation with a view to altering the processes of situational motivation as depicted in the HMIEM (Vallerand 2000). The immediate changes in affect, goal type and goal confidence as a measure of goal progress occurred in the early part of the tournament whereas, changes in reported situational motivation occurred towards the end. This study used a novel measure of motivational intensity to record situational motivation during activity, however, the delay to reported changes for this measure were similar to the delayed changes reported for specific situational motivation subscales. Thus preliminary indications for this measure of motivational intensity seem to be positive in that it reflected a previously

validated measure of motivation. However, to propose this scale as a brief measure of situational motivation would be rather premature until further study and analysis against a parent measure have been carried out (Rhoden and West 2010).

## 7.0 Summary

Composite findings from these four studies suggest that how an individual is feeling prior to and during the early stages of performance combined with setting specific goals prior to their current activity, are necessary pre-requisites for directing effort and intensity towards performance during an activity. The concept of situational motivation can take into consideration definitions of motivation concerning direction, intensity and persistence of an individual towards an activity (Locke and Latham 2002; Moreira et al. 2002). The directional component about where an individual focuses their effort could be influenced situationally by the goals set and perceived ability to achieve that goal. The persistence aspect from a situational motivation perspective could be related to the progress towards achieving the goal, particularly as the individual gets more certain of the outcome. Finally, the intensity of performance seems to most closely align with the control theory perspective (Carver and Scheier 1982) where negative affect initiates a response towards the task.

However, there is still some uncertainty in this thesis about the roles positive affect plays and its relationship with performance. For example, whilst there were no significant differences in positive affect for study 4, in study 3 the affective profile for individuals who perceived success in terms of goal achievement demonstrated significantly less negative affect and significantly more positive affect than the perceived unsuccessful group. This may be due to the differences in perceived success versus actual success. In study 3, participants were divided into perceived successful and unsuccessful groups using their own ratings of goal achievement at the end of each trial. Whereas in study 4, participants were grouped by actual success and some participants who were unsuccessful may have perceived themselves as successful due to achieving the goals they set prior to the competition or prior to each match.

This thesis examined the processes of situational motivation across a range of sport and exercise populations and progressing to more competitive situations in order to analyse motivation at the situational level of generality according to Vallerand's (2000) hierarchical model of intrinsic and extrinsic motivation. Through informal discussions with athletes about training and competition motives, there seemed to be a large variation in performance motivation for each situation. There is also supporting evidence that this variation in performance happens during a competitive game (Reilly 1997; Borrie et al. 2002) and is not explained through the physical training literature (Reilly et al. 2009). As motivation is the drive behind effort and performance behaviour, it is considered to be highly important in consistently producing a necessary level of



performance essential for achievement and success (Hardy et al. 2009). Therefore utilising a series of four research studies the main aims for this thesis were: 1) to identify factors relating to situational motivation; 2) to assess changes in situational motivation; and 3) to investigate the processes of situational motivation during activity. The research questions for this thesis provide some structure for this section and the specific hypotheses related to each individual study and have been discussed in the light of findings from these studies.

### ***7.1 Aim 1: Factors relating to Situational motivation***

Prior to investigating situational motivation change, it was important to identify the most influential factors pertaining to situational study. Literature suggests that during situational measurement major influences for behaviour come from the individual's perceived situational demands and from personality traits (Sherman et al. 2010). Thus, study 1 explored differences in self-determined motivation between various personality types and sought to address the first research question; whether personality type influenced motivational profile. Findings from study 1 suggest that introverts had significantly less intrinsic motivation than extroverts which was contrary to expectations due to the introspective nature of introverts. Whilst some literature suggests that extrinsic motivation may undermine intrinsic motivation (Kruglanski et al. 1975; Wiersma 1992; Thompson et al. 1993), more recent findings and conclusions show support for a combination of intrinsic and extrinsic motives for the highly motivated individuals (Hollombeck and Amorose 2005; Pierro et al. 2006; Vansteenkiste et al. 2006; Ullrich-French and Cox 2009). Extroversion demonstrated significant effects such that extroverts reported the greatest quantities of motivation which included a combination of intrinsic and extrinsic motives. This finding provides additional support to the literature which suggested that high levels of motivation will comprise intrinsic and extrinsic factors (Weiss and Ferrer-Caja 2002; Vansteenkiste et al. 2006; Deci and Ryan 2008).

Neurotic athletes reported significantly higher levels of amotivation, poorer quality and a smaller quantity of motivation than athletes who scored low on the neuroticism subscale. Whilst amotivation for all groups was reported as the lowest quantity of situational motivation, the actual amounts varied for each personality type, as indicated below. Amotivation is considered to be detrimental to performance (Sarrazin et al. 2002) representing confusion about where to direct their effort (Shaw et al. 2005; Chen and Hancock 2006; Conroy et al. 2006; Lonsdale et al. 2009). The combination of personality continua to produce stable-extrovert, stable-introvert, neurotic-extrovert and neurotic-introvert categories found that neurotic-extroverts and neurotic-

introverts personality types also had less motivation than stable-extroverts or stable-introverts. Previous literature had suggested that neuroticism could enhance drive (Robinson and Tamir 2005). However, this may be only over a short period of time and may not be sustainable over the longer term due to a tendency for neurotic individuals to select maladaptive strategies (Furnham and Christoforou 2007).

The underlying premise for HMIEM is based on SDT and this theory suggests that situational motivation comprises intrinsic motivation, extrinsic motivation and amotivation (Vallerand 2000; Deci and Ryan 2008). Findings from study 1 concurs with the underlying premise for SDT indicating that motivational profiles demonstrated a common pattern where intrinsic motivation was represented as the highest score, then extrinsic motivation and finally amotivation was the lowest score. This profile was labelled as an ideal motivational profile and was discussed in the general discussion section after study 1. Whilst this pattern remains the same for each personality type, the levels of these broader subscales were seen to be different between the personality groups. For example, those reporting high levels of neuroticism also reported the highest level of amotivation compared to the stable groups, however, in relation to their levels of intrinsic and extrinsic motivation, amotivation still remained the lowest score.

The findings of study 1 show support for the broader constructs of motivation, e.g., intrinsic motivation, extrinsic motivation and amotivation. However, there were also more specific findings within the constructs which constitute the intrinsic and extrinsic motivation subscales, which were not found at the contextual level of study 1 and it is hypothesised that these could relate more to situational motivation. When measuring contextual motivation in conjunction with personality traits, it was assumed that a broad contextual level of sports motivation was being assessed. Nevertheless, there were two constructs which did not demonstrate any significant data with the different personality types. The conclusion drawn from this suggests that the intrinsic motivation to accomplish and the extrinsic motivation for introjected regulation subscales must be related to the situational level of motivation within the HMIEM and this assumption is further supported through the findings of Sherman et al. (2010).

Intrinsic motivation to accomplish suggests that individuals participate in order to challenge themselves (Gillet et al. 2009), however, the focus is on the process of that accomplishment rather than the outcome (Barkoukis et al. 2008). Thus the process of setting goals prior to each activity and directing effort towards goal progress was identified as being a situational motivation construct. The goal setting process has been discussed extensively through the sport

and exercise literature and there are agreements that individuals who set both long and short term goals enhance performance (Locke and Latham 2004; 2006). However, whilst long term goals are needed, the short term goals have a direct influence on immediate performance. In this thesis, participants' reported only short-term goals which were based only around that activity, collecting the longer-term goals thus contributing to the wider environmental information about the participants could help in assessing goal and performance priorities (Deci and Ryan 2008). As the individual progresses through their activity, there are time periods from the middle to the end of performance where individuals can more accurately assess the likelihood for achieving that goal resulting in recalculation of goals where this may seem unattainable (Schmidt and DeSchon 2009). The changes in goal confidence throughout studies 3 and 4 show the increased certainty in either achieving or not achieving goals as the activity progresses and lends support for Schmidt and DeSchon's (2009) findings.

Introjection relates to a suboptimal internalisation which suggests that this process has not been completed within a self-determined or supportive environment (Maltby and Day 2001; Deci and Ryan 2008). Introjection is a strong motivator which does not rely on external factors (Deci et al. 1994) and Koestner et al. (1996) suggest that there may be distinctive cognitive, behavioural and emotional patterns from those scoring highly for this factor. If this is the case it might be assumed that these patterns are demonstrated more clearly at the situational level of motivation as research shows that emotional responses are short-term, intensely experienced and linked with a trigger which is also more likely to occur during a situation (Linnenbrink and Pintrich 2002). Studies 3 and 4 both show support for this assumption in that affect changes right at the start of the activity. However in study 3, the increase in negative affect was associated with slower time trial performance which does not support the assumptions of control theory (Carver and Scheier 1982). As 4 out of the 6 slower time trials were also the first of two trials, participants reported goals which were seemingly more process orientated describing specific strategies relying on HR, power and breathing rate alongside time related goals. This more general goal could be aligned with Locke and Latham's (2006) 'do your best' type of goal which is not considered to be the most effective goal for performance.

Collecting the data in study 1 was at a time point removed from actual participation, where these feelings of guilt and shame, or pride and joy, along with accomplishment could occur more strongly immediately prior to or after an activity has taken place (Turnbull and Wolfson 2002; Biddle et al. 2003; Sirois 2004; Otani et al. 2007). This helps to explain the lack of changes or differences between these two constructs in study 1. These two subscales represent

an extrinsic and intrinsic motivational focus, which provides further support for individuals utilising a combination of both intrinsic and extrinsic motives to sustain high levels of motivation (Deci and Ryan 2008; Ullrich-French and Cox 2009). Changes in these constructs at the situational level were then investigated in study 2.

## **7.2 Aim 2: Changes in situational motivation**

The second study in line with the second research question sought to determine whether self-determined motivation fluctuated at the situational level of generality. As previously discussed intrinsic motivation to accomplish was equated with goal setting processes prior to activity due to its intrinsic regulatory classification (Barkoukis et al. 2008; Gillet et al. 2009). Extrinsic motivation for introjected regulation was linked to an overall affective response relating to approach and avoidance tendencies (Levesque et al. 2008). Therefore, study 2 included a measure of participants reported goals and perceived achievement of these in order to specifically assess levels of intrinsic motivation to accomplish. Study 2 also measured levels of reported positive and negative affect for individuals in order to assess extrinsic motivation for introjected regulation which encompasses feelings of pressure, guilt or shame for negative affect and feelings of excitement and pride relating to positive affect.

Study 2 grouped Pilates participants ( $n=64$ ) by their level of Pilates experience (beginners and experienced groups) and measured differences between goals, affect and situational motivation pre- and post- a 1 hour Pilates session over a period of 4 weeks for each group. Findings show that intrinsic motivation increased over the 4-week period for both groups only, and there were no significant differences between groups for intrinsic motivation at the start of the 4-weeks. The literature suggests that, at the situational level, motivational increases would occur mainly in extrinsic motivation for external regulation (Covassin and Pero 2004) as intrinsic motivation is linked with well-being and persistence (Maltby and Day 2001; Vansteenkiste et al. 2006; Deci and Ryan 2008) implying longer term processes. Furthermore, the internalisation process suggests that individuals motives will initially be extrinsic, then over time these motives are internalised, integrated with the individual's fundamental beliefs and morals and become representative of the intrinsic motivational factors (Prusak et al. 2004; Li et al. 2005; Sabiston et al. 2005; Standage et al. 2008).

In contradiction to the situational motivation literature regarding changes mainly in extrinsic motivation for external regulation at the situational motivation level of generality (Guay et al.

2000; Vansteenkiste et al. 2006), the findings from study 2 demonstrate that only intrinsic motivation increased across a 4-week period and there were no significant differences or changes over time between beginner and experienced Pilates participants' extrinsic motivation or amotivation. However, study 2 measured situational motivation in a non-competitive activity and whilst there is agreement in the literature suggesting intrinsic motivation is likely to be high in non-competitive activities (Frederick and Ryan 1993; LaChausse 2006), this has only been measured at the contextual more general level of motivation. Thus this thesis provides evidence for changes in intrinsic situational motivation within a relatively short period of 4 weeks. As intrinsic situational motivation increased for both groups, it could be that there was a move towards internalisation of motives for the Pilates participants' influencing this change.

As the weeks progressed more participants reported pre-Pilates session goals in both groups and subsequent goal achievement was reported as being over 80% of participants achieving each week including goal achievement reports from those who did not provide a pre-session goal. This may account for the increasing intrinsic motivation reported by the groups as goal achievement will engender feelings of satisfaction. However, there were no differences between the experienced and beginners' extrinsic motivation and neither did extrinsic motivation change over the 4-week block. Furthermore, in a non-competitive, self-directed activity, participants also reported extrinsic situational motives for Pilates providing further support to recent literature suggesting individuals need a combination of intrinsic and extrinsic motives for performance (Weiss and Ferrer-Caja 2002; Vansteenkiste et al. 2006; Deci and Ryan 2008). Motivational profiles again showed that the patterns of intrinsic and extrinsic motivation along with amotivation remained similar but the levels of these were found to change pre-, post- and during performance of studies 2, 3 and 4. All studies in this thesis demonstrated that self-determined situational motivation did change, although it was not an immediate change in relation to performance. The self-determination literature supports the notion of gradual change in motivational orientation through the concept of internalisation (Sansone et al. 1992; Covington and Mueller 2001; Prusak et al. 2004; Chen and Hancock 2006; Bye et al. 2007).

It would be expected that increases in extrinsic situational motivation measured in a more competitive environment would be greater and change more during performance, as competition provides outcome and competency feedback for athletes (Gillet et al. 2009). As the research studies in this thesis progressively sampled motivation more frequently and in more competitive situations, the changes in situational motivation were shown to occur later during performance. This led to speculation that perceived goal progress and affect are important factors in changing

or influencing situational motivation particularly as these constructs changed almost immediately during performance in studies 3 and 4. These findings also lend further support to various self-regulatory strategies (Shell and Husman 2008; Efklides 2011) including goal setting (Locke and Latham 2006) and the effects of goal progress (Schüler and Langens 2007).

However, the results of studies 3 and 4 only partially support changes mainly in extrinsic motivation during a competitive activity, as the changes were not in isolation and situational intrinsic motivation also changed in-line with perceptions of goal progress and success. Where goals were progressing satisfactorily and success was anticipated both intrinsic and extrinsic situational motivation increased, where goal achievement was becoming less certain both intrinsic and extrinsic situational motivation decreased. Therefore, the findings from this thesis suggest that the relationship between intrinsic and extrinsic motives at the situational level of generality are complex and further research is required in order to better understand this relationship.

As expected, study 2 findings showed that the positive affective responses pre- to post- Pilates sessions demonstrated significant increases in positive affect and significant decreases in negative affect for all participants. Thus data concurs with much of the affective literature within the sport and exercise domain (Reed and Buck 2009). This thesis hypothesised that affect influences situational motivation prior to performance within the activity. Study 2 findings showed that individuals with high levels of overall motivation reported significantly higher positive affect and significantly lower negative affect than those with low levels of overall motivation. However, measures were taken pre- and post- activity and therefore, cannot account for changes in affect during performance which may influence the individual's levels of intensity and effort. Additionally, affective and motivational relationships during a non-competitive activity are unlikely to be influenced by the competitive and more external variables, such as the impact of success and failure (Recours et al. 2004). Therefore repeating the assessment of these constructs in a more competitive environment such as the badminton tournament used in study 4, provides further evidence of these factors changing at the situational level.

### ***7.3 Aim 3: Situational motivation processes***

The third study investigated more frequent temporal spacing of situational motivation and affect assessing how it changed in relation to specific goals, goal progression and performance in an

individual competitive environment. Six well trained cyclists were asked to ride two 20 km time trials on a Kingcycle ergometer on separate occasions with instructions to go as fast as they could. Goals, affect, and goal achievement prior to, during (every 0.5 km) and after each time trial were measured. Situational motivation was measured pre- and post- time trial performance. Findings showed there were no differences in situational motivation prior to either of the time trial performances. From the start of the trial both positive and negative affect differed between fast and slow trials, positive affect being greater and negative affect lower for faster trials compared to the slow trials. Immediate changes in affect and goal progress were thus evident and therefore, lend support to the assumption that affect and perceptions of goal progress are important situational constructs which need to be considered in a situational motivation concept. Whilst achievement may lead to feelings of satisfaction, these feelings could be initially reported as an affective response thus helping to explain the increases in positive affect after the fastest trial, rather than immediate changes in intrinsic motivation. It may be that feelings of satisfaction take longer to become internalised as more general components of intrinsic motivation. Additionally participants may not be aware of the factors influencing their motivation, thus when asked to report explicit and specific categories they may have struggled to interpret and distinguish their situational motivation drives from other demanding performance determinants.

The third research question, does goal progress predict post- trial motivation, was not fully supported. In study 3, actual success, where individuals went faster in one trial compared to another showed no differences for situational motivation. Participants went between 36 to 110 seconds faster in their fastest trials compared with their slow trials. Perceptions of success did show a strong positive relationship with PA which confirms that as participants perceived they were doing well and were becoming more certain that they were progressing towards their goals, they reported more PA. However, in study 4 actual success for the tournament demonstrated changes in situational motivation which occurred part way through performance. This could suggest two possibilities, firstly that the actual success in study 4 was assumed to be winning or ranked in the first 4 largely because the situation utilised was a directly competitive one and the athletes also reported winning in their pre- match goals. Secondly, in study 3 there was no direct competition participants were competing with their own previous times extrapolated from known performances in the case of trial 1 or to beat their time as for trial 2. Self-referenced information during performance can help to enhance feelings of competence which in turn can result in higher levels of positive affect (Halliburton and Weiss 2002). The self-referenced level of competition goes some way to explaining the findings in positive affect

for perceived successful cycle time triallists in study 3. However, goal progress changed as participants became more certain about achieving or not achieving their specific goals from half way to three-quarters of the way through performance. This lends support to the findings from Schüler and Langens (2007) in terms of goal uncertainty.

The situations used for studies 2, 3 and 4 were considered to be progressive in which to measure situational motivation from a largely non-competitive activity through to direct competition using more frequent measurement intervals. Study 4 explores situational motivation during a directly competitive situation exploring the effects of the individual's perception of their success as competition progresses and the ensuing effects of this on situational motivation. Study 4 included an additional measure for assessing levels of situational motivation in terms of motivational intensity. The literature accepts that individuals are using combinations of both intrinsic and extrinsic motivations during activity (Vansteenkiste et al. 2006), thus the use of a single measure using a generic motivational intensity term is thought to allow the individual to express their levels of situational motivation more freely and is brief enough to use regularly during activity. Study 4 used 8 county level mixed double pairs competing in a tournament and measured their situational motivation pre- and post-each match for a total of 4 matches. Findings showed that self-determined situational motivation was significantly greater for the successful group (those who finished the tournament in top 4 places) but this only occurred part way through the tournament whilst, negative affect was significantly higher and goal confidence was significantly lower for the successful group right after the first game of the first match.

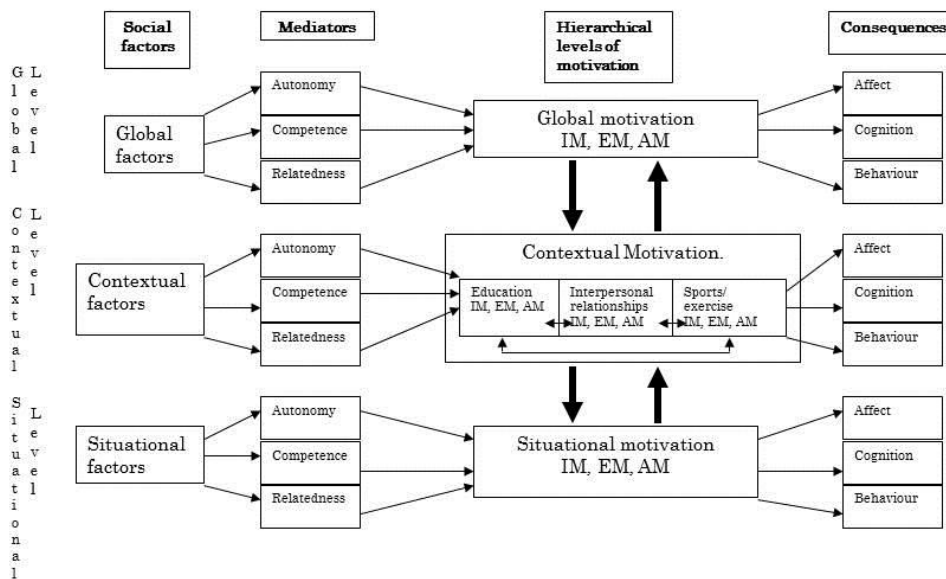
These findings do provide some support for goal discrepancy constructs (Schüler and Langens 2007) and control theory (Carver and Scheier 1982). However, the immediate changes in affect, goal confidence and goal type was interesting as opposed to the later changes in situational motivation during performance which seemed to occur after perceived success or goal achievement became more certain. There was an obvious delay in reported changes for situational motivation constructs as defined by SDT, suggesting that situational motivational responses are more reflective of performance and goal feedback rather than predicting performance effort. Although, the internalisation process could also be responsible for this delayed response, such that the individuals are interpreting their immediate response through affective channels prior to internalising the overall effects as situational motivation. This is further supported through the finding that extrinsic motivation for introjection demonstrated significant increases for the successful group compared to the unsuccessful group much earlier than the other situational motivation constructs. At the moment-by-moment level of situational



motivation, the whole process of motivation can be conceived as cyclical where the consequences of affect, behaviour and cognition become antecedents or mediators of future motivation particularly if previous feedback was positive (Turnbull and Wolfson 2002). Therefore, further investigation of affect and goal progress and their relationship with situational motivation is warranted to ascertain cause and effect.

Finally, the fourth research question, do those who demonstrate high motivational intensity finish in the top half of the competition, found some support through findings from study 4. The successful participants reported significantly higher levels of motivational intensity but only after the last game in match 3 out of the four match tournament. Again this relates to the work by Schüler and Langens (2007) who found that as participants progressed towards the end of performance, they became more certain about the possibility of goal achievement. As a result of this, the successful participants in study 4 will then know they can achieve their goals which could explain why their motivational intensity has increased and the unsuccessful participants' motivational intensity has decreased. The broad aims of this thesis as outlined previously, help to link the specific findings of the hypotheses back to the broader construct of situational motivation theory and in particular implications for the HMIEM (Vallerand 2000). The following section further discusses the aims in relation to the literature.

The HMIEM (Vallerand 2000) shows that motivation processes occur similarly at three levels of generality; namely global, contextual and situational. These processes (see figure 7.1) suggest that various situational factors coupled with a desire to satisfy the three basic psychological needs, competence, relatedness and autonomy, generate a profile of intrinsic motivation, extrinsic motivation and amotivation which then leads to changes in affect, cognition and behaviour (Vallerand 2000; Deci and Ryan 2008). Top-down and bottom-up processes within the HMIEM are well evidenced throughout the literature where contextual motivation influences situational motivation prior to an activity and that repeated experiences at the situational level influence specific contextual motives in turn (Gagné et al. 2003; Blanchard et al. 2007; Lavigne et al. 2009; Lavigne and Vallerand 2010). The findings from study 1 showed that whilst different personality types reported different levels of motivation, the general pattern of these were similar as discussed previously. Thus findings from this thesis provide some additional support for top down processes as shown in the HMIEM (Lavigne et al. 2009).



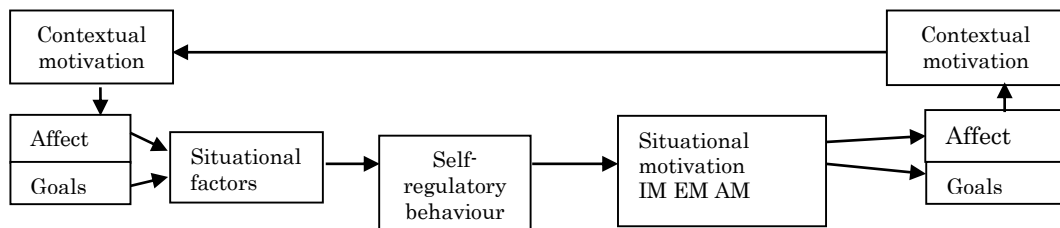
**Figure 7.3.1:** HMIEM Motivational processes at the situational level of generality (Vallerand 2000: p.266).

However, literature on the situational level of measurement suggests that research should consider both the individual's characteristics and the situational demands (Bargh et al. 1988; Abuhamdeh and Csikszentmihalyi 2009). The HMIEM may have compensated for this through the top down processes. However, whilst Pope and Wilson (2012) found evidence to support top-down processes, they also found differences in the horizontal motivational processes at the contextual level of generality from those represented in the HMIEM. Specifically, there seemed to be little transfer or interactions between different life contexts at the contextual level of motivation thus Pope and Wilson (2012) suggest setting clear and challenging goals for each context. The results of the studies in this thesis suggest that there may also be differences in the horizontal motivational processes at the situational level of generality than those represented in the HMIEM. At the situational level, the individual would be experiencing changing perception of demands as the activity progressed and as their cognitive, affective and physiological status also altered in-line with the physical activity and perceived performance outcomes. When carrying out goal assessment it is important to ascertain the level of work invested, the progress and the extent to which the individual is satisfied with this and conflict with other goals (Roberts et al. 2004).

Linnenbrink and Pintrich (2002) found that affect was a precursor to setting goals and thus influencing subsequent action. Pope and Wilson (2012) suggest that at the contextual level of generality, goals form an important part of contextual motivation. Therefore these changing affective, cognitive and behavioural responses would immediately feed into a reassessment of the initial situational demands. Affect is part of a self-regulatory process aligning with goal progress and performance outcomes (Carver and Scheier 2002; Schüler and Langens 2007). According to the concept of control theory, negative affect is indicative of a discrepancy between current status and an alternative future status which develops into a need or desire and ultimately action towards that future status (Carver and Scheier 1982; 2002). Once the individual has attained their future status, the drive decreases along with negative affect (Carver and Scheier 1982; 2002). Negative affect could be interpreted by the individual as a precursor to anxiety and therefore detrimental to performance, thus it would seem counter intuitive to have high levels of negative affect prior to performance. However, Carver and Scheier (1982) recognise that negative affect is the initial stimulus for action and it may be that once action towards the goal is inevitable or underway, then the negative affect can decrease rather than only at the time of goal achievement. This would help to further explain the data from study 3, where participants' fastest trials, therefore best performance and goal achievements, had significantly higher levels of PA and significantly lower levels of NA than their slow trials prior to the start of performance. Furthermore, working at a high intensity for 20-30 minutes does feel uncomfortable and this is evidenced through the fluctuating NA seen for most participants during both their fast and slow trials. If individuals always reported high levels of NA prior to an activity, it would seem that eventually they would begin to think negatively about the activity which could impact on their desire to participate. Carver and Scheier (2002) recognise this and they suggest that at some point there would be a change in affect to reflect more optimum performance states.

Locke and Latham's work on goal setting theory similarly suggests that the goal setting process occurs when the individual is not content with their current status and wishes to strive for an alternative status (Latham and Locke 2007; Locke and Latham 2006). In study 3 participants who achieved their short term goal of beating previous times also reported significantly higher levels of negative affect from the start of the activity. This provides some support for control theory (Carver and Scheier 1982; 2002) and highlights the importance of affect, goal setting and perceived goal progress which are important situational factors along with gradual increases in situational motivation. Taking these findings together it could be assumed that motivational

processes occurring at the situational level are not fully explained by propositions of the HMIEM at the situational level. It is therefore suggested that the process of situational motivation from the HMIEM should be represented as a cyclical process rather than linearly (Figure 7.2).



**Figure 7.3.2** A revised cyclical model of situational motivation processes adapted from the hierarchical model of motivation.

## 7.4 Limitations

This study used the SIMS (Guay et al. 2000) to assess situational motivation, however, data from study 2 showed that as time progressed throughout the 4 weeks, more participants started reporting a perfect profile. This could be a result of participants having a positive experience in Pilates sessions, evidenced through greater levels of goal achievement, and therefore, an accurate reflection of their situational motivation levels. However it could also be the case that at the situational level participants would become familiar with any frequently used measure which was similarly supported by Martín-Albo et al. (2012) longitudinal study. In some small areas of the literature current motivational SDT related measures are seen as problematic (Pope and Wilson 2012). However, the range of motivational measures, all versions of the Sports Motivation Scale, being developed and revised can attest to this (e.g. SMS-28, Pelletier et al. 1995; SMS-6, Mallet et al. 2007; SMS-II revised, Pelletier et al. 2013). Since the SIMS (Guay et al. 2000) was developed from the SMS-28 (Pelletier et al. 1995), there has been a lack of consensus relating to the subscales for this measure. Furthermore, situational constructs are expected to change thus increasing the difficulty and complexity in using standard measures of alpha co-efficient scores to clarify consistent responses at the situational level of measurement (Achenbach 1978). If these scores were within acceptable parameters this could be an indication that measures were either lacking sensitivity at the situational level, or that measurement error was encountered using the same participant over a longer period of time (Achenbach 1978). The categories on the situational motivation measure are worded such that there would be little expectation of change focusing more on the end product than the processes (for example, item 1 on the SIMS [Guay et al. 2000] *'Because I think that this activity is interesting'*). Yet at the situational level of motivation during performance, the end product is yet to be achieved thus

items should elicit responses based on the process. McDaniel et al. (2007) suggest that measures asking for typical responses are more likely to succumb to self-response distortion according to the type of individual further accentuating the measurement issue.

Study 1 used a cross sectional survey design collecting data at only one point in time, however, it is hard to infer causality from a survey design. If the study were to be repeated increasing the number of measurement time points will result in more credible trait scores longitudinally (Asendorpf 2006). More measurements of these two constructs would enable better monitoring of change and help to determine relationships between personality and motivation constructs using an ideographic or within-person approach (Conner et al. 2009). If study 2 and study 3 were to be repeated, inclusion of a personality measure which identified overarching constructs of extroversion and neuroticism would be included. The inclusion of these global traits may help to further explain participants' behaviour in goal orientated environments. Furthermore, for study 2, a measure of effort during performance would help to identify levels of reported motivation and intensity as the activity itself is largely autonomous and individuals can choose their level of effort for each activity. It may be that including a measure of effort would help identify the cause of reporting goal achievement without recording a pre-session goal.

Using a measure of motivational intensity in study 3 may have helped to explain why perceived successful performance demonstrated significant motivational differences and actual performance success did not. Additionally for study 3 using the IPIP (Goldberg 1999) to measure personality may have supported findings from study 1 concerning the motivational nature of extroversion and neuroticism. Finally study 4 could have benefited from use an objective measure of effort during performance such as HR or through a combination of timing active periods during games and HR. This may have helped to explain the sudden changes in affect and decrease in motivational intensity from those who were eventually unsuccessful.

### **7.5 Future directions**

Further study within the area of situational motivation should utilise some measurement of effort throughout performance and how this may be distributed across the duration of performance. Cumming et al. (2007) found that different imagery type interventions elicited different heart rate responses amongst athletes between motivation-general-mastery and motivation-general-arousal conditions. Therefore it may be that individuals with a higher quantity of motivation contribute more effort to performance because of the combination of high levels of intrinsic and extrinsic motivation (Vansteenkiste et al. 2009). However,

individuals with a high quality of motivation will normally demonstrate higher intrinsic motivation and lower extrinsic motivation (Vansteenkiste et al. 2009) and may select process goal types thus measuring successful performance in different ways. Whilst studies have assessed the impact goal setting may have on affective states (Laurin et al. 2008) there is little literature available to show that how an individual feels may influence their goal type, goal priority and goal pursuit. Additionally, if mood and affect occur prior to goal setting and are also influential on monitoring goal progress and resulting motivation, a manipulation of mood states prior to setting goals and then performance may demonstrate the level of influence mood has on situational motivational processes and performance.

Individuals who have participated for a long time in their sport may only set small goal increments or continuously set similar goals which may lead to routine performances. This coupled with the necessity for consistency in performance may lead to individuals perceiving goals as barriers to achieving or over achieving in competition (Burton et al. 2010). Where individuals use various bio-feedback, such as HR and power in their assessment of performance and goal progression, the individual may be more likely to calculate similar performance intensity profiles for future performances. Furthermore, this may also become a learned process, similar to arousal control and relaxation and use of bio-feedback control in these processes (Wilson et al. 2006). The more familiarity the individual has with their activity, the more difficult it may be to break through perceived performance barriers as the body has been trained and is used to performing at these intensities, therefore, the individual feels comfortable (Conroy 2008). Pushing oneself out of their comfort zone during performance may only indicate to individuals that something could be wrong and thus calculating remaining performance intensity resources may lead the individual to reduce the effort they are directing to performance.

Finally, the proposed changes to the HMIEM warrant further investigation and robust testing. The procedures mentioned previously in this section will help to provide some credibility for changes to the horizontal processes of the HMIEM. Linking situational motivation and its related constructs and processes, to immediate performance can be beneficial to individuals in a range of activities. Selecting appropriate goal and emotional management strategies earlier during performance will enhance the possibility for individuals to achieve their potential during the activity.

## 8.0 Conclusions

The process of situational motivation from findings in this thesis suggest that how an individual feels in relation to goals and perceived goal progression during performance will influence levels of situational motivation. Whilst it would be difficult to imagine a constant switch between intrinsic and extrinsic motives during performance, the quantity of each type of motivation has been found to change. An individual's contextual motivation is known to influence situational motivation in a top-down process through the HMIEM (Lavigne et al. 2009) and the type of activity undertaken by the individual is also related to specific motivational orientations such that non-competitive activities are linked to intrinsic processes and persistence (Lucidi et al. 2006) and competitive situations are related to perceptions of competency (Conroy et al. 2006).

As affective state and perceived goal progress was observed to change significantly during performance, it suggests that in order to enhance performance in an activity, the individual should set appropriate goals for training sessions and for competition which directs their effort accordingly. There is much literature regarding the purpose and process of effective goal setting (Locke and Latham 2004; 2006; Latham and Locke 2007). However, significant others (e.g. coach, team mate, parent, instructor) may influence the environment in which the individual sets their goals. As the goals will reflect the individual's contextual motivational orientations they should not be discarded or entirely altered to fit in with the overarching motivational philosophy and climate. Rationalisation of the individual's goals and how they align with the wider team processes is one way to reduce potential conflict and guide progressive goal setting for the individual (Cury et al. 2002). The role of affective state in the process of situational motivation is in need of further clarification. One body of literature suggests that if an individual feels good they will perform well (Gendolla and Krüsken 2002; Miller et al. 2005). However, control theory and its proponents suggest that an individual will act on negative affect to stimulate a response in order to meet a need or goal (Carver and Scheier 1982; 2002). It may be that feeling good in a more general or contextual manner is required and at the same time, feeling discontent about an upcoming goal such that the individual wishes to attain that level is also required to stimulate effective action.

Ultimately the individual has the final decision about which goal or goals they are prioritising for performance in various exercise, training and competitive situations. The autonomous focus of SDT reflects this aspect of choice through strong links with intrinsic motivation and persistence at an activity. However, at the situational level of motivation the individual and

significant others should consider that affect and perceived goal progression has more immediate influence on performance than motivational orientation and motivational intensity. Furthermore, changes in situational motivation transpire only after performance has occurred and thus acts as a confirmatory feedback mechanism for the individual. Therefore, external information during performance should direct the individual's attention to goal progression information.



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## **Appendices**

## **Appendix 1 Study 1 ethics forms.**



### **Ethics Checklist**

This form is intended as an initial checklist for individuals engaged in research activity at UW. If you have answered **yes** to any of the questions below, a copy of your proposal should be referred to the appropriate Department for their consideration. The tutor with whom you discuss your topic should be able to help you with this.

**Name of Student: Julia West**

**Provisional Title: Are you motivated according to your personality?**

1. Does the study involve research with human participants who may not be able to give fully informed consent? (e.g. children, vulnerable adults, employees, those with a pre-existing relationship to the researcher). Students.
2. Will the research involve the administration of any substances? (e.g. food substances, additives, alcohol etc). No
3. Will invasive procedures be part of the research? (e.g. blood sampling, temperature probes). No
4. Is there any foreseeable risk to the participant? (physical, social, psychological, emotional or financial). No
5. Does the research involve access to, or the collection of, sensitive/confidential data from other organisations? No
6. Will the study require information about unlawful activity? No
7. Will the study involve prolonged, high intensity or repetitive testing? No
8. Does the study involve deception? No
9. Does the study involve NHS patients, staff or premises? No
10. Does the study involve testing of animals? No
11. Will financial inducements be offered? No

**Signature of student: \_\_\_\_\_ Julia West \_\_\_\_\_ Date:**

\_\_\_\_\_

Tutor's name Julia West Signature:

\_\_\_\_\_

*Tutor to complete the following:*

*A copy of this proposal is being referred to the Department for further consideration:*

*NO*

*If YES – decision of Department      \* No further action required / Refer to  
UCW Ethics Committee*

*\*delete as appropriate*

## **Appendix 2 Study 2 ethics forms.**

### **Institute of Sport and Exercise Science Staff Ethics Form**

**All students are required to gain full ethical clearance before contacting participants and collecting primary data!** A copy of the proposed research project (if applicable questionnaires and interview questions) together with the informed consent form and participant information sheet should be provided to the Head of Institute (HoI) (item II of this form) to be able to make sound ethical judgement.

This form **must be typed** and **duly signed** by the HoI and the staff member(s), and both should retain a copy. A third copy should be given to the ISES Ethics Coordinator.

#### **I. Applicant details:**

Name of Staff member(s): Julia West.

Title of Proposed Project:

#### **Mind-Body Associations during short and medium term Pilates Exercise.**

Email Address: j.west@worc.ac.uk

#### **II. Research Project:**

All applicants attach to this form a summary of their research project with the following information:

1. Aim and rationale of the study
2. Hypothesis and/or Research Question
3. Methods:
  - a. participants: who, number, how recruited and selected
  - b. data: what (e.g.: interviews, fitness tests, questionnaire, video analysis,...), how collected (e.g.: lab equipment, number of interviews, selection criteria...)
4. Participant Information Sheet and Informed Consent Form.

#### **III. Ethics:**

Please answer **clearly** and **in detail** each of the following questions:

1. Who are the participants? How will consent be gained? Do they belong to a group unable to give informed consent? (If yes, please explain exactly who will give consent) Give as much detail as possible.

Participants are individuals attending Pilates sessions. Information will be collected via psychometric measures and consent information is detailed at the top of these measures as per normal practice. Furthermore, individuals will be invited to participate in advance of the data collection occurring. All participants will be over 16.

2. How will the participants be recruited? (Outline the entire recruitment procedure, e.g., Do you need permission to approach prospective participants at their school, sports club, etc.? Are there any threats to privacy through your recruitment process such as identifying prospective participants via confidential records?)

Individuals will be invited to participate at the end of their current block of sessions. Information will be given concerning the nature of the study, participant confidentiality and it will be made clear that this process will occur at the beginning of the next block of sessions. Participants will be invited to complete a number of psychometric measures before and after each session for the entire block and will be informed that they may withdraw their participation at any time. Permission has been gained from the instructor of these sessions and informed consent information is given at the beginning of the instrumentation pack as per normal questionnaire practice.

3. How will you explain the purpose and nature of your research to prospective participants?

Participants will be instructed prior to data collection on the general outline of the study. Participants will then be given further clarification on the nature of the investigation by the researchers each session. Additionally, email contact details have been provided on the forms and the researcher will be available for queries concerns or discussion about the project at these sessions.

4. Does the procedure involve **any** possible distress, discomfort or harm to participants? If **'No'**, explain why. If **'Yes'**, give details and say what steps are to be taken to protect participants. (Consider all possible causes of distress carefully, including discussion of sensitive topics, invasive procedures, maximal exercise tests, psychological stresses or deception).

No – individuals will be asked to complete previously validated and reliable psychometric measures pertaining to their experience within the Pilates sessions. Where individuals express concern regarding their responses they will be advised to cease participation and opportunities for psychological support will be offered.

5. How will you provide opportunities for potential participants to exercise their right not to participate? (Right to withdraw at any stage of the research)



Individuals will be informed that they do not have to participate. Additionally if they feel uncomfortable about not taking and completing a form, they will be advised to take one but not complete it.

6. Does the research involve contact with any other organisation or group (e.g. schools, clubs, etc.)? If **'Yes'**, give as much detail as possible.

Yes, with a Pilates group. Permission has been obtained from the instructor and the participants to use these sessions to collect participant data.

7. Will the research be undertaken outside the University of Worcester Campus? If **'Yes'**, have you made yourself aware of local provisions for Health and Safety in the research location? List them here and give as much detail as possible.

No – they are run on campus.

8. Are there any specific risks to the researcher greater than those encountered in normal day-to-day life? (Consider all possible causes of risk carefully, including social, physical and psychological.) If **'Not'**, why. If **'Yes'**, list them here and explain what you will do to minimize this risk.

No – participants will not be coerced to attend Pilates, this is something they normally choose to do. This study is using current and normal participation patterns to request data.

9. Please indicate what particular qualifications, vetting (e.g., CRB) or training are needed to administer the tests or sessions, and if so, whether the supervisor or student is appropriately qualified or external assistance is needed. Please note that students utilising laboratory equipment, Institute facilities and/or procedures are required to demonstrate competency in these procedures before collecting data outlined in the ISES lab manual.

For collection of the psychometric data using the measures listed in the proposal, no specific qualifications are required, however, the researcher has extensive experience collecting, analysing and reporting this type of data. For the Pilates sessions, the requirements for qualifications for teaching Pilates have been met by the current instructor. This study is not adapting the Pilates sessions in anyway, only data relating to the individuals experience of these sessions is being collected.

10. If the research involves research assistants or other personnel to carry out specific research tasks in your research, how will you ensure that they comply with the Institute's Ethics procedures?

Not applicable, the researcher is carrying out the research tasks.

11. How will you address anonymity and confidentiality issues? Give as much detail as possible.

The researcher has no knowledge of individuals within the sessions and asking for participant's initials is only to ensure the accurate mapping of repeated measures, longitudinal data. Data will be treated as a group and no member will be individually identified.

12. How will you provide for security of the data during and after the study? Give as much detail as possible.

All data will be stored in a secure and locked filing cabinet in the researcher's office.

12. Please describe any other procedures relevant to complying with the University Ethics or other ethical code of conduct.

No extra procedures.

***Declarations by Chief Investigator***

- The information contained herein is, to the best of my knowledge and belief, accurate.
- I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations and the rights of the participants.

Note to student: Signing this form certifies that you agree to carry out the research in the manner specified above. If you wish to deviate from the above-outlined procedures at any time, you should discuss this with your supervisor, and, if he/she thinks it necessary, you should re-submit both the UW Research/Ethics form and the ISES Research Ethics form.

**Staff's name: Julia West Signature  
2009**

**Date: 28<sup>th</sup> April**

***Declaration by Hol:***

( ) The staff member(s) can to carry out the research or appropriate assistance has been arranged.

( ) I have seen the participant informed consent and I consider it appropriate

( ) I have read the above research proposal and I consider it appropriate

A copy of this proposal is being referred to the Institute for further consideration.

( ) Yes ( ) No

Do not sign this form unless you have seen all the above-mentioned documents and all boxes have been ticked. In case the proposal is referred to the Institute please contact the ISES Ethics coordinator as soon as possible.

**Hol's name: Mick Donovan Signature:**  
**28/04/09**

**Date**

**If referred to Institute for further consideration:**

Decision of Institute (if required)

\* No further action required / Refer to UW Ethics Committee (\*delete as appropriate)

**Ethics coordinator's comments:**

## Appendix 3 Qualitative and quantitative data collection form for study 2.

### A longitudinal perspective of mood and motivation within Pilates

This research aims to develop a concept of situational motivation (motivation at a particular time) over a sustained period of time. If you wish to be a part of this research you should complete the following measures as honestly as you can before and after your Pilates sessions. If you do not wish to take part in this research then please do not complete the questionnaires. Although we ask you to put your initials on these forms, they are for our use in compiling accurate results only. When published these results will not in any way violate your confidentiality. Thank you for your cooperation. If you require further details please contact: Julia West ([j.west@worc.ac.uk](mailto:j.west@worc.ac.uk)).

#### Before Pilates.

Look at the adjectives below and circle the number which rates how you feel right now. There is no right answer and you should not spend too much time analysing your response.

#### Positive and Negative Affect Scale (PANAS)

		Not at all	A little	Moderately	Quite a bit	Extremely
1	Interested	0	1	2	3	4
2	Distressed	0	1	2	3	4
3	Excited	0	1	2	3	4
4	Upset	0	1	2	3	4
5	Strong	0	1	2	3	4
6	Guilty	0	1	2	3	4
7	Scared	0	1	2	3	4
8	Hostile	0	1	2	3	4
9	Enthusiastic	0	1	2	3	4
10	Proud	0	1	2	3	4
11	Irritable	0	1	2	3	4
12	Alert	0	1	2	3	4
13	Ashamed	0	1	2	3	4
14	Inspired	0	1	2	3	4
15	Nervous	0	1	2	3	4
16	Determined	0	1	2	3	4
17	Attentive	0	1	2	3	4
18	Jittery	0	1	2	3	4
19	Active	0	1	2	3	4
20	Afraid	0	1	2	3	4

#### Before Pilates

Circle one number on both the scales below which best represents how negative and positive you feel at this moment.

#### Worcester Affect Scale (WAS).

How negative do you feel right now?

Not at all negative **Negative state** Very negative

1     2     3     4             5             6             7             8             9             10

How positive do you feel right now?

Not at all positive Positive state Very positive  
 1      2      3      4      5      6      7      8      9      10

---

**Before Pilates.**

**Situational Motivation Scale (SIMS).**

Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently engaged in Pilates. Answer each item according to the following scale: 1 = correspond not at all; 2 = correspond a very little; 3 = correspond a little; 4 = correspond moderately; 5 = correspond enough; 6 = correspond a lot; 7 = correspond exactly.

	<i>Why are you currently engaged in Pilates?</i>		Corresponds exactly	Corresponds moderately	Corresponds	Does not correspond at all		
1	Because I think that Pilates is interesting.	7	6	5	4	3	2	1
2	Because I am doing Pilates for my own good.	7	6	5	4	3	2	1
3	Because I am supposed to do Pilates.	7	6	5	4	3	2	1
4	There may be good reasons to do Pilates, but personally I don't see any.	7	6	5	4	3	2	1
5	Because I think that Pilates is pleasant.	7	6	5	4	3	2	1
6	Because I think Pilates is good for me.	7	6	5	4	3	2	1
7	Because it is something that I have to do.	7	6	5	4	3	2	1
8	I do Pilates but I am not sure if it is worth it.	7	6	5	4	3	2	1
9	Because Pilates is fun.	7	6	5	4	3	2	1
10	By personal decision.	7	6	5	4	3	2	1
11	Because I don't have any choice.	7	6	5	4	3	2	1
12	I don't know; I don't see what Pilates brings me.	7	6	5	4	3	2	1
13	Because I feel good when doing Pilates.	7	6	5	4	3	2	1
14	Because I believe Pilates is important for me.	7	6	5	4	3	2	1
15	Because I feel that I have to do it.	7	6	5	4	3	2	1
16	I attend Pilates, but I am not sure it is a good thing to pursue it.	7	6	5	4	3	2	1

Please remember to complete the measures after your Pilates session.  
Thank you for your time.

### After Pilates.

Behaviour	Cognition
-----------	-----------

Look at the adjectives below and circle the number which rates how you feel right now. There is no right answer and you should not spend too much time analysing your response.

#### Positive and Negative Affect Scale (PANAS)

		Not at all	A little	Moderately	Quite a bit	Extremely
1	Interested	0	1	2	3	4
2	Distressed	0	1	2	3	4
3	Excited	0	1	2	3	4
4	Upset	0	1	2	3	4
5	Strong	0	1	2	3	4
6	Guilty	0	1	2	3	4
7	Scared	0	1	2	3	4
8	Hostile	0	1	2	3	4
9	Enthusiastic	0	1	2	3	4
10	Proud	0	1	2	3	4
11	Irritable	0	1	2	3	4
12	Alert	0	1	2	3	4
13	Ashamed	0	1	2	3	4
14	Inspired	0	1	2	3	4
15	Nervous	0	1	2	3	4
16	Determined	0	1	2	3	4
17	Attentive	0	1	2	3	4
18	Jittery	0	1	2	3	4
19	Active	0	1	2	3	4
20	Afraid	0	1	2	3	4

### After Pilates

Circle one number on both the scales below which best represents how negative and positive you feel at this moment.

#### Worcester Affect Scale (WAS).

How negative do you feel right now?

Not at all negative					<b>Negative state</b>					Very negative
1	2	3	4	5	6	7	8	9	10	

How positive do you feel right now?

Not at all positive					<b>Positive state</b>					Very positive
1	2	3	4	5	6	7	8	9	10	

---

**After Pilates.**

**Situational Motivation Scale (SIMS).**

Read each item carefully. Using the scale below, please circle the number that best describes the reason why you are currently engaged in Pilates. Answer each item according to the following scale: 1 = correspond not at all; 2 = correspond a very little; 3 = correspond a little; 4 = correspond moderately; 5 = correspond enough; 6 = correspond a lot; 7 = correspond exactly.

	<i>Why are you currently engaged in Pilates?</i>	Corresponds exactly	Corresponds moderately.	Does not correspond at all.
1	Because I think that Pilates is interesting.	7	6 5 4 3 2	1
2	Because I am doing Pilates for my own good.	7	6 5 4 3 2	1
3	Because I am supposed to do Pilates.	7	6 5 4 3 2	1
4	There may be good reasons to do Pilates, but personally I don't see any.	7	6 5 4 3 2	1
5	Because I think that Pilates is pleasant.	7	6 5 4 3 2	1
6	Because I think Pilates is good for me.	7	6 5 4 3 2	1
7	Because it is something that I have to do.	7	6 5 4 3 2	1
8	I do Pilates but I am not sure if it is worth it.	7	6 5 4 3 2	1
9	Because Pilates is fun.	7	6 5 4 3 2	1
10	By personal decision.	7	6 5 4 3 2	1
11	Because I don't have any choice.	7	6 5 4 3 2	1
12	I don't know; I don't see what Pilates brings me.	7	6 5 4 3 2	1
13	Because I feel good when doing Pilates.	7	6 5 4 3 2	1
14	Because I believe Pilates is important for me.	7	6 5 4 3 2	1
15	Because I feel that I have to do Pilates.	7	6 5 4 3 2	1
16	I attend Pilates, but I am not sure it is a good thing to pursue it.	7	6 5 4 3 2	1

Thank you for your time



## **Appendix 4 Study 3 ethics forms.**

### **Institute of Sport and Exercise Science Staff Ethics Form**

**All students are required to gain full ethical clearance before contacting participants and collecting primary data!** A copy of the proposed research project (if applicable questionnaires and interview questions) together with the informed consent form and participant information sheet should be provided to the Head of Institute (Hol) (item II of this form) to be able to make sound ethical judgement.

This form **must be typed** and **duly signed** by the Hol and the staff member(s), and both should retain a copy. A third copy should be given to the ISES Ethics Coordinator.

#### **I. Applicant details:**

Name of Staff member(s): A. Renfree, J. West, C. Rhoden, M. Corbett

Title of Proposed Project: Determinants of the 'endspurt' in self paced maximal endurance exercise

Email Address: a.renfree@worc.ac.uk

#### **II. Research Project:**

All the students attach to this form a summary of their research project with the following information:

5. Aim and rationale of the study
6. Hypothesis and/or Research Question
7. Methods:
  - a. participants: who, number, how recruited and selected
  - b. data: what (e.g.: interviews, fitness tests, questionnaire, video analysis,...), how collected (e.g.: lab equipment, number of interviews, selection criteria...)
8. Participant Information Sheet and Informed Consent Form.

#### **III. Ethics:**

Please answer **clearly** and **in detail** each of the following questions:

13. Who are the participants? How will consent be gained? Do they belong to a group unable to give informed consent? (If yes, please explain exactly who will give consent) Give as much detail as possible.

**Participants will be active cyclists or triathletes with time trial experience. The aim is to recruit ~10 participants in total who will all be over the age of 18. For the purposes of this study it does not matter whether they are male or female. All participants will provide written informed consent prior to undertaking any experimental procedures.**

14. How will the participants be recruited? (Outline the entire recruitment procedure, e.g., Do you need permission to approach prospective participants at their school, sports club, etc.? Are there any threats to privacy through your recruitment process such as identifying prospective participants via confidential records?)

**Participants will be recruited through personal contact with known cyclists with time trial experience.**

15. How will you explain the purpose and nature of your research to prospective participants?

**Participants will be provided with full details of the purposes of the study and the nature of any possible risks / discomfort, both in writing and verbally, prior to the giving of informed consent.**

16. Does the procedure involve **any** possible distress, discomfort or harm to participants? If **'No'**, explain why. If **'Yes'**, give details and say what steps are to be taken to protect participants. (Consider all possible causes of distress carefully, including discussion of sensitive topics, invasive procedures, maximal exercise tests, psychological stresses or deception).

**Yes.**

**Participation will require completion of three maximal exercise tests on different days (1x test of maximal voluntary contraction (MVC) using the cybex isokinetic dynamometer, and 2x maximal effort time trials). All of these tests are 'self paced' meaning that participants are able to reduce exercise intensity voluntarily at any point.**

**All participants will complete the standard UW pre-exercise health questionnaire prior to each testing session. An individual with Immediate Life Support training who is also trained to use an automated defibrillator in case of emergency will also be present at all testing sessions, and the location of the nearest qualified first aid provider on campus will be identified.**

**There are no potential causes of distress associated with the psychological measures or interview used in this study.**

17. How will you provide opportunities for potential participants to exercise their right not to participate? (Right to withdraw at any stage of the research)

**The informed consent declaration will state that all participants are free to withdraw from the study at any point without needing to state their reasons for doing so. This will be reinforced at the start of each testing session.**

18. Does the research involve contact with any other organisation or group (e.g. schools, clubs, etc.)? If **'Yes'**, give as much detail as possible.

**No.**

19. Will the research be undertaken outside the University of Worcester Campus? If **'Yes'**, have you made yourself aware of local provisions for Health and Safety in the research location? List them here and give as much detail as possible.

**No.**

20. Are there any specific risks to the researcher greater than those encountered in normal day-to-day life? (Consider all possible causes of risk carefully, including social, physical and psychological.) If **'Not'**, why. If **'Yes'**, list them here and explain what you will do to minimize this risk.

**Possible risks may be associated with handling of capillary blood samples. Standard laboratory procedures will be used to minimise these risks (all participants will complete a blood safety questionnaire, latex gloves will be worn during sampling, single use disposable lancets will be used, and all contaminated sharps, sample tubes, tissues, and gloves will be disposed of in clearly marked sharps disposal bins)**

21. Please indicate what particular qualifications, vetting (e.g., CRB) or training are needed to administer the tests or sessions, and if so, whether the supervisor or student is appropriately qualified or external assistance is needed. Please note that students utilising laboratory equipment, Institute facilities and/or procedures are required to demonstrate competency in these procedures before collecting data outlined in the ISES lab manual. Students must submit a competency form in their final submission

**None.**

**Staff have all conducted original research in the areas of either physiology or psychology that has been published in peer reviewed journals, and have experience of using all equipment / techniques required for this study.**

22. If the research involves research assistants or other personnel to carry out specific research tasks in your research, how will you ensure that they comply with the Institute's Ethics procedures?

**N/A.**

23. How will you address anonymity and confidentiality issues? Give as much detail as possible.

**Raw data from testing will only be made available to the investigators and the individual participant. Individual participants will not be referred to by name in any subsequently published papers. All data stored electronically (e.g. on software related to testing equipment) will refer to participants by number rather than name.**

24. How will you provide for security of the data during and after the study? Give as much detail as possible.

**All raw data will be stored electronically with individual participants referred to by number rather than name.**

**Names will be required for the gaining of informed consent but completed forms will be stored in a secure filing cabinet in a locked office.**

13. Please describe any other procedures relevant to complying with the University Ethics or other ethical code of conduct.

**All invasive procedures will follow standard BASES accredited laboratory protocols (re; UW human performance laboratory manual)**

**All exercise tests will use the equipment (Isokinetic dynamometer and Kingcycle rig) according to manufacturer's instructions and for the purposes intended.**

***Declarations by Chief Investigator***

- The information contained herein is, to the best of my knowledge and belief, accurate.
- I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations and the rights of the participants.

Note to student: Signing this form certifies that you agree to carry out the research in the manner specified above. If you wish to deviate from the above-outlined procedures at any time, you should discuss this with your supervisor, and, if he/she thinks it necessary, you should re-submit both the UW Research/Ethics form and the ISES Research Ethics form.

**Staff's name A Renfree  
25/03/09**

**Signature**

**Date**

***Declaration by Hol:***

( ) The staff member(s) can to carry out the research or appropriate assistance has been arranged.

( ) I have seen the participant informed consent and I consider it appropriate

( ) I have read the above research proposal and I consider it appropriate

A copy of this proposal is being referred to the Institute for further consideration.

( ) Yes ( ) No

Do not sign this form unless you have seen all the above-mentioned documents and all boxes have been ticked. In case the proposal is referred to the Institute please contact the ISES Ethics coordinator as soon as possible.

**Hol's name**

**Signature**

**Date**

**If referred to Institute for further consideration:**

Decision of Institute (if required)

\* No further action required / Refer to UW Ethics Committee (\*delete as appropriate)

**Ethics coordinator's comments:**



1	2	3	4	5	6	7	8	9	10
Not at all									Very much so

**Post Time Trial Questionnaire/interview**

Name:	
Sport:	
Age:	
Experience level:	
20km time trial - best time:	current average time:

**Time Trial Goals**

1. How successful do you think you were in achieving your goal?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much so

a) Do you think you could have gone faster?

i) What factors enabled you to achieve/ prevented you from achieving your goals?

b) How does this performance compare with your usual time trial performances? (familiarity/unfamiliarity with lab tests).

c) Why did you not achieve? Why did you achieve (locus of causality – lay the blame internally/externally)?

d) Were you in control of your time trial performance? (where was this control?)

2) Was your initial goal too challenging/ not challenging enough?

3) Do you normally set goals based on speed/ power for this event?

4) How would you normally monitor your performance in a time trial?

a) Did you miss/ need this feedback during this trial?

**Pacing strategy**

1) Did your original pacing strategy for this trial work?

2) To what extent have you achieved your original pacing strategy?

1	2	3	4	5	6	7	8	9	10
Not at all									Very much so

3) Were you happy with your pre trial preparation for this trial? (changes?)

4) Is there anything else you would have changed about your performance in this trial which you would like to mention?

**Feelings**

1) If you were to describe your overall feelings during the time trial in a maximum of 6 adjectives what would they be?

1  
2  
3  
4  
5  
6



## **Appendix 6 Study 4 ethics forms.**

### **Institute of Sport and Exercise Science Staff Ethics Form**

**All ISES staff members are required to gain full ethical clearance before contacting participants and collecting any primary data!** As part of this process, a copy of the proposed research project (if applicable questionnaires and interview questions), together with the informed consent form and participant information sheet must be electronically sent to the ISES Ethics Coordinator for ethical review by the ISES Ethics Committee. All forms submitted for ethical review **must be typed and duly signed** by Chief Investigator

#### **I. Applicant details:**

Name of Staff member(s): Clare Rhoden, Julia West

Title of Proposed Project: Affect, motivation and performance relationships in same-sex and mixed-sex athlete dyads.

Email Address: [c.rhoden@worc.ac.uk](mailto:c.rhoden@worc.ac.uk); [j.west@worc.ac.uk](mailto:j.west@worc.ac.uk)

#### **II. Research Project:**

All applicants attach to this form a summary of their research project with the following information:

##### 9. Aim and rationale of the study

An individual's affective response to differing situations and environments has received much attention within psychological research (Carpenter et al. 2010; Gray and Watson, 2007, Mellalieu, 2003; Watson, 2000). Watson's (2000) hierarchical structure of affect has empirical evidence supporting the changes in affect and their association with success and failure in sport (Walsh et al. 1992; Sanchez et al., 2010). In addition, whilst individual levels of affect and motivation have been related to performance, relationships between athletes in athlete dyads (athletes working together in a pair) has also been shown to have an important effect upon performance (Wickwire et al. 2004). Jackson et al. (2007) suggested the importance of congruence in self efficacy and other efficacy between partners within a dyad and extending this concept, Rhoden et al. (*in press*) identified the importance of affect in determining successful and unsuccessful mixed-sex dyads. Further research is warranted however to establish whether these findings are replicated across same-sex and mixed-sex

dyads. Situational motivation during performance is largely influenced by goal type (Locke and Latham, 2006) and goal progress (Donovan and Williams, 2003). The dyadic relationship between individuals has also been found to alter levels of self-determined motivation but in a subjectively orientated sport, namely figure skating (Gaudreau et al, 2010) and there has been no research conducted with a directly competitive sporting environment with a scored outcome. (may not have put this bit very well!). During performance, affect is thought to influence situational motivation and as such further research would enable antecedents such as goals, comparative performance assessment and individual and pair motivational levels of effective dyad functioning to be clarified. Badminton doubles matches provide an ideal opportunity for the comparison between same-sex and mixed-sex dyads. Thus, the aim of this study is to analyse the relationships in affect, motivation and performance between same-sex and mixed-sex athlete dyads. The current research examining badminton and determinants of performance is sparse (Rhoden et al. *in press*) and assessment of length of rallies compared to length of between point rest may allude to the distribution of effort across matches and a tournament. Watson (2000) evidenced the relationship between perceived fatigue and affective decline and positive relationships between negative affect and RPE were observed where anaerobic exercise was performed (Rudolph and McAuley, 1998). In addition....It is posited that where fatigue develops, affect profiles conducive to best performance may decline and as such this research encompasses a subsidiary and exploratory aim to establish a profile of regulation of work during badminton matches and across a tournament.

#### 10. Hypothesis and/or Research Question

As this research is exploratory no specific hypotheses have been set. The aims of the research are:

To analyse the relationships in affect, motivation and performance between same-sex and mixed-sex athlete dyads.

To examine the distribution of effort across same-sex and mixed-sex badminton doubles matches and a tournament.

#### 11. Methods:

##### Participants:

Using an opportunity sample, 32 male (n=16) and female (n=16) County or Club level badminton players aged between 17-55 years will participate in this study. All players will train and compete regularly in both mixed doubles and same-sex doubles.

##### Design:

A repeated measures cross sectional design participants will provide perceived levels of affect, motivation and goals prior to both mixed doubles and same-sex doubles matches during a team tournament which will consist of 6 matches per pair. Teams of 4 will be required.

## Measures:

### *Sports Motivation Scale*

Motivation will be assessed using the Sports Motivation Scale (SMS, Pelletier et al 1995) to identify levels of intrinsic motivation, extrinsic motivation and amotivation. The SMS is a validated scale with reliability and validity scores ranging from .63 to .80 (Cronbach  $\alpha$  levels) and a mean alpha coefficient equal to .75. Confirmatory factor analysis revealed use of the 7 subscales explained 69% of variance. Reliability coefficients for test-retest ranged from .58 to .84 (Shaw et al, 2005). Furthermore, there were high, positive correlations between factors within the intrinsic and extrinsic scales indicating similar but not identical constructs (Shaw et al, 2005).

### *Positive and Negative Affect Schedule*

Participants will be asked to complete the Positive and Negative Affect Schedule (PANAS; Watson, Clark and Tellegen, 1988) pre and post time trial in order to provide additional detailed information concerning how the participants feel. General internal consistency reliability scores for the positive affect subscale show an alpha coefficient of .88 and .87 for the negative affect subscale. Furthermore, internal intercorrelation shows an alpha coefficient of -.17 which is lower than many other short affect measures (Watson, Clark and Tellegen, 1988).

### *Worcester Affect Scale*

Positive and Negative affect will also be assessed using the Worcester Affect Scale (WAS; Rhoden and West, 2010). The scale assesses the participants' positive and negative affect on a 10 point likert scale ranging from 1 (Low levels) to 10 (very high levels).

### *Pre and post Match questionnaire*

Using likert rating scales from 1 (not at all / very low) to 10 (extremely / very high), participants will rate their goal expectations, goal achievement, comparison of perceived individual ability and comparison of perceived ability of their pair to other individuals and pairs within the tournament both pre and post match.

### *Assessment of distribution of effort*

The time (seconds) for each rally and each rest period will be recorded via a stopwatch during each match within the tournament.

### *Ratings of Perceived Exertion*

Ratings of perceived exertion (Borg, 1985) will be recorded between each game within the matches and post match.

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## 12. Informed Consent Form.

Please find the informed consent form included.

### III. Ethics:

Please answer **clearly** and **in detail** each of the following questions:

25. Who are the participants (age, gender, target population, number of participants)? How will consent be gained? Do they belong to a group unable to give informed consent? Give as much detail as possible.

*Participants are all members of regional based badminton clubs or County squads who play, train and compete regularly. Males and females aged between 17 – 55 will participate in this research. All participants will be able to provide full written informed consent.*

26. How will the participants be recruited? (Outline the entire recruitment procedure, e.g., Do you need permission to approach prospective participants at their school, sports club, etc.? Are there any threats to privacy through your recruitment process such as identifying prospective participants via confidential records?) Give as much detail as possible.

*Players will be approached either by telephone, e-mail or face-to face contact and briefed on the nature of this tournament and research. Further information will be provided through the information sheet and informed consent forms.*

27. How will you explain the purpose and nature of your research to prospective participants?

*A detailed informed consent form will be provided for participants. Participants will also be briefed on the procedure for data collection immediately prior to the competition.*

28. Does the procedure involve **any** possible distress, discomfort or harm (physical, psychological or social) to participants? If **No**, explain why. If

**‘Yes’**, give details and outline what steps are to be taken to protect participants. (Consider all possible causes of distress carefully, including discussion of sensitive topics, invasive procedures, maximal exercise tests, psychological stresses or deception).

*There may be normal competition distress experienced by participants when entering a competition and within the sporting environment there is a potential for traumatic injury. However, participants are experienced athletes who may adopt suitable coping strategies to deal with competitive pressure and access to First Aid personnel and facilities will be available during the tournament. Further access to physiotherapy can be arranged as required on an individual basis. The research requires mood and motivation ratings alongside normal tournament competitive conditions.*

29. How will you provide opportunities for potential participants to exercise their right not to participate? (Right to withdraw at any stage of the research)

*Potential participants have the right not to participate in the research at the outset as well as withdraw at any stage. This will be explained to them orally as well as in the Informed Consent form.*

30. Does the research involve contact with any other organisation or group (e.g., schools, clubs, etc.)? If **‘Yes’**, give as much detail as possible.

*No.*

31. Will the research be undertaken outside University of Worcester Campus? If **‘Yes’**, have you made yourself aware of local provisions for Health and Safety in the research location? List them here and give as much detail as possible.

*No – all aspects of the research will take place on campus. The tournament will be held in the UW sports hall utilising the current health and safety procedures.*

32. Are there any specific risks to the researcher greater than those encountered in normal day-to-day life? (Consider all possible causes of risk carefully, including social, physical and psychological.) If **‘Not’**, explain why. If **‘Yes’**, list them here and explain what you will do to minimize this risk.

*No – there are no risks other than those encountered in normal day-to-day life.*

33. Please indicate what particular qualifications, vetting (e.g., CRB) or training are needed to administer the tests or sessions, and if so, whether the researcher(s) is appropriately qualified or external assistance is needed.

*Both lead researchers are experienced practitioners in relation to data collection using psychometric instrumentation, observation and interviews. No additional training is required.*

34. If the research involves research assistants or other personnel to carry out specific research tasks in your research, how will you ensure that they comply with the Institute's Ethics procedures?

*The research will use 2<sup>nd</sup> year sports students (n=2-4) to help complete the time recordings of rallies and rest periods. Students will be briefed by lead researchers as to their professional conduct with external participants and confidentiality during research. Students would be supervised throughout the data collection process.*

35. How will you address anonymity and confidentiality issues? Give as much detail as possible.

*All data collected will be coded so that individual participant information is not easily accessible. Participants will be assured that no individual will be identifiable from their data responses and data will be analysed and reported from a group perspective. Data sheets will be securely stored and master copies of excel data sheets will be coded.*

36. How will you provide for security of the data during and after the study? Give as much detail as possible.

*During the study each participant will have all their own information; the data will be collected at the end of the competition from all participants. After the study data will be used and securely stored on password protected computers..*

37. Please describe any other procedures relevant to complying with the University Ethics or other ethical code of conduct.

*None.*

### ***Declarations by Chief Investigator***

- The information contained herein is, to the best of my knowledge and belief, accurate.
- I have attempted to identify all risks related to the research that may arise in conducting this research and acknowledge my obligations and the rights of the participants.
- **Note:** Signing this form certifies that you agree to carry out the research in the exact manner specified above. If you wish to deviate from the above-outlined procedures at any time, you should discuss this with the Ethics

Coordinator, and, if necessary, you should re-submit your ISES Research Ethics form.

**Staff's name:** Clare Rhoden

**Signature**

A handwritten signature in grey ink that reads "Clare Rhoden" with a horizontal flourish at the end.

**Date:** 6<sup>th</sup> December 2012



Decision of Institute Ethics Committee:

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**Approve no amendments required**  
**Approve with minor amendments**  
**Reject; resubmit with significant amendments**  
**Refer to University Ethics Committee**

**Ethics coordinator's comments:**