THE UNIVERSITY OF HULL

GENDER AND PERSONALITY DIFFERENCES IN COPING IN SPORT

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by

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CHAPTER 1: INTRODUCTION

1.1. Introduction

Inability to cope with stress in sport has been associated with sport withdrawal (Klint & Weis, 1986; Smith, 1986), decreased performance (Lazarus, 2000), and athletes not being able to pursue careers in professional sport (Holt & Dunn, 2004). It is therefore crucial to both researchers and practitioners working with athletes to have a greater understanding of coping in sport in order to design effective interventions and to make sport a more satisfying experience (Nicholls & Polman, 2007a).

Since the 1990s there has been an increase in published studies in coping in sport. However, the understanding of factors which might influence coping in sport is still unclear and under researched. For example, gender appears to be a moderator variable influencing the stress and coping process. Nevertheless the relationship between gender and coping in sport appears to be equivocal. Some studies have reported gender differences in coping preferences (e.g., Hammermeister & Burton, 2004; Nicholls, Polman, Levy, Taylor, & Cobley, 2007) whereas other studies did not find differences between male and female athletes in coping preferences (e.g., Bebetsos & Antoniou, 2003; Kowalski, Crocker, Hoar & Niefer, 2005). Also, as suggested by the mainstream psychology literature, personality has been considered to be a moderator factor that could influence each aspect of the stress-coping process. However, little is known about this relationship between personality and coping in sport. This is true for the basic dimensions of personality (The Big Five) and the sport specific personality trait mental toughness.

An understanding about male and female coping preferences is essential from both an applied and theoretical perspective. For example, it would allow practitioners to develop gender specific programmes for males and females to cope more effectively with stress. Also, further knowledge into the relationship between personality and

coping is required, in order to design effective intervention programmes that fit individual needs.

1.2. Overall Purpose and Overview of the Research Programme

The overall aims of this research programme were two fold. First, this research programme investigated the relationship between gender and coping in sport. For this purpose two studies were conducted with different methodologies and different ways of assessing coping. The first study used a cross-sectional design and a self-report measure of coping whereas the second study used an experimental design and 'think aloud protocol' to assess coping. Secondly, this research project investigated the relationship between personality and coping in sport. For this purpose two cross-sectional studies were conducted using self-report measures to assess coping and coping effectiveness. In the first study on personality and coping the five factor structure (The Big Five) was used to investigate the relationship between personality, appraisal, coping and coping effectiveness. In the second study this research project investigated the relationship between the sport specific personality trait mental toughness as conceptualized by Clough, Earle, and Sewell (2002), and appraisal, coping and coping effectiveness with a self-reported sport specific stressor.

The research designs for each of the four studies were consistent with methodological recommendations for future research by leading coping researchers (e.g. Crocker & Graham, 1995; Crocker, Kowalski, & Graham, 1998; Lazarus, 1999; Nicholls & Polman, 2007a; Nicholls & Polman, 2008). The following section will summarize the purpose of each study included in this thesis, and explain the rationale underpinning the selection of each research design.

1.3. Study 1. Gender differences in Coping: An Examination of the Situational and Dispositional Hypothesis

As mentioned previously, equivocal findings have emerged in the literature when investigating the influence of gender on coping in sport (Nicholls & Polman, 2007a). These equivocal findings between studies might be due to a number of methodological limitations of earlier studies. In particular, most of the research to date has been a-theoretical in nature. The exploration of gender differences has not been the primary focus of studies but posteriori findings (Ptacek, Smith, & Dodge, 1994a). This has resulted in methodological problems, including lack of assessment of situational factors (stressor appraisal) in terms of stressor intensity and perceived control over the stressor, the sources of stress, and the heterogeneity of samples. In order to overcome some of these methodological limitations Study 1 was designed to compare the utility of the dispositional and situational hypothesis/role constraint theory in determining gender-ways of coping. Accordingly, Study 1 defined a common stressor (harm/loss scenario) to all the soccer athletes (homogenous group of athletes) and situational appraisal (stress intensity/control perceived) and coping preferences were assessed for each situation.

1.4. Study 2. Gender Differences in Stress and Coping during the Execution of a Complex Motor Task

Research using self-report questionnaires has dominated the sport psychology coping literature (Crocker et al., 1998). Consequently these studies have been retrospective in nature (e.g., Anshel & Sutarso, 2007; Crocker & Graham, 1995; Qiwei & Anshel, 2006) asking participants to recall stressful situations and subsequent coping preferences often with significant time lags. As suggested by influential researchers

there is a need for more descriptive exploratory work to help provide a basis for understanding the complex person-environment interactions at the centre of the coping process (e.g. Lazarus, 1999). In order to overcome limitations associated with retrospective recall Nicholls and Polman (2008) recently adopted the think aloud protocol (Ericsson & Simon, 1993) to assess stress and coping during golf performances. As suggested by the authors this protocol reduces the amount of time between the stressful event and recall. In Nicholls and Polman's study, skilled golfers verbalized their thoughts (Level 2 verbalization) whilst playing six holes of golf. This study provided support for the notion that stress and coping is a dynamic process that changes across phases of the same performance. This was the first study which adopted this methodology to investigate stress and coping. This study was not without limitations. For example, it was unclear whether this methodology influenced actual motor performance. Also, this study did not assess behavioural and physiological variables that might accompany stress and coping in achievement situations. In particular, research has found increases in heart rate when participants were presented with stressful performance situations (e.g., Vickers & Williams, 2007) and behavioural consequences were also found in a stressful condition compared with non stress, for instance, a tendency to initiate avoidance behaviours (Spielberger, 1989); increase in facial reactivity (Walbott & Scherer, 1991); take more time to perform a task (Masters, 1992). However, little is known about differences in physiological and behavioural consequences of stress appraisal in males and females in sport. As such, Study 2 included three experiments with two distinct aims. In experiment 1 the aim was to explore the effects of concurrent Level 2 verbalization on the execution of a complex novel motor task (to investigate if this would be a viable method to use). Experiments 2 and 3 compared the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping using an experimental design. In

particular, these studies examined the effect of gender on stress appraisal, physiological functioning, behaviour, and coping during the completion of a complex motor task.

1.5. Study 3. Personality, Appraisal, Coping, and Coping Effectiveness in Sport

Despite different starting points some consensus has emerged on the basic traits present in individuals. A five factor structure (The Big Five) has been shown to capture much of the variance in personality trait ratings. The Big Five provides a common framework in which the different and diverse systems of personality can be investigated. The mainstream psychology literature has showed that the Big Five may affect coping selection in a direct way, by restricting or assisting the use of specific coping strategies or in an indirect way by influencing the nature and appraisal of the stressors experienced or coping effectiveness (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005). In particular Newth and Delongis (2004) showed that coping effectiveness in dealing with rheumatoid arthritis was moderated by personality using the Big Five. Surprisingly, little is known about the influence of the Big Five in coping in sport. Thus, Study 3 explored the relationship between The Big Five, stressor type, appraisal, coping and coping effectiveness in the sport domain.

1.6. Study 4. Mental Toughness, Stress, Stress Appraisal, Coping and Coping Effectiveness in Sport

There has been increasing attention as to the role of mental toughness in sport. An important reason for this interest has been the assumption that success in sport is associated with athletes being more mentally tough (e.g., Jones, Hanton, & Connaughton, 2002, 2007). Most research concerning mental toughness in sport has

been exploratory in nature, whereby researchers have explored athletes' understanding of this construct (e.g., Jones et al., 2007). However, such research has failed to utilize existing psychological theory (Gucciardi, Gordon, & Dimmock, 2009). An exception has been the work of Clough et al. (2002) who conceptualized mental toughness from both the athlete perspective and established psychological theory. Mental toughness in their view is a trait like construct that shares similarities with hardiness (Kobassa, 1979).

Although there appears to be an obvious relationship between mental toughness and coping in sport, surprisingly little is known about this area (Nicholls & Polman, 2007a). In one of the few studies investigating the relationship between mental toughness and coping among athletes, Nicholls, Polman, Levy, and Backhouse (2008) found that higher levels of mental toughness were associated with strategies that would be classified as problem-focused coping strategies and less use of avoidance coping strategies. The study by Nicholls et al. (2008) however, did not consider the type of stressor or how stressors were appraised by the athletes. Nor did their study investigate whether mentally tough athletes coped more effectively. Thus, Study 4 investigated the relationship between mental toughness, stress, stress appraisal, coping strategies, and coping effectiveness in the context of sport.

1.7. Definition of Key Terms

STRESS. “Refers to that quality of experience, produced through a person environment transaction, that, through either over arousal or under arousal, results in psychological or physiological distress” (Aldwin, 2007, p. 24).

STRESSORS. A condition in the environment that tends to evoke stress (Eysenck, 1998).

COPING. “A constantly changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person” (Lazarus & Folkman, 1984, p. 141).

GENDER. Comprises a number of differences between males and females extending from the biological to the environmental factors (Lippa, 2005).

PERSONALITY TRAITS. Internal factors, partly determined by experience and partially determined by heredity and physiology, that cause individuals’ characteristic patterns of thought, feeling, and behaviour (Funder, 1997).

CHAPTER 2: LITERATURE REVIEW

2.1. Coping

When circumstances place people in situations that tax or exceed their resources and endanger their well-being they are said to feel stressed (Lazarus & Folkman, 1984). As recognized by one of the foremost researchers in the area of stress, Richard Lazarus (1922 – 2002), while stress is an inevitable aspect of life it is coping that makes the difference in adaptational outcomes. In order to explain how people cope with stress Lazarus and Folkman (1984) proposed the Transactional Model of Stress and Coping (see Figure 1). In this model stress and coping is seen as a dynamic and recursive process involving interactions between the environment, appraisal and efforts to cope with the stress caused by these events (Porter & Stone, 1996). The transactional model emphasises that coping preferences are dependent on the interaction between the environmental demands and perceived capability to respond to these specific demands. This process of judgment and response to the situation is called cognitive appraisal which has been described as "the ways in which people interpret their environment and the stimuli that impinge upon them" (Steptoe & Vogele, 1986, p. 243). According to the same authors, the appraisal process influences the quality and intensity of the emotional reaction in a specific situation. To Lazarus and Folkman (1984) cognitive appraisal is an evaluative process that defines why and to what extent a particular transaction or series of transactions between the individual and the environment causes stress. Cognitive appraisal of a stressor involves both primary and secondary appraisals (Lazarus & Folkman, 1984).

Primary appraisal is the process of assessing the impact of the event in relation to the individual's physical and psychological well being. According to Lazarus and Folkman (1984) three kinds of primary appraisal can be distinguished: irrelevant, benign-positive, and stressful. In the first case the individual can appraise the situation as being irrelevant, and consequently this will not have implications for the person's

well-being. With regard to the second situation, the individual can perceive the outcome of an encounter as preserving or enhancing well-being or promising to do so. These appraisals are connected with pleasurable emotions such as love, joy, happiness, exhilaration, or peacefulness. Therefore, they do not require the use of coping strategies. However, in the third situation a coping strategy is needed as the appraisal is characterized as stressful. The stress appraisals include harm/loss, threat, challenge, and benefit. Harm/loss appraisals are characterized by the individual evaluating and interpreting previous experiences as damaging. Threat appraisals refer to harm or loss that has not happened yet, but may happen in the near future. According to Lazarus (1991), threats are events that make one feel anxious, and are connected with a strong effort to protect oneself from possible danger. The third kind of stress appraisal, challenge, is associated with a beneficial outcome. It reflects a potential gain or growth inherent in an encounter. This appraisal is characterized by pleasurable emotions such as excitement, exhilaration, desire of succeeding. Finally, the fourth kind of stress appraisal that was added to the revised model (Lazarus, 1999) is benefit. Benefit occurs when the person perceives that they are going to benefit from a situation. It reflects a potential gain or growth inherent in an encounter. Benefit underlies positive toned emotions which consist of immediate and long term emotions.

If the individual perceives the encounter as causing harm/loss, a threat, challenge, or benefit, the individual will engage in secondary appraisal (Lazarus, 1999). Secondary appraisal refers to a complex evaluative process which processes the available coping options in relation to the specific situation, focusing on minimising harm and maximizing gains or favourable outcomes (Lazarus & Folkman, 1984). The process of analysing coping options and available resources may include social, physical, psychological and material assets. The secondary appraisal process addresses judgements of the resources available to the individual, such as coping strategies and

the degree of control he or she perceives to have in meeting the demands of the situation (Zakowski, Hall, Klein, & Baum, 2001). Perceived control in this way influences the level of perceived stress and coping strategies (Compas, Banez, Malcarne, & Worsham, 1991). Despite the several dimensions identified in the definition of perceived control (Kowalski, Crocker, Hoar, & Niefer, 2005), control beliefs over the event appear to be an effective measure to assess the primary regulators of actions. The next stage in the transactional model is the actual implementation of coping responses.

Coping has been defined as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141). The coping process is initiated when the individual's primary appraisal of important goals is perceived has a threat, harm/lost. These appraisals are characterized by negative emotions that are often intense. Therefore, coping responses start in an emotional environment, and normally the first coping task is to down-regulate negative emotions that are stressful in themselves and can possibly interfere with more active ways of coping (Folkman & Moskowitz, 2004). However, as noted by Compas (1987) coping merely reflects a strategy and does not ensure the reduction of unpleasant emotions. In this way, it is important to underline the fact that the act of coping does not assure a beneficial outcome or a reduction of distress.

According to Lazarus and Folkman (1984) coping responses can be classified into two higher order categories or dimensions: problem-focused and emotion-focused. Problem-focused coping has also been labelled task orientation coping (Endler & Parker, 1990). Problem-focused or task orientation coping involves efforts to alter the situation, a person obtains information about what to do and then mobilises actions for the purpose of changing the person-environment relationship (Lazarus, 1999). Examples of the problem-focused coping strategies are: problem solving, planning, increasing

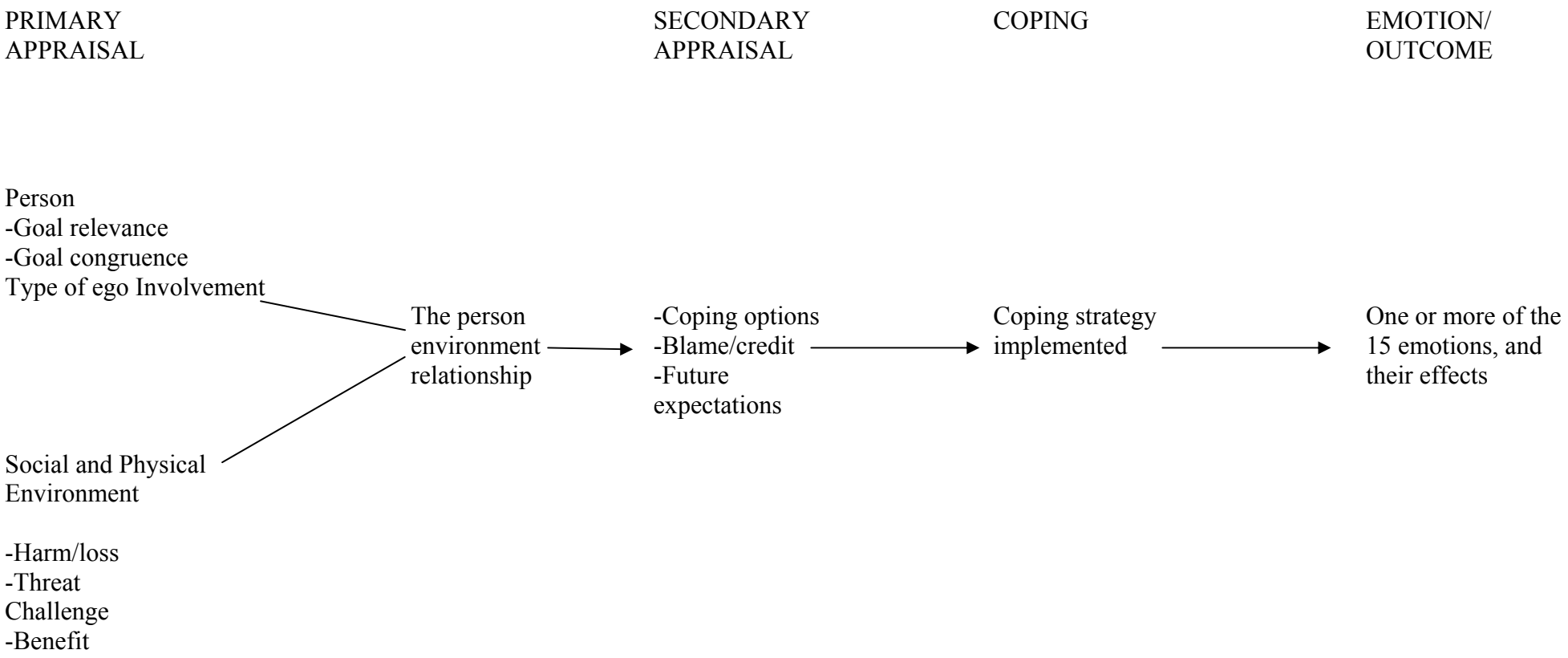
efforts, time management, goal setting and seeking information. Emotion-focused coping strategies involve efforts to regulate the emotional distress associated with the situation (Lazarus, 1999). Examples of emotion-focused coping strategies include relaxation, acceptance, seeking social support, wishful thinking and rationalisation. Although these coping strategies are suggested to be completely distinct, Lazarus suggests that both forms of coping can reduce psychological distress and that individuals use both problem-and emotion-focused coping in most stressful episodes (Folkman & Lazarus 1980; Lazarus, 1993). Recently, a third higher order factor has been proposed, avoidance coping. This includes both behavioural (e.g. removing the self from the situation) and psychological (e.g. cognitive distancing) efforts to disengage from a stressful situation (Krohne, 1993).

Coping is proposed to have a hierarchical organisation with coping actions categorized into coping strategies and coping strategies being categorized into higher-order dimensions of coping (Gaudreau, Ali, & Marivain, 2005). There has been a debate concerning measuring coping at the strategy vs. higher-order dimension level within the mainstream psychology literature (see Skinner, Edge, Altman, & Sherwood, 2003 for a review). A limitation of assessing coping within higher-order dimensions (e.g., emotion-orientated, problem-orientated, and avoidance-orientated) is that a single coping strategy could be classified within more than one dimension (Compas Worsham, Ey, & Howell, 1996), making it impossible to accurately classify a coping strategy. Measuring coping at the strategy level illustrates the way people actually respond to stress (Lazarus, 1996). They provide the mechanisms by which individuals deal in the short and long-term with stressors (Skinner et al., 2003).

The last stage in the transactional model refers to emotions. These are an integral part of the coping process during a stressful situation, as an outcome of coping, as a response to new information, and as a result of reappraisals during the status of the

event (Folkman & Moskowitz, 2004). As suggested by Lazarus (2000) an emotion is: "an organized psycho physiological reaction to ongoing relationship with the environment" (p. 230). According to Lazarus (1999) there are 15 emotions which he classified into: nasty emotions (e.g., anger, hostility, envy and jealousy), existential emotions (e.g., anxiety, guilt, and shame), emotions provoked by unfavourable life conditions (e.g., relief, hope, and sadness-depression), empathic emotions (e.g., gratitude and compassion), and finally emotions provoked by favourable life conditions (e.g., happiness, pride, and love).

Figure 1. A revised model of stress and coping, adapted from Lazarus (1999).



2.2. THEORETICAL APPROACHES TO COPING

The scientific literature investigating coping has adopted different definitions and descriptions of coping. The theoretical orientation chosen to investigate coping in a study is extremely important because it directs the types of factors the researcher considers in studying influences on coping (Aldwin, 2007). Coping, in this respect, can be viewed from a person-based, situational-based, interactive or transactional perspective. The person-based approach assumes that differences in coping preferences are the result of differences in personality and that an individual's coping preferences are relatively consistent across stressful events and time (Anshel, Jamieson, & Raviv, 2001a). The typical theoretical framework underlying the study of coping style at the macro level of coping dimensions has been the approach vs. avoidance coping distinction (Krohne, 1993; Roth & Cohen, 1986). Approach coping involves confronting the source of stress and deliberate attempts to reduce it whereas avoidance coping includes both behavioural and cognitive efforts to disengage from a stressful situation (Krohne, 1993; Roth & Cohen, 1986). The situational-based approach, on the other hand, suggests that environmental or situational factors determine coping preferences. The interactive approach assumes that both the person and the environment determine the coping strategies employed by individuals (Aldwin, 2007). Finally, the transactional perspective (Lazarus & Folkman, 1984) suggest that coping with stress is a dynamic and recursive process that involves a transaction between a person's internal (e.g., goals, values) and external (e.g., situational) environments. This approach requires a larger, or more contextual, view of the situation and suggests that coping preferences may change in response to its effects on the situation (Lazarus & Folkman, 1984). Coping outcomes in turn influence subsequent appraisal as well as the person and environment.

Most of the research conducted in the sport domain has adopted a person-based approach or the transactional perspective. In a systematic review examining the evidence for both perspectives in sport, Nicholls and Polman (2007a) found that the majority of the literature in sport psychology found support for the view that coping is both recursive and dynamic. These findings indicate that athletes do not have preferred coping styles or that the situation determines coping, instead their coping preferences vary according to previous experiences and appraisal of the situation, supporting in this way the transactional perspective of coping. On the whole, the psychological literature has supported the framework of Lazarus and Folkman. For example, recent books by leading authors on stress and coping have adopted this perspective (Aldwin, 2007; Nicholls, 2010). Similarly, a recent meta-analysis by Tamres, Janicki, and Helgeson (2002) on gender differences in stress and coping adopted this theoretical framework. On the whole the transactional perspective proposed by Lazarus and Folkman (1984) is well supported by the scientific literature, this is in contrast to other frameworks. Therefore, the present thesis will adopt the transactional framework to define and measure coping.

2.3. FACTORS INFLUENCING COPING

As suggested by Nicholls and Polman (2007a) the stress and coping process is influenced by moderators such as gender, age, ethnicity, motivational orientation, self–confidence, trait anxiety and optimism. In support of this idea a meta-analyses by Tamres et al. (2002) in the health domain, found support for the common belief that males and females differ in coping preferences. Nevertheless, little is known about the influence of gender on coping in the sport context and findings have been equivocal.

Although previous studies comparing coping of individuals across a variety of stressful situations in the health domain (Lee-Baggley, Preece & DeLongis, 2004; O'Brien & DeLongis, 1996) have found that the characteristics of the stressor account

for variance in coping preferences, personality clearly plays an important role in almost every aspect of the stress and coping process (DeLongis & Holtzman, 2005). Personality factors can influence coping preferences in a direct way, by restricting or assisting the use of specific strategies or in an indirect way by influencing the type and appraisal of the stressor experienced (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005).

Nevertheless, it is unclear whether findings from other life domains also apply to the sport context. In particular, to date very few studies have investigated the influence of personality on coping in sport (Nicholls & Polman, 2007a; Richards, 2004). Therefore, this thesis will investigate the influence of the moderators gender and personality on coping preferences in sport, and as such will provide a novel contribution to the existing literature on stress and coping.

2.3.1. Gender Differences in Coping: Theoretical Explanations

Gender differences have been found across different domains in the literature such as personality, expression of emotions and behaviours. Social stereotypes exist which suggest that females are more friendly and nurturant than males (Eagly, Mladinic, & Otto, 1991). A meta-analysis by Dindia and Allen (1992) showed that females share more personal information about their lives, thoughts, and feelings than males. Females also express negative feelings, such as sadness and depression, more than males (Zeman & Garber, 1996), whereas males express anger more than females (Clark & Reis, 1988). Furthermore, as suggested by Lippa (2005), males and females may express and experience emotions differently as males are more sensitive to internal cues and females are more sensitive to external cues. Generally, females express their emotions through many different modalities: facial expression, verbal expression, and physiological

response (Lippa, 2005). This line of research suggests that females may be more likely than males to cope with stress using emotion-focused coping strategies.

It is unclear whether gender differences in emotional expression are learned or innate. Some evidence has emerged (Grossman & Wood, 1993) that gender differences in the expression of emotion are larger in males and females who have stronger stereotypes about gender and emotions. This suggests that gender differences in emotional expression are the result of the learned stereotype that females express more their emotions than males, rather than innate differences in emotion expression across males and females. In this way gender differences in emotion expression are explained by the social role theory (Eagly, Wood, Schmidt, 2004). This theory suggests that differences in behaviour among males and females are caused by the impact of the distribution of males and females into social roles within society (Eagly, 1987). As explained by Wood and Eagly (2002) these gender differences in behaviour are due to the inherent sex differences that cause certain activities to be accomplished more successfully by one gender or the other, depending on societal circumstances and culture. Thus, according to the social role theory, gender can be seen as an important feature in all societies, yet many of the specific behaviours typical of males and females vary greatly from society to society. As an example of this, in industrialized societies, husbands are more likely than wives to be the main family provider, and in workplaces males are more likely than females to hold positions of authority. These gender differences in typical family and occupational roles, suggest that males possess directive leadership qualities (Eagly & Karau, 2002). In addition, biological processes, including hormonal changes orient males and females to certain social roles and facilitate role performance. Thus, biological processes, along with gender roles, and specific roles occupied by males and females (e.g., occupational and marital roles) guide social behaviour and may result in gender differences in behaviour (Eagly et al., 2004).

In their meta-analysis in the health domain Tamres et al. (2002) found differences in coping preferences among males and females. In particular females were more likely to use strategies that involved verbal expressions to others or the self, seek emotional support, ruminate about problems, and use more positive self talk than males. In order to explain these results the authors suggested that biological reasons associated with sex differences rather than the social category of gender was a more viable explanation. In particular, the pituitary hormone oxytocin could be a potential explanation for biological differences. The release of oxytocin during times of stress is associated with down regulation of the sympathetic nervous system and facilitation of the parasympathetic nervous system (Tamres et al., 2002). As suggested by Taylor, Klein, Lewis, Gruenewald, Gurung, and Updegraff (2000) this neuroendocrine activity is associated with a pattern of tend-and-befriend rather than fight-or-flight. Since females have increased oxytocin activity this could explain why they are more likely to use social support as a coping strategy.

It is not clear from the previous research whether observed gender differences in coping are innate or learned, however, it is evident that there are characteristic differences among males and females and this is affecting coping preferences. The *dispositional hypothesis* therefore suggests that males and females have different underlying characteristics that cause different coping preferences (Tamres et al., 2002). These underlying differences can be biological or social in nature and include variation in emotional expression, social support seeking, response to stress, and socialization. By contrast, the situational hypothesis (Tamres et al., 2002) also referred to as role constraint theory (Rosario, Schinn, Morch, & Huckabee, 1988) suggests that situations influence coping preferences. Differences in coping preferences in this view are the result of the dissimilar roles males and females occupy in society (Eagly et al., 2004) and the different stressors they encounter. In this way, if males and females were treated

the same and gender stereotypes were abolished many behavioural gender differences would disappear. According to this perspective gender is not something we are, rather something we do (West & Zimmerman, 1991).

It is well accepted that males and females occupy different roles in society, females are more responsible for childcare and domestic duties and males are more responsible for hunting, fighting and income-producing work (Eagly et al., 2004). These roles and discrepancies remain consistent in the workplace with females having lower status jobs than males and lower pay for comparable work (U.S. Bureau of Labor Statistics, as cited in Tamres et al., 2002). These role differences are likely to influence the appraisal process for males and females. For example, when experiencing the same stressor, for instance work, males will probably experience less stress and more control over that stressor than females, resulting in different coping preferences. If this was the case, role constraint theory rather than the dispositional hypothesis would explain gender differences in coping preferences.

A particular setting where gender roles play an important part is sport (Schmalz & Kerstetter, 2006). As suggested by Woolum (1998) and Sherrow (1996) in the past, sport has traditionally been restricted to and associated with males, and masculinity stereotypes. Metheny (1965) identified several gender stereotypes, (i.e., it was not appropriate for females to engage in contests where the body is projected through space over long distances, or for extended periods of time or which involve the resistance of the opponent overcome by bodily contact) in her classic analysis of the social acceptability of various sports. In addition, previous research in American society has suggested that participation in sport is primary a masculine activity (Czisma, Wittig, & Schurr, 1988). In this way, males were expected to demonstrate certain characteristics and behaviours that were "masculine", whereas females were expected to be "feminine". According to Sherrow (1996), the principle of femininity or being feminine

relates to appearance and behaviour (i.e. being attractive, carefully groomed, submissive, and nurturing). It is clear that these attributes are unlikely to be associated with involvement in activities that include sweat, aggression, and competition such as sport, limiting in this way female participation in these activities. Gender role stereotypes in sport encourage males to participate in strenuous, aggressive, competitive team sports, while females are commonly steered toward individual aesthetically pleasing activities such as gymnastics, figure skating, and synchronized swimming (Schmalz, & Kerstetter, 2006). However, as suggested by the same authors, it is clear that over the years society has undergone a number of changes (i.e., Title IX of the Educational Amendments created in the United States to prohibit sex discrimination in education programs that receive federal financial assistance; media coverage on female success in sport) that resulted in an increase of female participation in sport, thus contributing to the integration of females in the sports world. In addition, female's athletic ability is highlighted more frequently in sports that have been traditionally considered masculine such as basketball, soccer, and ice hockey (Colley, Nash, O'Donnell, & Restorick, 1987; Koivula, 1995; Matteo, 1986). However, despite these efforts and successes, stereotypes of "appropriate" and "inappropriate" sports for male and female persist (Riemer & Visio, 2003). In support of this idea, Schmalz and Kerstetter (2006) reported that participation in sports perceived as gender specific was noticeably different between the males and females. In particular the authors found three significant findings (p. 550 & 551). Firstly, children limited their behaviours and sports participation to fit the social norms of appropriate behaviours based on gender. Secondly, gender neutral sports (such as swimming, running, soccer, and bicycling) had the highest participation rates for boys and girls. Thirdly, "*children as young as eight* are aware of and affected by gender stereotypes in sports and physical activities". These findings suggest that although society is more aware of gender stereotypes in sport and

physical activity, traditional female gender stereotypes do still exist. In agreement with this idea Gill (2004) suggested that although actual differences between male and female on competitiveness and independence are small and inconsistent (e.g., Bem, 1985; Deaux, 1984; Deaux & Kite, 1993), society tends to exaggerate minimal differences into larger perceived differences, and these perceptions exert a strong influence that may elicit further gender differences. Based on the author's work on competitive sport orientation (1988, 1993), Gill (2004) concluded that gender differences in competitiveness are limited and do not seem to reflect either general achievement orientation or interest in sport and exercise activities per se. Instead, competitiveness seems to reflect opportunity and experience in competitive sport, and gender influence is more evident when there is an emphasis on social comparison and winning within sport (Gill, 2004). This suggests that gender influences on competitiveness may be more related to social stereotypes, rather than gender differences per se. Thus, as suggested by Gill (2004), in order to make contributions to the real world of developing sport and exercise, it is essential that researchers incorporate gender and cultural analyses in their studies. In particular, as suggested by Hoar, Kowalski, Gaudreau, and Crocker (2006) future research analyzing gender and coping in sport should be aware of how social roles may potentially interact and affect coping.

Taking into consideration that previous research has often not defined a common stressor among male and female athletes and has not assessed the appraisal process in terms of stress intensity and perceptions of control, gender differences could be due to the fact that males and females face different sources of stress in sport or appraise the same stressors differentially (Tamres et al., 2002). In this way, the dispositional hypothesis would predict that gender differences in coping will be found across situations and social roles whereas the situational hypothesis/role constraint theory

predicts that gender differences will disappear when males and females would face the same stressor and take on similar social roles (Sigmon, Stanton, & Snyder, 1995).

2.3.2. GENDER & COPING IN SPORT

To review the literature on gender and coping in sport a systematic review of the recent literature (1990 to February 2009) was conducted. The choice of a systematic review rather than a meta-analysis was made for three reasons. First, a meta-analysis of the literature would not be suitable, as a 'meta-analysis is only properly applicable if the data summarized are homogeneous' (Eysenck, 1995, p. 70). As suggested by the same author systematic reviews are of use when there is a lack of homogeneity among participant sample sizes, methods of data collection, and variables measured. In this way, a lack of homogeneity among participant sample size, methods of data collection, and variables measured were found across the studies investigating gender differences in coping in sport (see Table 1, for a summary of the studies reviewed). Secondly, research in this area has expanded substantially in the last decade, which has resulted in the use of different methodologies and analyses of different variables. Therefore it is important to summarize the research findings to provide ideas for future research and practical interventions (Murlow, 1994). Thus, as mentioned previously when analysing different methodologies and different variables, a systematic review should be used rather than a meta-analyses (Eysenck, 1995). Finally, the inability to cope with stress in sport is a significant factor in the failure of athletes to function fully in many types of athletic performance (Lazarus, 2000). As suggested by previous research (Hammermeister & Burton, 2004; McLeod, Robert, Kirkby, & Madden, 1994; Yoo, 2001) gender appears to be a moderator variable influencing the stress and coping process. It is therefore essential that researchers, coaches and sport psychology practitioners have a greater understanding of gender as a moderator variable influencing

the stress and coping process in sport in order to develop successful psychological interventions. In this way the current systematic review will contribute significantly to establish generalizability of scientific findings across populations and settings (Murlow, 1994).

In this review it was attempted to (a) examine what type of studies have been conducted and the theoretical perspective adopted, (b) examine whether males and females differ in appraisal of stressors in terms of stress intensity and perceived control, (c) examine gender differences in coping with stress, and (d) examine the evidence for both the situational and dispositional hypotheses in sport.

2.3.2.1. METHODS OF DATA COLLECTION

The methodology used for the systematic review was based on the guidelines described by Chalmers and Haynes (1995), Lloyds Jones (2004), and Mulrow (1995). Guidelines for taxonomy and reporting were also provided by an editorial on literature reviews published in the Psychological Bulletin (Cooper, 2003).

2.3.2.2 .TYPE OF STUDIES AND REVIEW CONSTRAINTS

Studies were considered for inclusion if they provided quantitative or qualitative data on gender differences in coping in sport and had been published as full papers. As recommended by Knipschild (1995) studies have been excluded if they had been published as abstracts or conference proceedings. Studies were excluded if the mean age of participants was less than 18 years old. All studies were obtained through electronic searches on SPORTdiscus, Medline, PSYCHinfo , PSYCHarticles (1990 to February 2009).

2.3.2.3. SIFTING RETRIEVED CITATIONS

As recommended by Lloyd Jones (2004), and Meade and Richardson (1997) sifting was carried out in three stages (see Figure 2). Papers were first reviewed by title, then by abstract, and finally, by full text (Lloyd Jones, 2004). The key word *coping* in combination with *gender* and *sex* and with *sport* and *exercise* were used.

From the search 7451 papers were removed after reading their title during the first stage of sifting. Following this stage, 104 articles were scanned by abstract and 88 were excluded from the study at this stage of sifting. A total of 36 papers were screened, 23 of which were excluded. In addition reference lists of papers were scanned for relevant studies. Based on this another nine studies were screened, six of which were excluded. In total 16 papers were included in the systematic review (see Figure 2).

2.3.2.4. STUDY DESIGN AND PARTICIPANTS

Of the 16 papers in this systematic review, 15 (95%) were quantitative and one (5%) was qualitative, using concept maps (see Table 1). The number of males in the quantitative studies ranged from 31 to 332 (mean = 181.5, *SD* = 212.8). The number of females in the quantitative studies ranged from 20 to 332 (mean = 176, *SD* = 220.6). The mean age of male participants in the quantitative studies ranged from 18.1 to 33.8 years (Weighted means = 23.1, Pooled *SD* = 6.4). The mean age of females participants in the quantitative studies ranged from 18.1 to 36.9 years (Weighted means = 22.7, Pooled *SD* = 6.4). The number of participants in the qualitative study was 749. The mean age of participants in the qualitative study was 19.8 years for both males and females.

Figure 2: Summary of study selection and exclusion – all electronic literature searches.

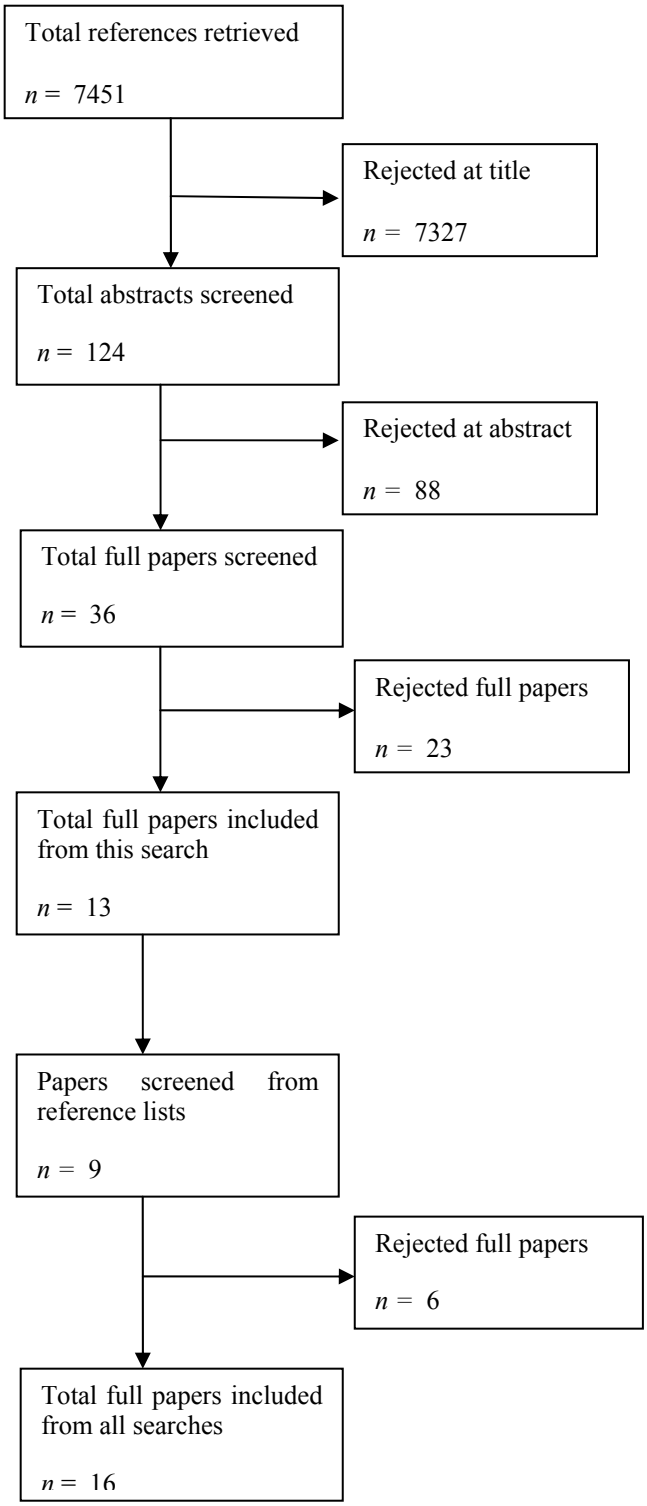


Table 1: Gender and Coping in Sport: A Summary.

Study	Participant information	Method & Framework	Instrumentation	Type of Stressors	Stress intensity appraisal	Control appraisal	Gender Differences
Anshel & Sutarso, 2007	N = 331 (176M; 156F) Age: 21.6 years Former & current sport competitors from various high school sports	Quantitative Trait	SAS Study specific coping inventory 3 dimensions *AppBeh, AppCog, AvCog*	Experimenter defined: Performance and coach related	Yes	No	When facing a performance related stressor females used more AppBeh, whereas males were more likely to use AppBeh, followed by AppCogn but not AvCog. Study did not control for stress intensity appraisal when comparing gender differences in coping.
Anshel & Kassidis, 1997	N = 190 (93M; 97F) Age: 18-44 years Basketball players from various levels	Quantitative Transactional	Miller BSC CSIA	Experimenter defined	Yes	Yes	For the stressor missing a 'lay up' males used more approach coping than the females. Stress intensity and control appraisal were not used as control variables when comparing gender differences in coping.
Anshel et al., 1998	N = 477 (288M; 189F) Age: 15.8- 20.3 years National + club athletes from variety of sports	Quantitative Not specified	Study specific coping Survey	Experimenter defined	No	No	Gender differences existed for each source of stress. Males used more approach coping after each acute stressor. Overall, males and females were more similar, than different in coping patterns.
Anshel et al., 1997	N = 633 (290M; 359F) Club to international athletes from USA (*n*= 296), Age: 20.7 years; Australia (*n*=337) Age: 20.6 years	Quantitative Trait	Study specific Coping inventory (134 items)	Experimenter defined	No	No	Female athletes employed more approach-emotion coping strategies than males.
Anshel et al., 2001a	N = 251 (174M; 77F) Age: 23.7 years Athletes from a variety of sports. Level not reported.	Quantitative Transactional	CSIA	Experimenter defined	No	No	Females used more avoidance coping than males for the crowd stressor. Coping with acute stress was more similar than different between genders.

Study	Participant information	Method & Framework	Instrumentation	Type of Stressors	Stress intensity appraisal	Control appraisal	Gender Differences
Anshel et al., 2001b	N = 251 (174M; 77F) Age: 23.7 years Athletes from a variety of sports. Level not reported.	Quantitative Transactional	CSIA	Experimenter defined	No	No	No coping differences reported.
Bebetsos & Antoniou, 2003	N = 85 (44M; 41F) Age: 22.3 years National badminton players Not specified	Quantitative	GVAC-28	Not relevant	No	No	No gender differences in psychological skills.
Campen & Roberts, 2001	N = 51 (31M; 20F) Age: 37 years Recreational runners	Quantitative Transactional	Study specific coping Inventory CSAI-2 STAI	Self selected but related to upcoming competition	Yes (state Anxiety)	No	No gender differences on anxiety measure. Females were more likely to use social supportive strategies than males. Did not control for appraisal in coping analysis.
Crocker & Graham, 1995	N = 377 (208M; 169F) Age: 20.5 years Regional to national athletes from variety of sports	Quantitative Transactional	COPE PANAS PGI	Self selected	Yes (goal incongruence)	No	Females used higher levels of SESS and increasing effort to manage goal frustration. Did not control for stress appraisal in coping analysis.
Goyen & Anshel, 1998	N = 65 (37M; 28F) Age: 26.6 years Club athletes	Quantitative Transactional	Study specific Coping Survey	Experimenter defined	Yes	No	Gender differences in stressor type and stress intensity. Males reported more problem-focussed coping than females, whereas females reported more emotion-focused coping. Did not control for appraisal in coping analysis.
Hammermeister & Burton, 2004	N = 315 (209M; 106F) Club to professional tri-athletes, age: 35 years: Distance runners, age: 38 years; Cyclists, Age: 28 years	Quantitative Transactional	EADBQ CESQ PTCEGI PCCEGTI CSAI-2	Self selected but related to upcoming event	Yes	Yes	Males and females do not differ on types and degree of threat. However females perceived less control over environmental threats than did males. Females used more emotion-focused and males more problem-focused coping. Did not control for appraisal in coping analysis.
McLeod et al., 1994	N = 73 (43M; 30F) Age: 22.9 years Elite basketball players N = 133 (84M; 49F) Age: 23.8 years Non-elite basketball players	Quantitative Not specified	WOCS	Self selected	No	No	Females reported greater use of seeking social support.

Study	Participant information	Method & Framework	Instrumentation	Type of Stressors	Stress intensity appraisal	Control appraisal	Gender Differences
Nicholls et al., 2007	N = 749 (455M; 294F) Age: 19.8 years Athletes from different sports and skill levels	Qualitative Transactional	Concept maps	Self selected	No	No	Females used problem-focused coping more frequently than males.
Pensgaard & Roberts, 2003	N = 69 (50M; 20F) Age: 25.2 years Elite athletes from Winter Olympic sports	Quantitative Transactional	POSQ COPE	Self selected	No	No	High ego orientation was associated with less use of active coping and planning strategies among females and more use of denial, but not male athletes.
Philippe et al., 2004	N = 80 (44M; 36F) Age: 23.1 years Athletes from different sports and skill levels	Quantitative Trait	CISS	Self selected	No	No	Males showed higher task focused coping than females.
Yoo, 2001	N = 532 (332M; 200F) Age: 21.2 years Elite and non elite athletes from various sports	Quantitative Trait	CSKA	Self selected	No	No	Males were more likely to use problem-focused coping than females, whereas females reported higher transcendent and EFC.

Note: SAS = Sources of Acute stress (Fisher & Zwart, 1982; Madden, Summers & Brown, 1982); Miller BSC = Behavioural style scale (Miller,1987); CSIA = Coping Style Inventory for Athletes (Roth & Cohen framework); GVAC-28 = Greek Version of Athletic Coping-28 (Goudas et al., 1998); AARS = Adolescent Anger Rating Scale (Burney, 2001); EFC-= Emotion Focused Coping; PFC = Problem Focused Coping; CDS II = Causal Dimensions Scale II; COPE= Coping Inventory (Carver et al., 1989); PA = Positive Affect; NA = Negative Affect; SESS = Seeking social support for emotional reasons; PANAS = Positive and Negative Affect Schedule (Watson et al., 1988); PGI = Performance goal incongruence (Crocker & Graham, 1995); CICS- Coping Inventory for Competitive Sport (Gaudreau & Blondin, 2002); EADBQ = Endurance Athlete Demographic and Background Questionnaire (Hammermeister & Burton, 2001); CESQ = Coping with Endurance Sports Questionnaire (Hammermeister & Burton, 2001); PTCEG1 = Perceived Threat to Competitive Endurance Goals (Hammermeister & Burton, 2001); PCCEGTI = Perceived Controllability of Competitive Endurance Goals Inventory (Hammermeister & Burton, 2001) ; CSAI-2 = Competitive State Anxiety Inventory- 2 (Martens, Burton, Vealey, Bump, & Smith, 1990); STAI = State Trait Anxiety Inventory (Spielberg et al., 1983); Self Esteem - Rosenbergs' Self Esteem Scale (Rosenberg, 1965); MCOPE = Modified Version of the COPE (Crocker & Graham, 1995); Self efficacy – Bandura (1997); WOCS = Ways of Coping with Sport; CISS= Coping Inventory for stressful situations (Endler & Parker, 1990); POSQ- Perception of Success Questionnaire (Roberts, Treasure, & Balague, 1998); SARRS = Social and Athletic Readjustment Rating Scale; ALES= Athletic Life Experiences Survey; ACSI= Athletic Coping Skills Inventory (Smith, Schutz, Smoll, & Ptacek, 1988); CSKA = Coping Scale for Korean Athletes (Yoo, 2000).

2.3.2.5. RESULTS

2.3.2.5.1. THEORETICAL FRAMEWORK ADOPTED TO ASSESS COPING

Studies used different theoretical frameworks to analyse coping. Of the 16 papers in this systematic review nine used the transactional perspective to analyse coping whereas four studies used the trait perspective. In the other three studies it was not clear which theoretical framework was adopted by the authors (see Table 1).

2.3.2.5.2. NATURE OF STRESSOR EXPERIENCED BY THE ATHLETES

Studies in this systematic review used different methods to define stressors and in some cases the stressor was not specified explicitly. From the 16 studies, seven adopted the researcher-selected paradigm. In these studies the athlete participants reported what they usually did to cope with multiple researcher defined but commonly experienced stressors in their respective sport. The self-selected paradigm was used in eight studies. Athletes were asked to recall stressful events they commonly experience in their respective sports. Two of these studies defined the event or the time that athletes should refer to (Campen & Roberts, 2001; Hammermeister & Burton, 2004). Five of these studies (Crocker & Graham, 1995; McLeod et al., 1994; Pensgaard & Roberts, 2003; Philipe, Seiler, & Mengisen, 2004; Yoo, 2001) asked participants to 'refer to a situation where they experienced problems in performance'. A study by Nicholls et al. (2007) used concept maps and asked participants to describe a maximum of six worries that they have experienced over the past week. Finally, in one study the nature of the stressor was not specified (Bebetsos & Antoniou, 2003).

2.3.2.5.3. APPRAISAL OF STRESS INTENSITY AND CONTROL

Six of the included studies assessed stress intensity. Of these six studies, two studies also measured control perceptions. However, none of these studies controlled for stress intensity or perceived control appraisal when comparing the use of coping strategies reported by the male and female athletes.

2.3.2.5.4. MALE AND FEMALE COPING PREFERENCES IN SPORT

Of the 16 papers in this review 12 explicitly analysed gender differences in coping. The remaining four studies examined gender differences in coping on a *post-hoc* basis. That is, gender differences were not part of the initial aim of these investigations. From the 16 studies in this review, 13 supported the common belief that males and females differ in the coping preferences, one study reported no gender differences in coping in sport, one study found partial support for gender differences in coping (Anshel et al. 2001a), and another study despite being one of its explicit aims did not report findings on coping (Anshel, Jamieson, & Raviv, 2001b).

2.3.2.5.5. PROBLEM-FOCUSED COPING

From the 13 studies reporting gender differences in coping preferences, seven studies found support for the commonly held belief that males use more problem-focused coping strategies in response to stressors than females. Conversely, one study assessing coping at the dimensional and strategy level concluded that females used more problem-focused strategies (Nicholls et al., 2007). From the seven studies which found that males use more problem-focused coping, three assessed coping only at a dimensional level. In these studies males were found to use more approach-cognitive coping (Anshel & Sutarso, 2007), task-orientated coping (Philippe et al., 2004), and

problem-focused coping than females (Yoo, 2001). Finally, four studies assessed coping at both the dimensional and strategy level. These studies found that males used more approach-coping (Anshel & Kassidis, 1997; Anshel, Porter, & Quek, 1998), and problem-focused coping (Hammermeister & Burton, 2004; Goyen & Anshel, 1998) than the females.

2.3.2.5.6. EMOTION-FOCUSED COPING

From the 13 studies reporting gender differences in coping, seven studies reported that females used more emotion-focused coping strategies than the male athletes. One of these studies measured coping only at the dimensional level and found females scoring higher on emotion-focused coping than the males (Yoo, 2001). Two studies measured coping only at the strategy level found that females were more likely to use 'social supportive strategies' (Campen & Roberts, 2001; McLeod et al., 1994). The other four studies which assessed coping both at the dimensional and strategy level found that females used more approach-emotion coping strategies such as 'I felt anger toward the stressor' (Anshel, Williams, & Hodge, 1997), and emotion-focused coping (Goyen & Anshel, 1998) such as 'seeking emotional social support' (Crocker & Graham, 1995), 'positive reinterpretation, emotional social support, and dissociation' (Hammermeister & Burton, 2004) than the males.

One study by Pensgaard and Roberts (2003) analysed coping only at the strategy level and as a function of ego-orientation. They found that females high in ego orientation reported more use of denial as a coping strategy in comparison to the males. Finally, a study by Yoo (2001) reported an additional, culturally specific, higher order coping category, 'transcendental coping'. According to the author this type of coping appears similar to avoidance coping, however, it does not involve denial or attempts to avoid stress. As defined by the author the dimension of "transcendental control broadly

refers to elimination of any desires and expectations by means of self-acceptance and being independence over environment" (Yoo, 2000, p.393). In this study females used more transcendental coping than males.

2.3.2.5.7. GENDER DIFFERENCES IN COPING: DISPOSITIONAL OR SITUATIONAL HYPOTHESIS*?*

From the 16 studies included in this systematic review only four related their findings to gender theory on coping. Three studies (Hammermeister & Burton, 2004; Philippe et al., 2004; Yoo, 2001) claimed that they found support for the socialization model (Ptacek, Smith, & Zanas, 1992). This suggests that sex role stereotypes and role expectations predispose males and females to cope with stress differently, as such supporting the dispositional hypothesis (Tamres et al., 2002). The study by Crocker and Graham (1995) suggested that the design of the study did not allow support for the socialization model, as males and females did not experience a common stressor.

2.3.2.6. DISCUSSION

2.3.2.6.1. THEORETICAL FRAMEWORK ADOPTED TO ASSESS COPING

This systematic review found that the majority of studies investigating gender differences in coping in sport adopted the transactional perspective, providing support for the rationale of this thesis. Adopting this framework suggests that coping preferences fluctuates based on the athletes appraisal of the situation and previous coping attempts (Nicholls & Polman, 2007a). Surprisingly, in a number of studies it was unclear what perspective was adopted by the researchers. It is believed that this limitation can result in poor research designs to investigate the coping process. In agreement with this Aldwin (2007) suggested that the theoretical orientation adopted by

researchers investigating coping directs the type of factors considered influencing the coping process. Thus, it is suggested that the lack of theoretical framework defined to investigate coping in some studies reduced their quality and its value as a contribution to the scientific literature. Hence, this has resulted in inadequate assessment of coping, premature conclusions, and lack of generalisability.

2.3.2.6.2. NATURE OF STRESSOR EXPERIENCED BY THE ATHLETES

The results show that the methodology used to define the nature of the stressor differed across the studies reviewed, some adopted an experimenter defined approach whereas others adopted a self selected approach, and in some cases the nature of the stressor was not reported (Bebetsos & Antoniou, 2003). Within the studies using an experimenter defined approach, some differences were found in the criteria selected to define stressors. In some studies (e.g., Anshel et al., 2001a; Anshel et al., 2001b) stressors were specified (i.e., making an error, pain, cheating opponent), whereas a study by Anshel and Sutarso (2007) classified stressors into categories such as performance-related and coach-related. These criteria were suggested to result in a meaningful generalization of the athlete's coping strategies (McCrae, 1992). However, as suggested by Nicholls et al. (2007) this categorization especially in the category of performance-related stressors includes numerous and different individual stressors.

In the studies using a self selected approach, some differences were also found in the methodologies used to recall the nature of the stressor. Two studies by Campen and Roberts (2001), and Hammermeister and Burton (2004) used a prospective design asking participants to anticipate the stressors experienced in an upcoming event. The other five studies (Crocker & Graham, 1995; McLeod et al., 1994; Pensgaard & Roberts, 2003; Philipe et al., 2004; Yoo, 2001) asked participants to 'refer to a situation where they experienced problems in performance'. It is believed that differences in

coping preferences found in these studies may be the result of the different nature of performance stressors referred to by males and females (Ptacek et al., 1992). In other words, gender differences in coping preferences found across these studies may be biased by the fact that male and female reported different performance stressors. In order to develop the research on gender differences in coping it is essential that the nature of the stressor remains constant for males and females in order to reduce possible gender differences in stressor type influencing the selection of coping strategies. In support of this suggestion Tamres et al. (2002) concluded in their meta-analysis that the nature of the stressor was an important moderator of gender differences. Hence, future research investigating gender differences in coping should use specific stressors which are experienced by both male and female athletes (Nicholls & Polman, 2007a).

2.3.2.6.3. APPRAISAL OF STRESS INTENSITY AND CONTROL

As suggested by Tamres et al. (2002) when comparing male and female coping preferences, it is crucial to determine whether both genders perceive the stressors as equally severe. Surprisingly, from the 16 studies reviewed only six assessed stress intensity and only two of these studies measured control. Previous research has shown that females tend to have higher levels of neuroticism (Costa, Terraciano, & McCrae, 2001; Feingold, 1994). High levels of neuroticism have been associated with higher levels of stress experienced (Gunthert, Cohen, & Armelli, 1999). This suggests that females may be more likely to experience a stressful situation with higher levels of stress intensity than males. If this is the case, than this would be a possible explanation for differences in coping preferences rather than gender per se. As suggested by Ursin and Eriksen (2003) as stress increases there is a neurophysiological activation from one level of arousal to more arousal. In this way, the greater use of emotion-focused coping strategies reported by female athletes might be due to the fact that they first regulate

their emotional arousal before adopting problem-focused coping strategies to deal with the stressor. Hence, it is difficult for individuals to make rational and logical decisions when they are in heightened emotional state. In such situations it would be advantageous to first lower emotions before invoking problem-focused coping strategies. Similarly, control perceptions have also been associated with the use of different coping strategies. For example, it has been found in situations in which the individuals perceive control it is more advantageous to use problem-focused coping strategies whereas emotion-focused coping strategies are better used in situations which are perceived as uncontrollable (Zakowski et al., 2001). However, limited conclusions can be drawn from this review as most studies did not assess perception of event control.

As suggested by Tamres et al. (2002) the best way to determine if stressor appraisal accounts for gender differences in coping is to analyze if gender differences disappear when stress appraisal is controlled for in a statistical analysis. However, none of these studies controlled for stress intensity or perceived control appraisal when comparing the use of coping strategies reported by male and female athletes.

2.3.2.6.4. MALE AND FEMALE COPING PREFERENCES IN SPORT

This review found partial support for the common belief that males and females differ in coping preferences in the sport setting. However, conclusions concerning gender coping preferences seem to be equivocal. From the 13 studies finding gender differences in coping, only three (Goyen & Anshel, 1998; Hammermeister & Burton, 2004; Yoo, 2001) support the belief that males use more problem-focused coping whereas females use more emotion-focused coping in sport. However, in some studies males were found to use more problem-focused coping but no differences in emotion-focused coping were observed (Anshel & Kassidis, 1997; Anshel & Sutarso, 2007;

Anshel et al., 1998; Philippe et al., 2004) whereas other studies found gender differences in emotion-focused coping but not problem-focused coping (Anshel et al., 1997; Campen & Roberts, 2001; Crocker & Graham, 1995; McLeod et al., 1994). Conversely, in one study (Nicholls et al., 2007b) it was found that females used more problem-focused coping and no gender differences in emotion-focused coping were reported.

The grouping of distinct coping strategies under broad dimensions such as problem or emotion-focused coping may be resulting in a poor generalization of the results. Additionally, as suggested by Tamres et al. (2002) this categorization may result in gender differences being limited to one or two strategies of these broad dimensions. Also, the studies included in the present systematic review adopted different higher order dimensions to classify coping, making it difficult to draw conclusions or generalize results. For example, in some studies problem-focused coping was used (e.g., Nicholls et al., 2007, Yoo, 2001) as a higher order dimension to classify coping strategies, some studies classified coping as approach-cognitive coping (e.g., Anshel & Sutarso, 2007), and in another study task-orientated coping was used (e.g., Philippe et al., 2004) to describe higher order coping dimensions.

The research designs used to investigate gender differences in coping in sport have generally been poor in the included studies. For example, in a number of studies there was no common stressor and stress appraisal was not assessed. In the instances that authors assessed stress intensity of perceptions of control they did not control for this in their statistical analysis. Tamres et al. in their meta analysis, found that females appraise stressors as more severe than males. Thus, it is suggested that previous research designs investigating gender differences in coping in sport may play a greater role in explaining gender differences in coping, rather than gender per se.

2.3.2.6.5. GENDER DIFFERENCES IN COPING: DISPOSITIONAL OR SITUATIONAL HYPOTHESIS?

This review aimed to examine the evidence for both the situational and dispositional hypotheses in sport. However, from all the 16 studies included in this systematic review only four (Crocker & Graham, 1995; Hammermeister & Burton, 2004; Philippe et al., 2004; Yoo, 2001) related their findings to gender theory. All of these studies found gender differences in coping in sport and three of them (Hammermeister & Burton, 2004; Philippe et al., 2004; Yoo, 2001) claimed support for the socialization model, supporting the dispositional hypothesis. The other study by Crocker and Graham (1995) suggested that the design of their study did not allow them to adequately test the dispositional hypothesis or the situational hypothesis as this research did not examine whether males and females experienced a common stressor. The dispositional hypothesis is supported for the gender differences in coping preferences that were consistent across stressor type (Tamres et al., 2002). The studies by Yoo (2001) and Philippe et al. (2004) reported gender differences in coping without males and females experiencing a common stressor, thus it is believed that their interpretation is spurious. In the Hammermeister and Burton (2004) study males and females appeared to be threatened to the same degree and experienced similar levels of cognitive and somatic anxiety in response to those threats. However, this study found that males and females differed in perceptions of control. Although females perceived less control over environmental threats than males, stress appraisal was not considered when analysing coping. In this way, the authors draw the premature conclusion that females use more emotion-focused coping whereas male use more problem-focused coping strategies. However, lower levels of control may result in the perception that problem-focused coping strategies are more risky, useless or even impossible. Males may engage in more problem-focused coping than females with respect to some

stressors such as work-related stressors, because these stressors are more likely to be perceived by males as amenable to personal control than females (Tamres et al., 2002). Sport stressors could be perceived differently by males and females because of stereotypes (see Metheny, 1965) and socialisation processes. Some authors have suggested that attitudes and values involved in the sport role (i.e., competitiveness, autonomy, and achievement) may interact with gender roles and maximize traditional masculine gender-roles and minimize traditional feminine roles (Gilll, 2003; Miller & Levy, 1996). It is believed that this interaction is likely to affect the appraisal of sport stressors and consequently coping preferences among male and females athletes. In other words, feelings of lower stress levels and higher control perceptions are more expected in males when experiencing a sport stressor, whereas females are more likely to experience higher stress levels and lower perceptions of control due to the conflict experienced between the values and societal expectations of femininity and the proscribed behaviours associated with sport (Czisma et al., 1988; Hoar, et al., 2006; Miller & Levy, 1996). In agreement with this idea, Hammermeister and Burton suggested that females may perceive less control over sport stressors than males because sport is likely to be more amenable to personal control for males than females. If this is the case, gender differences in coping observed in this study can possibly be a consequence of the different perceptions of control experienced by males and females when appraising the stressor, rather than gender differences in coping. Thus, the findings of this study should be explained by the role constraint theory or situational hypothesis (Tamres et al. 2002) rather than dispositional reasons as suggested by the authors. Although previous research (Anthrop & Allison, 1983; Archer & McDonald, 1990; Miller & Levy, 1996) failed to support the gender role conflict in female athletes, future studies in this area should consider that social roles in sport may possibly

influence gender differences in coping. Thus, nature of the stressor and stress appraisal should be consider when investigating gender differences in coping with stress in sport.

2.3.2.7. CONCLUSION

In order to reach conclusions whether males and females differ in coping preferences in sport, future studies need to provide a theoretical framework to investigate gender, and address methodological issues which may have affected previous findings. Although this systematic review found that most of the studies reviewed found gender differences in coping with stress, the findings of these studies are equivocal and questionable. Important aspects such as nature of the stressor, and stressor appraisal were not controlled for in any of the studies reviewed, limiting the answer to the question whether gender differences in sport are actually due to dispositional reasons or to situational aspects. Furthermore, future studies in this area should use a similar framework to investigate coping. As suggested by the results of the current systematic review and Nicholls and Polman (2007a) most of the research investigating coping in the sport provided support for the transactional model, suggesting that this perspective appears to provide an accurate framework to investigate coping in sport. Furthermore, the use of a common theoretical framework to investigate coping, will provide a greater consistency in the measurements and terminology used to classify coping and consequently improve conclusions and generalization of findings. Understanding more about male and female coping preferences is essential in sport and can assist both researchers and applied practitioners to develop a range of strategies to teach males and females to cope more effectively with stress in sport. Consequently, the use of effective coping strategies in sport will enable male and female to perform to the best of their ability and feel satisfied with their experience (Crocker, Alderman, & Smith, 1988).

2.3.3. Personality

Personality can be defined as 'a dynamic organisation, inside the person, of psychophysical systems that create the person's characteristic patterns of behaviour, thoughts and feelings' (Allport, 1961, p. 28). The present thesis has adopted the dispositional perspective. This perspective on personality has received the greatest research attention and support over the years (Larsen, & Buss, 2008) and would therefore be the most appropriate perspective. It suggests that individuals display consistency in their actions, thoughts and feelings. However, it also suggests that individuals differ from each other in a number of ways. In this respect the dispositional perspective suggests that personality consists of a pattern of relatively stable traits and the pattern of distribution of these traits differs from one individual to the next (Carver & Scheier, 2008).

An important issue to consider is what traits make-up personality. Although there have been a number of different approaches to identifying the traits underlying personality more recently evidence has emerged that there are five basic traits. These 5 traits or the Big Five are extraversion, neuroticism, agreeableness, conscientiousness and openness to experience. These five factors have been shown to transcend many boundaries of language and culture (e.g., Benet-Martinez & John, 1998).

The central goal of personality psychologists working in the dispositional domain is to identify and measure the most important ways in which individuals differ from one another (Larsen, & Buss, 2008). A crucial example where individuals seem to differ from each other is in coping preferences (e.g., Bolger & Zuckerman, 1995, Delongis, & Holtzman, 2005). As defined by Lazarus and Folkman (1984) coping is "a constantly changing cognitive and behavioural effort to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person"

(p. 141). As suggested by the mainstream psychology, personality has been considered a moderator factor that could influence each aspect of the stress-coping process (Delongis, & Holtzman, 2005). In particular, personality traits have been shown to influence the occurrence of certain events (Bolger & Schilling, 1991; Bolger & Zuckerman, 1995), appraisal of these events (Gunthert et al., 1999), tendency to engage in particular coping strategies (David & Suls, 1999; McCrae & Costa, 1986; Watson & Hubbard, 1996), and the effectiveness or outcomes of these strategies (Bolger & Zuckerman, 1995; Gunthert et al., 1999). As suggested by Lee-Baggley, Preece, & DeLongis (2005) the examination of the interaction between person and context is a promising avenue to explore in developing the understanding of the stress and coping process. In a study examining individuals across time in a variety of naturally occurring stress contexts DeLongis and Holtzman (2005) concluded that the use of coping depends upon the nature of the situation, personality of the individual, and the interaction between person and situational factors. The following section will review the possible mechanisms through which personality may influence the stress and coping process.

Firstly, depending on their dispositions, individuals may have different probabilities of encountering certain stressors. Evidence has emerged for the differential exposure hypothesis (Bolger & Zuckerman, 2005; Suls & Martin, 2005). In particular, individuals high on neuroticism have reported more interpersonal conflicts over a 2-week diary period than those lower in neuroticism (Bolger & Zuckerman, 1995). In addition, individuals high on neuroticism experience more negative events more frequently (Bolger & Zuckerman, 1995; Gunthert et al., 1999; Magnus, Diener, Fujita, & Pavot, 1993; Ormel & Wohlfarth, 1991) whereas extraverts report more positive events (Zautra, Affleck, Tennen, Reich, & Davis, 2005) and high levels of

agreeableness have been associated with fewer social conflicts (Asendorph & Wilpers, 1998).

Secondly, personality may influence the stress and coping process through appraisal (Rusting, 1998). As suggested by Semmer (2006), many personality variables are partially measured in terms of tendencies to perceive and interpret situations in a given way. For example, individuals high in neuroticism tend to appraise or construct events as more harmful or threatening (Eysenck, 1988; Suls & Martin, 2005). As proposed by Gunthert et al. (1999), people high in neuroticism would intensify the degree of threat perceived by undesirable events (i.e., primary appraisal), resulting in experiencing increased stress intensity, and underestimate their personal resources (secondary appraisal) to cope with the event resulting in lower perceptions of control over the situation. Conversely, individuals high on extraversion demonstrate positive appraisal of coping resources (Gunthert et al., 1999; Penley & Tomaka, 2002; Vollrath, 2001).

Thirdly, personality variables may influence the stress and coping process by reacting more or less strongly towards negative events that are appraised in similar ways. Reactivity is the extent to which a person is likely to show emotional or physical reactions to a stressful event (Bolger & Zuckerman, 1995). Research investigating stress reactivity has generally taken place in the laboratory. Laboratory stressors are assumed to be appraised similarly by individuals, assuring that differences observed are caused by reactivity rather than differences in appraisal (Suls & Martin, 2005). For example, individuals with high levels of neuroticism have been shown to 'magnify' the impact of negative events (Zautra et al., 2005) and they show intense emotional and physiological reactivity to stress (Connor-Smith & Flachsbart, 2007). Conversely, extraverts are characterized by an increased emotional and physiological response to positive events and low stress reactivity (Connor-Smith & Flachsbar, 2007; Eiss & Kurek, 2003), and

people high in agreeableness have been shown to react strongly to stressors related with social relationships (Suls & Martin, 2005).

Fourthly, research has shown that personality influences coping directly. That is, individuals with certain personality traits tend to use certain coping strategies more often than other people (Carver et al., 1989; Semmer, 2006). These direct effects of personality on coping may begin in early childhood, with biologically based appetitive, defensive and attentional systems providing the framework for coping development (Derryberry, Reed, & Pilkenton-Taylor, 2003). In other words, as suggested by Connor-Smith and Flachsbart (2007) personality may directly influence coping by withdrawal from threats, facilitating approach to rewards, and engagement or disengagement of attention. These biological tendencies may be influencing coping preferences through life. For example, the high energy and high social ability underlying extraversion may encourage the use of support seeking, whereas the threat sensitivity experienced by individuals high in neuroticism may encourage the use of avoidance coping. Bolger and Zuckerman (1995) showed that neuroticism played a role in the choice of coping strategy and its effectiveness when dealing with daily stressors. Individuals with a high level of neuroticism showed greater reliance on emotion-focused strategies and used less problem-focused coping strategies compared to individuals low in neuroticism. High levels of conscientiousness have been associated with more planning and rational decision making (Chartrand, Rose, Elliot, Marmarosh, & Caldwell, 1993; Vollrath, Banholzer, Caviezel, Fischli, & Jurgo, 1994) but less use of avoidant or emotion-focused coping such as self-blame, and distraction (Hooker et al., 1994; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

Finally, personality traits may influence the effectiveness of coping strategies. Coping effectiveness refers to the extent to which the coping efforts reduce the negative outcomes of the stressful event (Bolger & Zuckerman, 1995). When analyzing the

effectiveness of coping, it is important to bear in mind that coping strategies are not universally beneficial or detrimental. There is an important difference between using a coping strategy and using it effectively (Suls & David, 1996). However, most research in the area of coping effectiveness suggests that reliance on problem-focused, rather than emotion-focused or avoidance coping strategies, is related to more beneficial outcomes (Aldwin, 2007; Compas, Connor-Smith, Saltzman, Harding Thomsen, & Wadsworth, 2001). A possible explanation for this observation is that problem-focused coping assists in transforming the situation or solving the problem and thereby allowing the achievement of one's goals (e.g., Gaudreau & Blondin, 2002). In addition, problem-focused coping includes active problem solving, and requires engagement and ownership of solutions, which in turn helps the person to cope better with similar problems in the future. Emotion-focused coping might help the performer to lower stress reactivity but does not solve the problem whereas avoidance coping suggests that the person chooses not to deal with the problem and postpones problem solving to a later date. In both instances it is less likely that goals will be achieved. However, it should be kept in mind that coping strategies that are beneficial for some individuals may be less effective, or even harmful, for someone with different personality traits (Bolger & Zuckerman, 1995; DeLongis & Holzman, 2005). In support of this idea Connor and Flachsbart (2007) concluded that personality may influence coping by influencing the success of coping strategies. In daily report studies, evidence has emerged that people with high levels of neuroticism appear to experience poor coping outcomes (Holahan & Moos, 1987). In addition, previous findings suggest that those high on neuroticism are less likely to change their coping strategy in response to the needs of the situation (Lee-Baggley, & DeLongis, 2005). This lack of flexibility in coping strategies used by people high in neuroticism can also be a factor contributing to their unsuccessful outcomes. As suggested by Lazarus and Folkman (1984) being

flexible in one's coping skills is a strong predictor of coping effectiveness. In addition, although those high on neuroticism might use coping strategies which are assumed to be effective like problem solving, the use of these strategies tends to be ineffective to the particular situation which they are coping with (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005). Furthermore, individuals high in neuroticism tend to use more coping strategies overall. This might indicate that they have difficulty in finding the most appropriate coping strategy for particular stressful events (Suls & Martin, 2005). On the other hand, high levels of extraversion have been associated with less use of ineffective forms of emotion-focused coping such as self blame, wishful thinking, or avoidance coping (Hooker et al., 1994). Also, individuals high on extraversion are said to be flexible copers who are able to adapt their coping response based on the situation (Lee-Baggley et al., 2005).

In sum, previous research in other life domains including health and relationships has suggested that personality plays a role in the stress and coping process either indirectly through differential experience of stress exposure, appraisal, reactivity or coping effectiveness, or directly by influencing coping. As suggested by Suls and Martin (2005), and Semmer (2006), these mechanisms are not independent from one another, and they may well combine into a 'cascade'. In other words, people with lower levels of neuroticism may encounter less stressful situations during their life, tend to perceive a particular stressor event as a challenge rather than a threat, and have a better coping strategy to deal with a stressor compared with individuals high in neuroticism. These various aspects are likely to influence the stress and coping process either independently or by converging with each other. Because coping aims to match the demands of the situation, and because the nature and context of stress influences relations between personality and coping (e.g., Lee-Baggley et al., 2005), as suggested by Connor and Flachsbart (2007), future studies should focus on responses to specific

stressors, with attention to the specific impact of the domain, severity, and controllability of the stressor. Further knowledge into the relationship between personality and coping is required, in order to design effective intervention programmes that fit individual needs.

2.3.3.1. BIG FIVE

The Big Five factor model has been found particularly useful in understanding coping (Lee-Baggley et al., 2005). The Big Five factor model is a broad-based taxonomy of personality traits that arguably represent the minimum number of traits needed to describe personality (Costa & McCrae, 1985; David & Suls, 1999). These personality dimensions are neuroticism (N), extraversion (E), openness to experience (O), agreeableness (A), and conscientiousness (C). Research examining the role of personality in coping strategy use has mainly concentrated on the role of neuroticism and extraversion, resulting in limited knowledge about the other dimensions. However, studies examining the five traits of personality and coping (David & Suls, 1999; Hooker et al., 1994, O'Brien & DeLongis, 1996) have suggested that all these dimensions play a role in influencing the stress and coping process. As reviewed below, these traits are likely to directly facilitate or constrain coping.

Neuroticism (N). Individuals high on this trait are likely to experience negative emotions such as depression, anxiety, or anger and tend to be impulsive and self conscious (McCrae, 1992; McCrae & Costa, 1987). As suggested by Connor-Smith and Flachsbart (2007) high levels of neuroticism involve intense emotional and physical responses to stress, therefore they should be linked to attempts to minimize arousal such as through emotion-focused strategies (venting) and disengagement strategies. Disengagement coping strategies involve distancing oneself from the stressor or related feelings. On the other hand, emotion-focused coping involve efforts to regulate the

emotional distress associated with the situation (Lazarus, 1999). Examples of emotion-focused coping are relaxation and deep breathing whereas examples of disengagement coping strategies are avoidance, and withdrawal, (Connor-Smith & Flachsbart, 2007). In addition, individuals high on neuroticism have also been found to report lower levels of problem-focused coping than those lower on this trait (David & Sulls, 1999; Endler & Parker, 1990; Gunthert et al., 1999; O'Brien & DeLongis, 1996). A possible explanation for this fact, as suggested by Connor-Smith and Flachsbart (2007), may be that emotional and physiological arousal are likely to interfere with primary and secondary control engagement strategies which require planning and regulation of thoughts. This makes it more difficult for the individual to use engagement coping strategies such as active attempts to manage a situation or associated emotions (Connor-Smith & Flachsbart, 2007). Furthermore, as suggested by Bolger and Zuckerman (1995), even in situations when those high in neuroticism use adaptive coping strategies such as problem-focused coping, the use of these strategies tends not to result in positive outcomes.

Extraversion (E). Individuals high on this trait are likely to experience positive emotions, tend to be sociable, warm, cheerful, energetic, assertive and sensitive to rewards (McCrae, 1992; McCrae & Costa, 1987; Rothbart & Bates, 1998). When compared with those lower on extraversion, research has found that those higher in extraversion tend to use higher levels of problem-focused coping (Hooker et al., 1994; McCrae & Costa, 1986). As suggested by Connor-Smith and Flachsbart (2007), extraverts have the energy and optimism required to initiate and maintain coping efforts. Along with an outgoing nature, this can potentially facilitate primary control engagement strategies such as problem solving and seeking support and secondary control engagement strategies such as cognitive restructuring and distraction (Lengua, Sandler, West, Wolchik, & Curran, 1999; Vollrath, 2001). In agreement with this

explanation previous studies have found that individuals high on extraversion tend to use more seeking social support (Amirkhan, Risinger, & Swisckrt, 1995; David & Suls, 1999; Hooker et al., 1994), and positive thinking or reinterpretation (McCrae & Costa, 1986; Watson & Hubbard, 1996). There appear to be few arguments that justify the link between extraversion and engagement coping such as emotion regulation, acceptance or religious coping (Connor-Smith & Flachsbart, 2007). However, as highlighted by the same authors greater use of engagement coping does not imply decreased use of disengagement coping. Individuals high on extraversion are said to be flexible copers who are able to adapt their coping response based on the situation (Lee-Baggley et al., 2005). As suggested by Lazarus and Folkman (1984) being flexible is considered to be an important predictor of coping effectiveness.

Agreeableness (A). High levels of this trait have been previously associated with altruism, acquiescence, trusting and helpfulness (McCrae, 1992; McCrae & Costa, 1987). As suggested by Connor-Smith & Flachsbart (2007) because agreeableness plays a limited role in the stress process, it is less likely that this trait predicts engagement or disengagement coping strategies. However, people high in agreeableness are more likely to cope in ways that engage or protect social relationships such as seeking support (Hooker et al., 1994; O'Brien & DeLongis, 1996) avoiding confrontation (O'Brien & DeLongis, 1996) or disengagement (Watson & Hubbard, 1996) as compared to those lower on agreeableness.

Conscientiousness (C). Those higher on this trait tend to be organized, reliable, hard working, determined, and self-disciplined (McCrae, 1992; McCrae & Costa, 1987). As suggested by Connor-Smith and Flachsbart (2007) conscientiousness should predict primary control engagement strategies such as problem solving and emotion regulation, which are likely to include planning and persistence when facing difficulties, and secondary control engagement strategies such as distraction and cognitive restructuring,

which require changing from negative to positive activities and thoughts. In agreement with this idea, previous studies have found that conscientiousness was associated with the use of more active, problem-focused strategies (Hooker et al., 1994) such as planning, suppression of competing activities, and reappraisal (Watson & Hubbard, 1996). In addition, conscientious individuals are likely to be more able to resist impulses to give up, or vent emotions inappropriately (Connor-Smith & Flachsbart, 2007). In agreement with this assumption previous studies have found that those higher on conscientiousness are less likely to engage in avoidant, or emotion-focused coping strategies such as self blame (Hooker et al., 1994; O'Brien & DeLongis, 1996). Individuals high on conscientiousness have shown to be effective copers who adapt to the situation and respond efficiently (Lee-Baggley et al., 2005; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

Openness to experience (O). Those high on this trait tend to be creative, imaginative, psychologically minded, curious, and flexible in their way of thinking (Costa & McCrae, 1992). According to Connor-Smith and Flachsbart (2007) these characteristics may lead to greater use of problem solving, cognitive restructuring, acceptance, and distraction, which require the ability to consider new perspectives. Previous studies have found partial support for this assumption that those higher on openness to experience are more likely to employ humour in coping (McCrae & Costa, 1986), to think about or plan their coping (Watson & Hubbard, 1996), and to engage in positive reappraisal (O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

It is clear that personality plays an important role in almost every aspect of the stress and coping process. In addition, models of stress and coping process maintain that coping is a result of the interaction between the individuals and the environment (Lazarus & Delongis, 1983). Thus, future studies in this area should clarify the stressor or the context reported in the study (Lee-Baggley et al., 2005) in order to design more

effective interventions and prevention programmes that fit the unique needs of the individual. Additionally, most research has focused on the role of neuroticism and extraversion, resulting in only limited knowledge about the relationship of the other traits and coping. However, as some studies have demonstrated (David & Suls, 1999; Hooker et al., 1994; O'Brien & DeLongis, 1996) all the dimensions add significant understanding of the stress and coping process. In addition, future research should control for perceived severity of the stressor as previous research has demonstrated that perceived severity of the stressor interacts with personality to predict coping strategy use (David & Suls, 1999). Finally, no studies were found to analyze the influence of personality on coping in the sport context, thus it is believed that research in this area will possibly contribute to the design of successful individual interventions in sport.

2.3.3.2. MENTAL TOUGHNESS

Mental toughness appears to be a popular topic receiving attention from an increasing number of researchers around the world (e.g., Clough et al., 2002; Jones et al., 2002; Gucciardi et al., 2009). Although researchers are unanimous in considering mental toughness as one of the most important psychological constructs for successful sport performance (Bull, Shambrook, James, & Brooks, 2005; Clough et al., 2002; Connaughton, Wadey, Hanton, & Jones, 2008; Jones et al., 2007) no consensus exists on how to define mental toughness (Crust, 2007, 2008). In addition, most of the research on mental toughness suggests that one of the key aspects which distinguish a mentally tough from a less mentally tough athlete is their ability to cope with stressful encounters (e.g., Jones et al., 2002). This would suggest that this personality characteristic would have an influence on coping preferences. However, to date little research has been conducted into whether mental toughness influences the experience of stress and the use of coping strategies or their effectiveness.

Based on their qualitative research with a variety of individual and sport team performers using interviews and focus-groups Jones et al. (2002) identified 12 essential attributes of mental toughness. However, this work has a number of important limitations (Crust, 2008; Gucciardi et al., 2009). For example, they used only a small homogenous sample and the results were largely descriptive and failed to draw on established theory. In an extension of their earlier research Jones et al. (2007) aimed to develop a framework of mental toughness by identifying the key underpinning attributes in a wide range of sports. They interviewed eight Olympic or world champions as well as three coaches and four sport psychologists who have worked with these athletes. Based on an inductive thematic analysis of the data, this time 30 key attributes were defined as central to a framework of mental toughness, which were partially similar to their previous work (Jones et al., 2002). These attributes were categorized into 13 sub-components, and four dimensions: attitude/mindset, training, competition, and post competition. As suggested by Gucciardi et al. (2009), this framework provides a comprehensive description of what aspects of mental toughness may be required in a specific context. However, this work has also some important limitations which restrict its generalisability. For example, no comparisons were made with less tough or less successful athletes. Hence, the authors equate toughness with objective success (in terms of placement in events) in sport. However, using objective success as the only determinant has significant limitations. Hence, an athlete can qualify for a final and produce a personal best but not win the event. Also, sport is determined by physical attributes which are not always under the control of the athlete (height, muscle fibre distribution). Finally, this research does not identify the process by which key attributes enable one to be mentally tough in specific contexts (Gucciardi et al., 2009).

Other researchers, also using a qualitative approach in the sport setting, have investigated perceptions of mental toughness in specific sports such as cricket (Bull et

al., 2005) and soccer (Thelwell, Weston, & Greenlees, 2005). These studies found similar results to those by Jones et al. (2002) with a strong emphasis placed on coping effectiveness (Thelwell et al., 2005) and tough thinking such as being able to think clearly, and having a robust self confidence (Bull et al., 2005). Nevertheless, caution should be drawn when reaching conclusions in the area of mental toughness based on the results of these studies. As suggested by Gucciardi et al. (2009) the descriptive presentation of these findings has limited theoretical impact and their sample sizes make it difficult to generalize this to other populations.

Gucciardi et al. (2009) proposed a theoretical model to guide future research in mental toughness. This model is based on their qualitative research with Australian football coaches, which was developed within a personal construct psychology (PCP) framework. The authors created a grounded theory of mental toughness which highlights the interaction of three components (characteristics, situations, and behaviours) as central to a conceptualization of mental toughness in Australian football. As defined by the authors: "mental toughness is a collection of experimentally developed and inherent sport-specific and sport-general values, attitudes, emotions, and cognitions that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressures, challenges, and adversities to consistently achieve his or her goals" (p. 67). The researchers propose the use of this conceptual model to analyze mental toughness, arguing that previous research has significant limitations because it has focused on the successful outcomes of mental toughness (Jones et al., 2002, 2007; Thelwell et al., 2005) rather than the processes by which mental toughness enabled one to achieve and maintain success. However, it is suggested that little evidence has emerged to support this model, possibly due to the lack of valid and reliable instruments available to investigate the functions of the key mental toughness constructs within the cycle of experience. In addition, the little

research conducted in this area used Australian football coaches, providing limited generalization of findings to other populations in sport. In this way, little is known about the contribution of this model to the definition of the mental toughness construct.

It is clear from the above, that previous studies contributed to a better understanding of key characteristics of mental toughness based on exploratory research, however little is known about the relationship between these findings and psychological theory. In opposition to previous research the work by Clough et al. (2002) proposes a theoretical approach of mental toughness grounded in the foundations of existing psychological theory. These researchers conceptualized mental toughness as a trait construct which shares similarities with hardiness (Kobassa, 1979). Hardiness has been characterized by three main components: *control* of various life situations; *commitment,* one tends to involve him/herself in the action undertaken; and *challenge*, the ability to accept that change is normal. Based on their qualitative studies with athletes Clough et al. categorized most of the factors identified as necessary for one to be mentally tough into Kobasa's hardiness model. However, some elements did not apply to any of the three hardiness categories. In this way Clough et al. extended the work of Kobassa, and added a fourth category: *confidence*. This addition is consistent with the extant literature on mental toughness which suggests that self-confidence and the belief in one's ability is considered the most important characteristic of mental toughness in sport (e.g., Gucciardi et al., 2009; Jones et al., 2007). As such Clough et al. created the 4Cs model of mental toughness: control, commitment, challenge and confidence. These researchers developed the following definition of mental toughness based on their ecological research with athletes, coaches, and sport psychologists and the theoretical framework of Kobasa: "Mentally tough individuals tend to be sociable and outgoing: as they are able to remain calm and relaxed, they are competitive in many situations and have lower anxiety levels than others. With a high sense of self belief and an unshakeable faith that

they control their own destiny, these individuals can remain relatively unaffected by competition or adversity" (p.38).

Clough and colleagues (Clough et al., 2002; Crust & Clough, 2005; Levy, Polman, Clough, Marchant, & Earle, 2006) have used their mental toughness Questionaire 48 (MTQ48; Clough et al., 2002) to assess an individual's total mental toughness and the four sub-components: control (emotional and life), commitment, challenge and confidence (interpersonal and abilities) (see section 2.3.3.2.1.for details).

As suggested by Crust (2008) the work of Jones et al. (2002, 2007) and Clough et al. (2002) provides a starting point from which future researchers could begin to empirically examine and understand mental toughness. It is clear that some similarities exist in the work by Jones et al. and Clough et al. in particular control and confidence are considered essential constructs in defining mental toughness. Furthermore, coping appears to be a key construct of mental toughness (Jones et al., 2002, 2007; Thelwell et al., 2005), however little is known about the relationship between coping and mental toughness. In one of the few studies investigating the relationship between mental toughness and coping among athletes, Nicholls et al. (2008) found that higher levels of mental toughness were associated with strategies that would be classified as problem-focused coping strategies and less use of avoidance coping strategies. These findings are similar to previous research conducted by Koshaba and Maddi (1999). They found that hardy people are more likely to use problem-focused coping behaviours when faced with a stressful situation.

Based on previous findings on mental toughness and theory a number of predictions can be made between mental toughness and the stress coping process. For example, mentally tough athletes are more likely to cope more effectively than less mentally tough athletes (Bull et al., 2005; Jones et al., 2002; Thelwell et al., 2005). However, to date no study has investigated this proposition. In addition, it is unclear

whether increased coping effectiveness is the result of a more mentally tough individual using different coping strategies or using the same strategies more effectively. Based on the conceptualization of mental toughness it would be predicted that mental toughness is associated with the use of problem-focused coping strategies and less avoidance coping strategies. Hence, a mentally tough athlete would be expected to face a stressor rather than ignore or avoid the situation. Mental toughness, in this respect, has been associated with higher levels of optimism (Bull, Albinson, & Shambrook,1996; Gould, Dienffenbach, & Moffet, 2002). As suggested in a recent meta-analysis by Solberg Nes and Segestrom (2006) higher levels of optimism are related to the use of more problem-focused coping and less use of avoidance strategies. Furthermore, as suggested by previous research (Jones et al., 2002; Thelwell et al., 2005) mentally tough athletes are likely to be more focused, confident and more in control under pressure. Nicholls et al. (2008) found that confidence in one's ability is positively associated with more task orientated coping and negatively associated with distraction and disengagement coping. Additionally, as shown by Anshel (1996), and Anshel and Kassidis (1997) high levels of controllability are linked to problem-focused coping. Furthermore, it has been suggested that problem-focused coping will be more effective during events in which the athlete has the potential for personal control, whereas emotion-focused coping has been proposed as being more effective during encounters in which the athlete has very little control. This is known as the goodness-of-fit model (Folkman, 1991, 1992). According to this model 'the effectiveness of different coping strategies will vary as a function of the extent to which the event is appraised to be controllable' (Conway & Terry, 1992, p. 1). Finally, mental toughness is likely to have an influence on the appraisal process. For example, it might well be that more mentally tough individuals experience fewer stressors and appraise these stressors with lower levels of stress intensity and higher levels of control. However, further research is required to explore

the relationship between mental toughness and stress and coping in the context of sport. This is important, from both a theoretical and a practical perspective. For example, this can provide a possible portal to help athletes to deal better with stress and enhance performance and satisfaction.

2.3.3.2.1. MTQ48

Several studies have been conducted to assess the validity of the MTQ48. Content validity has been determined by examining the literature, athlete's perceptions and results of intervention studies. In addition, the MTQ48 has also been shown to have good construct validity. For example, total mental toughness relates to a number of other related constructs (see Nicholls et al., 2008; Clough et al., 2002; Crust & Clough, 2005) including optimism ($r = .48$, $p < .01$ and $r = .56$, $p < .01$), pessimism ($r = -.46$, $p < .01$), self-image ($r = .42$, $p < .05$), life satisfaction ($r = .56$, $p < .01$), self-efficacy ($r = .68$, $p < .01$), and stability ($r = .57$, $p < .01$). All the correlations are small enough to suggest that the MTQ48 has some commonality with these psychological constructs but that it is an independent construct in its own right. Furthermore, the criterion-related validity of the MTQ48 has been shown to be satisfactory. A study on the effects of physical workload on mental fatigue and performance on a cognitive task showed that as the workload increased (to 70% of VO2max) there was a significant difference in the perceived physical demands of the high and low mental toughness groups. This suggests that as the physical demands increase the more mentally tough group are more likely to continue exercise than the less mentally tough group. In a second study the effect of negative and positive feedback on performance of a motor task was investigated among 79 participants. Results showed that there was a significant interaction between mental toughness and feedback. In particular, the performance of the more mentally tough remained consistent with positive and negative feedback, whereas the less mentally

tough scored less well after negative feedback (Clough et al.). Finally Clough et al. investigated the fairness of the MTQ48, and they found that although it differentiates between elite, regional, and recreational athletes, it does not discriminate across gender. However, a more recent study by Nicholls, Polman, Levy, and Backhouse (2009) did not find that the MT48 could discriminate athletes by skill level. However, the male athletes scored higher on a number of subscales and total MT in comparison to the female athletes. The MTQ48 has been completed by more than 600 athletes from a range of sports and it has been found to have good reliability (Cronbach's alpha for total MT = .90). Previous research has shown that athletes are willing to complete it (face validity), with an average completion time of less than 15 minutes (Clough et al., 2002).

Recent research has provided support for the psychometric properties of the MTQ48 (Horsburg, Schermer, Vesekla, & Vernon, 2009). In addition, a number of studies have provided support for the predictive, face, construct, and criterion validity of the MTQ48 (Clough et al., 2002; Crust & Clough, 2005; Levy et al., 2006; Nicholls, Polman, Levy, & Backhouse, 2008). Finally, in their twin study, Horsburgh et al. (2009) found that the scales on the MTQ48 were significantly correlated with the Big Five factors of personality (i.e., neuroticism was negatively correlated with all the nine mental toughness variables, and extraversion, agreeableness, openness to experience, and conscientiousness were positively correlated with the nine mental toughness variables), and that differences in mental toughness were the result of both genetic and non-shared environmental factors. This provides additional support for Clough et al.'s hypothesis that mental toughness can be considered a personality trait.

In conclusion, the MTQ48 measure of mental toughness appears to be an accurate, fair, and useful way of evaluating this key concept in sport psychology (Clough et al., 2002).

2.3.4. Overview of the studies

Based on the review of the literature provided, so far in the current thesis, it is clear that further research is required examining gender and personality as moderators of coping preferences in sport. In this way, the following chapters aim to culminate this gap in the literature, and contribute to further knowledge in this area. Study 1 is a cross sectional study comparing the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping in a sample of soccer athletes. Study 2 also compares the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping using an experimental design, and a sample of male and female participants required to perform a complex motor skill (golf putting task) under a normal control and an experimental stress condition.

Studies 3 and 4 are cross sectional studies investigating the relationship between personality (the Big Five and the sport specific personality trait mental toughness) and stressor type, stressor appraisal, coping, and coping effectiveness.

Finally, the last chapter of this thesis aims to summarize the findings of these studies, and provides a discussion of how the findings contribute towards understanding the theory in the field of coping in sport. Furthermore, possible limitations, recommendations and practical implications of this research programme will be discussed.

CHAPTER 3: STUDY 1

Gender differences in Coping: An Examination of the Situational and Dispositional Hypotheses

3.1. Abstract

This study investigated the utility of the situational and dispositional hypothesis in determining coping preferences among British male and female soccer players. Two hundred and eighty one British soccer players (147 males; 134 females) were asked to rate the levels of stress intensity and perceived control in three experimenter determined stress scenarios and completed the MCOPE for each situation. Results revealed gender differences in the appraisal of the three scenarios. Also, gender main effects pointed towards differences in coping between genders. However, no interaction effects were observed between gender x stress intensity x perceptions of control as independent variables, and the 12 subscales of the MCOPE as dependent variable. The absence of interaction effects suggests that when male and female soccer players perceive similar levels of stress intensity and control over an acute stressor, they exhibit similar coping responses, thus providing support for the situational hypothesis. The dispositional hypothesis, on the other hand, could be a viable explanation for gender differences in the appraisal process, but not coping.

3.2. Introduction

A situation that taxes or exceeds an individual's resources and endangers their well-being has the potential to evoke a stressful response (Lazarus & Folkman, 1984). In competitive sport, examples of stressors among athletes include making a mental or physical error, suffering pain or injuries, observing an opponent cheat, receiving a wrong call from the referee, performing poorly due to bad weather or substandard playing conditions, and being distracted by the crowd (e.g., Anshel et al., 2001a; Nicholls, Holt, Polman, & Bloomfield, 2006). It is essential that athletes develop and use appropriate coping mechanisms to face these stressors to enable them to perform to the best of their ability and feel satisfied with their experience (Crocker, Alderman, & Smith, 1988).

As defined previously in this thesis (see section 2.2. for a theoretical explanation of coping/transactional model) coping is "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984; p. 141).

In recent reviews Hoar et al. (2006), and Nicholls and Polman (2007a) suggested that when faced with a stressor male and female athletes might utilize different coping strategies. Gender differences in coping preferences have both applied and theoretical implications (Crocker et al., 1998). Although Sorenson (1993) has suggested that gender is an important factor in stress and coping, to date results on gender differences in coping preferences in general and sport in particular have been equivocal. Tamres et al. (2002) have provided support for the notion that males and females differ in coping preferences in their meta-analysis of 50 studies (of which only 4 were sport related). In particular, females were found to use the following emotion focused coping strategies

more frequently than males: seeking support for emotional reasons (r = -.20, p <.001) rumination (r = -.19, p < .001), and positive self-talk (r = -.17, p = .001). When comparing gender differences in coping with different types of stressors the effect size for 'achievement situations' remained moderate for seeking support for emotional reasons (r = -.16, p < .001) and positive self-talk (r = -.16, p < .001), but was low for rumination (r = -.07, p < .05).

However, research concerning gender and coping differences in the sport domain has been less clear. For example Yoo (2001), with a sample of competitive athletes from different sports, and Hammermeister and Burton (2004), using a sample of endurance athletes, reported gender differences in coping with competitive stressors. In particular, Hammermeister and Burton (2004) found, when asking endurance athletes to describe what coping strategies they expected to use leading up to and during an endurance competition, that female endurance athletes anticipated the use of more emotion-focused strategies such as positive reinterpretation, emotional social support, dissociation, and venting of emotions, whereas males anticipated the use of suppression of competing activities and association. Additionally, males reported lower use of instrumental social support than females. In congruence with these findings, Yoo (2001), when asking athletes from a large number of individual and team sports what they generally did when experiencing a stressful event in their athletic life, found that males reported higher problem-focused coping than females. Conversely, females reported higher transcendent and emotion-focused coping scores than males. However, Bebetsos and Antoniou (2003), and Kowalski et al. (2005), did not find gender differences in coping in a sample of badminton players who completed the Greek version of the Athletic Coping Skills Inventory-28 and a sample of adolescent athletes from various sports recalling the most stressful situation in their specific sport in the

previous 12 months and completing the Coping Function Questionnaire (Kowalski & Crocker, 2001) respectively.

As discussed previously in this thesis two contrasting theories have attempted to explain observed gender differences in coping preferences: the dispositional hypothesis, and the situational hypothesis/role constraint theory (see section 2.3.1. for a theoretical explanation of the theories). According to the situational hypothesis, differences in coping preferences among males and females are the result of the different roles males and females occupy in society and the different stressors they encounter. The dispositional theory, therefore, would predict that gender differences in coping will be found across situations and social roles whereas the situational hypothesis/role constraint theory predicts that gender differences will disappear when males and females face the same stressor and take on similar social roles (Sigmon et al., 1995). This would suggest that studies which adopt the self-selected paradigm (e.g., participants choosing their own specific acute stressful event) are confounded by the source of stressor. Or as Hammermeister and Burton (2004) noted, previous research in coping in sport has been limited by the inability of the researchers to identify a common stressor for all athletes.

Research that has examined gender differences in stress and coping in sport is plagued by problems (see section 2.3.2. for a review). In addition, most of the research to date has been a-theoretical in nature. The exploration of gender differences has not been the primary focus or posteriori findings rather than explicit aims of studies (Ptacek et al., 1994a). This has resulted in methodological problems, including lack of assessment of situational factors (stressor appraisal) in terms of stressor intensity and perceived control over the stressor, the sources of stress, and the heterogeneity of samples (Billings & Moos, 1984; Folkman & Lazarus, 1980).

As mentioned previously, primary appraisal reflects the degree to which an event is perceived to be stressful. The individual appraisal of the nature of the demands of the stressful event is more important than the objective characteristics of the event (Lazarus & Folkman, 1984). If males and females appraise stressful situations differently, this could explain possible gender differences in coping preferences. Hence, higher levels of stress are likely to elicit emotional distress which will require the use of tension reducing coping strategies (Anderson, 1977; Lazarus & Folkman, 1984; Terry, 1991). The meta-analysis by Tamres et al. (2002) found that 26 out of the 50 studies assessed stressor appraisal. Of these studies, 17 showed that females appraised a specific stressor as more severe than males whereas the other nine studies did not show gender differences. In addition, they showed that females used only more coping strategies in studies in which they reported higher levels of stress intensity suggesting that previous findings in gender differences in coping preferences may be caused by stressor appraisal differences between males and females.

Secondary appraisal considers options for dealing with the stressful event (see section 2.1. for more detail). Beliefs about controllability were selected in the present study because there is consistent evidence that event control beliefs influence situational coping preferences. For example, problem-focused coping strategies are preferred in situations appraised to be controllable (Aldwin, 1991; Carver et al., 1989; Folkman & Lazarus, 1980). Such situations allow individuals to believe that efforts aimed at managing the stressor will not be in vain (Pearlin & Schooler, 1978). On the other hand, perceptions of low controllability increase emotional distress and would require emotion-focused coping strategies (Aldwin, 1991; Folkman & Lazarus, 1980). Although perceptions of control appear to be an important variable when exploring gender differences in coping preferences this has not featured prominently in the sport psychology literature. Hammermeister and Burton (2004) found that female endurance

athletes perceived less control over a stressful situation (the upcoming competition) and used predominantly emotion-focused strategies while males perceived higher control over the situation and used more problem-focused coping. On the other hand, Kowalski et al. (2005) in their study with adolescent sport participants, found that perceived stress was an important predictor of emotion-focused coping beyond control beliefs, whereas problem-focused coping was related to control over the situation.

The assessment of control has been controversial (Skinner, 1996; Thoits, 1991, see section 2.1 for more detail). In the present study subjective behavioural control was retrospectively measured over a specific event (a harm/loss scenario) without reference to the specific means of accomplishing control (Skinner, Chapman, & Baltes, 1988; Weisz, 1986). That is, the study did not assess self-efficacy beliefs (agent-means beliefs) that one is capable of producing the required response.

As stated previously (see section 2.3.2.6.2. for more detail), without a common stressor it is difficult to ascertain whether gender differences in coping preferences are the result of gender differences or the type of stressor reported (Ptacek et al., 1992). In the study by Kolt, Kirkby, and Lindner (1995) with competitive gymnasts, gender differences in coping preferences were observed. However, in this study the stressor was experimenter defined as 'experience a slump in performance.' It is likely that each athlete will refer to their personal experience in response to this non-specific and broad formulation of a stressor. Additionally, the situational aspects of the stressor in terms of intensity and controllability were not considered. The observed coping gender differences in this study might have been due to different interpretation of the stressor (slump being considered in terms of different type of specific stressors) or to differences in its appraisal. The limitations of this study are similar to a study by Crocker and Graham (1995) with competitive athletes. The authors found support for the dispositional hypothesis, however athletes were asked to 'recall a stressor they had

experienced in which they had performance difficulties or felt under pressure.' Again, differences in source of stress and its appraisal might have accounted for the differences in coping preferences observed between the male and female athletes in this study. Finally, in a cross sectional study by Anshel et al. (1997) gender differences in coping preferences were found among U.S and Australian athletes from different sports. Seven stressors were experimenter defined in this study and gender differences observed might have been the result of the appraisal of these stressors.

Most research in the area of gender differences in stress and coping in sport have used heterogeneous samples (Anshel et al., 2001a; Anshel et al., 2001b; Anshel et al., 1998; Anshel & Sutarso, 2007; Crocker & Graham, 1995; Kowalski et al., 2005; Qiwei & Anshel, 2006; Yoo, 2001). Sources of stress in such studies are confounded by the nature of the sport athletes participate in (Anshel & Delany, 2001). Differences in coping found in some of these studies may be due to differences in sport type, and stressors experienced rather than differences in relation to gender. Nicholls et al. (2007), using concept maps (Novak & Gowin, 1984), found that individual sport athletes used more emotion-focused coping techniques (e.g., relaxation, self-blame, and visualization), whereas team sport athletes used more communication as a coping strategy. The current study, therefore, used a homogenous group of athletes (soccer players) who experience similar sport specific stressors.

The present study will address some of the limitations of the previous research on gender differences in stress and coping in sport, a common stressor (harm/loss scenario) will be defined to all the athletes and situational appraisal (stress intensity/control perceived) and coping preferences will be assessed in each situation. Due to the equivocal findings and methodological limitations of previous research on gender and coping in sport no directional hypothesis are provided in the present study with regard to differences in coping preferences (either at the strategy or dimensional

level) between male and female athletes. However, the present study compared the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping in sport. The situational hypothesis or role constraint theory would predict that if soccer players experience the same stressors (experimenter defined) and have similar situational appraisal of these stressors in terms of intensity and controllability then no gender differences in coping preferences should emerge. The dispositional hypothesis, on the other hand, would predict different coping preferences reported by males and females across different situations, influenced by biological and social gender differences.

3.3. Method

3.3.1. Participants

Participants were 281 British soccer players (147 male; 134 female) aged between 16 and 41 years. The mean age of the participants was 20.6 years (*SD* = 3.76). Participants in this study were mainly amateur soccer players from university and county clubs around East Yorkshire and North Yorkshire. Participants gave informed consent prior to study participation. The study was approved by a University's Research Ethics Committee.

3.3.2. Measures

Coping was assessed at the strategy level by using the modified COPE (MCOPE; Crocker & Graham, 1995). The MCOPE asks participants to indicate how much they use a particular coping strategy during a stressful event and has 12 coping factors each consisting of four items. Five of the coping factors can be classified as problem-focused coping strategies (active coping, seeking social support for instrumental reasons, planning, suppression of competing activities, increasing effort), five as emotion-focused coping strategies (seeking social support for emotional reasons,

humour, venting of emotion, self-blame, wishful thinking) and two as avoidance coping strategies (denial, behavioural disengagement). Each item is scored on a five-point scale starting with to use '*not at all/ very little'* (1) to use '*very much'* (5). The score for each subscale is calculated by adding the scores of the questions related to the scale divided by the number of items. There is extensive evidence supporting the reliability of the MCOPE scales (e.g., Crocker & Isaak, 1997).

A horizontal visual analogue scale was used to assess each participant's level of stress intensity and control over the stressor. Participants were asked to rate each item by dissection of a 10 cm bipolar line anchored by two statements ('*not at all stressful'* vs. *'extremely stressful'* and *'no control at all'* versus *'full control'*). The 'stress thermometer' has already demonstrated normal distribution properties and adequate variability for male and female athletes (Kowalski & Crocker, 2001). The assessment of control has been controversial (Thoits, 1991). In the present study control was measured over an event without reference to the specific means of accomplishing control (Skinner et al., 1988; Weisz, 1986). Previous studies which have adopted such an approach to assess perceptions of control have used one item questions requiring a response on a Likert-type scale (e.g., Compas, Malcarne, & Fondacaro, 1988; Folkman & Lazarus, 1980; Gamble, 1994). An advantage of using analogue scales is that participants are not assigned to a certain response allowing for a greater variability in the data obtained.

3.3.3. Procedure

In a pilot study male and female soccer players were asked to list, in the order of importance, the three most important stressors they experienced during a match. Following this, the three most reported stressors were formulated and presented to a panel of five expert soccer players and coaches to see if these were valid and well formulated stressors commonly experienced by male and female soccer players. Following feedback the following stressors were used: physical error "*you made a*

technical error which resulted in the loss of the ball"; wrong call from the referee "*receiving an unfair call from the referee when no foul or offence was committed*"; and observing an opponent cheat "*during a game your opponents' play was physically outside the laws of the game. They continuously kick and push you even when the ball is not around*."

A questionnaire pack (see Appendix A) was administered by the researcher after a training session with permission of the coach. Completion time was approximately 15-20 minutes. The questionnaire pack included a demographic questionnaire, followed by a brief text requiring the athletes to recall the last competition event experienced in that week. After this, the first scenario situation was described. In order to make sure that the participant experienced the situation previously it was asked: "*have you experienced the above situation*", if the answer was "yes" two visual analogue scales relating to stressor intensity and control were completed. Finally, the MCOPE was completed for that scenario. This procedure was repeated for the other two scenarios.

3.3.4. Data Analysis

Means, standard deviations, and internal consistency were calculated prior to statistical analysis. To assess the homogeneity of the sample an independent t-test was first conducted to explore whether the male and female soccer players differed in age and years of experience. Secondly, it was explored whether these variables influenced coping preferences by means of hierarchical linear regression analysis. Age and years of experience acted as the independent variables. At step one gender was entered and at step two years of experience and age were entered and the 12 subscales of the MCOPE were the dependent variables.

One way analysis of variance (ANOVA) was conducted to assess whether the soccer players appraised the three scenarios differently in terms of stress intensity and perceived control. In the instance of a significant difference post-hoc comparisons using

Fisher LSD were conducted. Independent t-test established if there were gender differences in the appraisal of the situational measures stress intensity and perceived control for each scenario.

To differentiate the levels of stress reported the soccer players were categorized as low, medium, or high in stress intensity and perceived control using a three way percentile split. Multivariate analysis of variance (MANOVA) were conducted for each scenario with gender (male, female), stress intensity (low, medium, high), and perceived control (low, medium, high) as the independent factors. The 12 subscales of the MCOPE were the dependent variables. Follow-up univariate analysis of variance (ANOVA) was executed in the instance of a significant main or interaction effect. Fisher LSD test for *a posteriori* comparisons determined the exact location of the differences. Of particular interest are the possible moderating effects of the situational factors on the coping preferences of the male and female soccer players. Given that the independent variable (gender) and the moderating variables or situational appraisal factors (stress intensity and perceived control) are categorical, Barron and Kenny (1986) stipulated that a significant interaction effect produced via an ANOVA is a suitable indicator of moderation. Such an approach would be particularly suitable because of the inconsistent relationship obtained in previous research between gender and coping preferences (Barron & Kenny, 1986). Multivariate normality was assessed using Mahalanobis distances and Cook's distances and homogeneity of the data set was assessed using Levene's test and the Box's M statistic (see Appendix E).

3.4. Results

Table 2 provides the means and standard deviations for the situational factors (stress intensity and perceived control) and the coping subscales of the MCOPE for the

male and female soccer players separately for each of the three scenarios. Most of the factors of the MCOPE achieved suitable reliability (see Table 2).

Table 2: Means and standard deviations for the situational factors and the subscales of the MCOPE for the male and female soccer players separately.

Also included are the Cronbach's alphas of the three scenarios for each coping strategy of the MCOPE.

	Scenario 1					**Scenario 2**					**Scenario 3**				
	Males		**Females**			**Males**		**Females**			**Males**		**Females**		
	M	***SD***	***M***	***SD***	***α***	***M***	***SD***	***M***	***SD***	***α***	***M***	***SD***	***M***	***SD***	***α***
Stress Intensity	5.20	2.44	5.90	2.28		6.19	2.80	6.63	2.44		6.32	2.45	6.80	2.35	
Control	6.01	2.47	5.16	2.47		4.67	2.97	3.80	2.86		5.07	2.65	4.65	2.69	
Active Coping	3.35	.75	3.51	.68	.64	2.98	.78	3.37	.71	.67	3.15	.77	3.42	.72	.65
Seeking Instrumental Social Support	2.46	.83	2.84	.94	.50	2.31	.76	2.75	.93	.60	2.40	.82	2.94	.95	.77
Planning	3.00	.85	3.09	.84	.70	2.74	.84	2.93	.75	.66	2.91	.83	3.10	.79	.72
Seeking Emotional Social Support	2.41	.87	2.80	.93	.74	2.44	.79	3.05	.96	.78	2.52	.82	3.03	.96	.79
Denial	2.34	.79	2.50	.88	.63	2.42	.86	2.54	.89	.71	2.47	.90	2.62	.83	.69
Humour	2.19	.98	2.44	.99	.81	2.19	.98	2.44	.99	.80	2.30	.93	2.34	.97	.82
Behavioural Disengagement	1.84	.84	1.95	.82	.72	2.17	.90	2.17	.90	.76	2.21	.87	2.16	.86	.75
Venting Emotions	2.40	.91	2.62	.95	.76	2.70	.88	2.87	.93	.75	2.63	.92	2.81	.95	.79
Suppression Competing Activities	2.95	.79	3.00	.87	.70	2.78	.80	2.93	.85	.71	2.82	.84	2.98	.80	.73
Self-Blame	3.23	.87	3.42	.81	.68	2.63	.80	2.92	.77	.59	2.59	.85	2.73	.84	.68
Wishful Thinking	2.70	.84	3.19	.97	.68	2.59	.86	2.93	.97	.74	2.54	.86	2.87	.99	.78
Increasing Effort	3.89	.84	4.10	.71	.74	3.31	.93	3.62	.87	.78	3.49	.91	3.71	.91	.77

A significant difference was found for age (t_{278}= 1.94; p = .05) and for years of experience (t_{278} = 7.19; p< .001). The males were slightly older (M = 21.02, SD = 4.27) than the females (M = 20.25, SD = 3.07) and had more experience (M = 13.53, SD = 4.18 vs. M = 9.80, SD = 4.59).

Table 3 provides the results for the hierarchical linear regression analysis for years of experience and age whilst controlling for gender for the 12 subscales of the MCOPE for each scenario. Years of experience added significant additional variance for venting of emotions in scenario one and active coping and suppressing of competing activities for scenario two and three. Age added significant additional variance for planning, seeking emotional social support, behavioural disengagement, and wishful thinking in scenario one. For scenario two age was a predictor for planning, denial, self-blame and wishful thinking. Finally, for scenario three seeking informational social support, denial, behavioural disengagement and wishful thinking were significant predictors. Only wishful thinking was a strategy reported to be used more frequently for all three scenarios. Also, the Betas for the significant contributions were all positive. This indicates that with increasing age or increasing experience the football players are more likely to use these coping strategies.

Table 3: Results of the hierarchical linear regression analysis for gender and years of experience and the 12 subscales of the MCOPE for each scenario.

Step and variable	B	Beta	R^2	ΔR^2
1st Scenario				
Active Coping				
Step 1: Gender	.19	.13	.02	
Step 2: Age,	.00	-.02	.03	.01
Years of experience	.02	.12		
Seeking Instrumental Social Support				
Step 1: Gender	.40**	.23	.05	
Step 2: Age,	.03*	.14	.08	.03
Years of experience	.01	.05		
Planning				
Step 1: Gender	.15	.09	.01	
Step 2: Age,	.04*	.16	.05	.04*
Years of experience	.01	.06		
Seeking Emotional Social Support				
Step 1: Gender	.43**	.24	.06**	
Step 2: Age	.04*	.18	.10	.04**
Years of experience	.01	.04		
Denial				
Step 1: Gender	.01	.01	.00	
Step 2: Age,	.02	.13	.06	.01
Years of experience	.00	-.03		
Humour				
Step 1: Gender	.28*	.15	.02	
Step 2: Age,	.01	.05	.02	.00
Years of experience	-.01	-.04		
Behavioural Disengagement				
Step 1: Gender	.17	.10	.01	
Step 2: Age,	.05*	.20	.05	.04
Years of experience	.00	-.01		
Venting Emotions				
Step 1: Gender	.22	.12	.01	
Step 2: Age,	.01	.02	.04	.03
Years of experience	.03*	.16		
Suppression Competing Activities				
Step 1: Gender	.07	.04	.00	
Step 2: Age,	.03	.14	.02	.02
Years of experience	.00	.01		
Self-Blame				
Step 1: Gender	.25*	.15	.02	
Step 2: Age,	-.03	-.12	.04	.02
Years of experience	.03	.19		
Wishful Thinking				
Step 1: Gender	.52**	.29	.06	
Step 2: Age,	.04*	.16	.12	.04
Years of experience	.01	.06		
Increasing Effort				

Step 1: Gender	.22*	.13	.02	
Step 2: Age,	-.01	-.04	.02	.00
Years of experience	.02	.08		
2nd Scenario				
Active Coping				
Step 1: Gender	.41 **	.27	.07	
Step 2: Age,	.01	.07	.11	.04
Years of experience	.03*	.15		
Seeking Instrumental Social Support				
Step 1: Gender	.40 **	.24	.06	
Step 2: Age,	.04*	.22	.11	.05
Years of experience	.00	.02		
Planning				
Step 1: Gender	.12	.07	.01	
Step 2: Age,	.06*	.25	.07	.06
Years of experience	.02	.08		
Seeking Emotional Social Support				
Step 1: Gender	.56**	.10	.10	
Step 2: Age,	.04*	.02	.14	.05
Years of experience	.01	.06		
Denial				
Step 1: Gender	.07	.04	.00	
Step 2: Age,	.05**	.22	.05	.05
Years of experience	.00	.01		
Humour				
Step 1: Gender	.10	.06	.00	
Step 2: Age,	.02	.09	.02	.01
Years of experience	.01	.04	.02	
Behavioural Disengagement				
Step 1: Gender	.04	.02	.00	
Step 2: Age,	.03	.11	.02	.02
Years of experience	.00	.02		
Venting Emotions				
Step 1: Gender	.16	.11	.01	
Step 2: Age,	.01	.05	.05	.02
Years of experience	.03	.19		
Suppression Competing Activities				
Step 1: Gender	.16	.11	.01	
Step 2: Age,	.01	.05	.05	.04
Years of experience	.03*	.19		
Self-Blame				
Step 1: Gender	.23*	.09	.02	
Step 2: Age,	.04*	.02	.05	.03
Years of experience	.01	.01		
Wishful Thinking				
Step 1: Gender	.35*	.19	.04	
Step 2: Age,	.05*	.21	.07	.04
Years of experience	-.01	-.05		
Increasing Effort				
Step 1: Gender	.33**	.17	.03	
Step 2: Age,	.03	.10	.04	.01
Years of experience	.00	.02		

3rd Scenario				
Active Coping				
Step 1: Gender	.29*	.18	.03	
Step 2: Age,	.02	.10	.10	.07
Years of experience	.03*	.20		
Seeking Instrumental Social Support				
Step 1: Gender	.52**	.29	.09	
Step 2: Age,	.04*	.16	.11	.03
Years of experience	.00	.03		
Planning				
Step 1: Gender	.17	.10	.01	
Step 2: Age,	.03	.13	.05	.05
Years of experience	.02	.12		
Seeking Emotional Social Support				
Step 1: Gender	.48**	.26	.07	
Step 2: Age,	.02	.08	.09	.02
Years of experience	.02	.09		
Denial				
Step 1: Gender	.04	.02	.00	
Step 2: Age,	.05*	.20	.06	.06
Years of experience	.01	.06		
Humour				
Step 1: Gender	.06	.03	.00	
Step 2: Age,	.03	.11	.01	.01
Years of experience	-.01	-.03		
Behavioural Disengagement				
Step 1: Gender	.01	.00	.00	
Step 2: Age,	.04*	.17	.02	.02
Years of experience	-.01	-.07		
Venting Emotions				
Step 1: Gender	.15	.08	.01	
Step 2: Age,	.00	.01	.02	.01
Years of experience	.02	.02		
Suppression Competing Activities				
Step 1: Gender	.17	.10	.01	
Step 2: Age,	.01	.07	.06	.05
Years of experience	.03*	.19	.06	
Self-Blame				
Step 1: Gender	.15	.08	.01	
Step 2: Age*	.05	.22	.05	.04
Years of experience	-.01	-.06	.05	
Wishful Thinking				
Step 1: Gender	.36*	.20	.03	
Step 2: Age*	.05*	.22	.08	.04
Years of experience	-.01	-.06		
Increasing Effort				
Step 1: Gender	.24*	.12	.01	
Step 2: Age,	.04	.14	.04	.03
Years of experience	.01	.05	.04	

The participants appraised the scenarios differently in terms of stress intensity ($F_{2,840} = 13.36$, $p < .001$) and perceived control ($F_{2,840} = 17.09$, $p < .001$). Post-hoc

comparisons showed that scenario one (physical error) was perceived as less stressful than scenario two (wrong call from the referee) ($p < .001$) or three (observing an opponent cheat) ($p < .001$). With regards to control, players perceived a higher level of control in scenario one (physical error) in comparison to scenario two (wrong call from the referee) ($p < .001$) and three (observing an opponent cheat) ($p = .001$). In addition, participants reported higher levels of perceived control in scenario three (observing an opponent cheat) than scenario two (wrong call from the referee) ($p = .001$).

Independent t-tests revealed that for scenario one (physical error) ($t_{277} = 2.89$, $p = .004$) and two (wrong call from the referee) ($t_{257} = 2.40$, $p = .017$) the females reported lower levels of control than the males. The t-test was significant for stress intensity in scenario one (physical error) ($t_{277} = -2.46$, $p = .014$) indicating that females had a tendency to rate this scenario as more stressful than the males.

Table 4 provides the results of the MANOVA across the scenarios. Significant main effects for gender with respect to the coping strategies were found in each scenario (scenario one Wilks' $\lambda = .87$, $p < .001$; scenario two Wilks' $\lambda = .80$, $p < .001$; scenario three Wilks' $\lambda = .87$, $p < .001$). No significant interaction was found for gender and stress intensity or for gender and control. The follow-up analysis for the gender main effect for the first scenario (physical error) showed significant differences for seeking instrumental social support ($F_{1,279} = 13.00$, $p < .001$), seeking emotional social support ($F_{1,279} = 12.75$, $p < .001$), humour ($F_{1,279} = 4.51$, $p = .03$), venting of emotions ($F_{1,279} = 4.01$, $p = .04$), wishful thinking ($F_{1,279} = 20.87$, $p < .001$), and increasing effort ($F_{1,279} = 4.06$, $p = .03$). In all instances the female soccer players rated the coping behaviour higher than the male.

The follow-up analysis for the gender main effect for scenario two (wrong call from the referee) revealed significant differences for active coping ($F_{1,279} = 19.17$, $p < .001$), seeking instrumental social support ($F_{1,279} = 18.84$, $p < .001$), seeking emotional

social support ($F_{1,279} = 33.58$, $p < .001$), humour ($F_{1,279} = 4.51$, $p = .03$), self blame ($F_{1,279} = 9.71$, $p = .002$), wishful thinking ($F_{1,279} = 9.25$, $p = .003$) and increasing effort ($F_{1,279} = 8.57$, $p = .004$). Again, females scored significantly higher than the males on each of these sub-scales.

For scenario three (observing an opponent cheat), the follow-up analysis for the gender main effects revealed significant differences for active coping ($F_{1,279} = 8.78$, $p = .003$), seeking instrumental social support ($F_{1,279} = 26.28$, $p < .001$), planning ($F_{1,279} = 4.00$, $p = .04$), seeking emotional social support ($F_{1,279} = 22.32$, $p < .001$), wishful thinking ($F_{1,279} = 8.58$, $p = .004$), and increasing effort ($F_{1,279} = 6.07$, $p = .01$). Again, females scored significantly higher than the males on each of these sub-scales.

Table 4: Relevant MANOVA results for each scenario.

	Scenario 1	**Scenario 2**	**Scenario 3**
Gender main effect	Wilks' $\lambda = .87$, $^{**}p < .001$	Wilks' $\lambda = .80$, $^{**}p < .001$	Wilks' $\lambda = .87$, $^{**}p < .001$
Gender x Stress Intensity	Wilks' $\lambda = .91$, $p > .05$	Wilks' $\lambda = .89$, $p > .05$	Wilks' $\lambda = .92$, $p > .05$
Gender x Control	Wilks' $\lambda = .95$, $p > .05$	Wilks' $\lambda = .86$, $p > .05$	Wilks' $\lambda = .88$, $p > .05$
Gender x Stress x Control	Wilks' $\lambda = .81$, $p > .05$	Wilks' $\lambda = .82$, $p > .05$	Wilks' $\lambda = .77$, $p > .05$

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

3.5. Discussion

The main aim of the present study was to compare the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping preferences in male and female soccer players. The situational hypothesis predicted a rejection of gender differences in coping when situational factors are appraised similarly by males and females. The dispositional hypothesis predicted gender differences in coping across the scenarios, resulting from biological and social differences influencing males and females. The results of the present study showed an absence of significant interactions between gender, stress and control in all three

scenarios suggesting that when male and female soccer players appraised the stressor similarly in terms of stress intensity and perceived control they do not differ in preferred coping strategies. This finding supports the situational hypothesis (Tamres et al., 2002) or role constraint theory (Rosario et al., 1988) explanation of coping preferences in males and females.

Males in the present study were slightly older and had more experience in playing soccer than the females. Suggesting that age and years of experience may influence certain coping strategies, depending on the type of stressor experienced. No further conclusions can be drawn in this area as this goes beyond the main aim of the study. Nevertheless, it is recommended that future research should be conducted in order to understand how age and years of experience influence coping preferences.

The results of our gender main effects are very similar to those obtained by other researchers in both sport and general psychology (e.g., Goyen & Anshel, 1998; Madden, Kirkby, & MacDonald, 1989; Tamres et al., 2002). In particular, the female soccer players in the current study used significantly more emotion (seeking social support) as well as problem (active coping) based coping strategies than the male soccer players. Attention should be drawn to the fact that differences between genders disappeared when the situational factors of stress intensity and perceived control were controlled for. On the other hand, results did show gender differences in the cognitive appraisal of the scenarios in terms of stress intensity and perceived control. Females had a tendency to appraise scenarios one (physical error) and three (observing an opponent cheat) with higher levels of stress intensity compared to males, and appraise scenario one with lower levels of control compared to males. This finding is similar to results reported by Tamres et al. (2002). The authors found that in six of the eight studies which assessed gender differences in achievement situations, females appraised the situation with higher levels of stress intensity. It is suggested that the current study supports Tamres et

al.'s assertion that reported gender differences in coping are more likely the result of differences in the appraisal process rather than in the preference for the use of certain coping strategies. This is supported by the moderator analysis carried out by Tamres et al. When the meta-analysis used stressor appraisal as a moderator, coping preferences were found to be used more often only in studies in which females appraised the stressor as more severe. However, an exception was found for rumination and non-specific support seeking.

From a theoretical perspective, rather than coping preferences being influenced by biological or social factors. It is the appraisal process that influences the selection of coping preferences. It is believed that the dispositional hypothesis could be a viable explanation for gender differences in the appraisal process found in this study, rather than an explanation for gender differences in actual coping strategies deployed. It is suggested that the failure to take into account important situational factors can result in spurious results and premature conclusions. When examining gender differences in coping preferences the appraisal process appears to be an important factor eliminating the moderating effects of gender in the selection of coping strategies. Additionally, the results of this study have found that overall females utilize more coping strategies in absolute terms than males. It is believed that the higher levels of stress intensity and lower levels of perceived control might contribute to this factor. In agreement with this idea, Thoits (1991, 1994) also argued that the differences in appraisal resulted in females using a wider variety of coping preferences.

It is important to highlight the novel contribution of this study to the area of sport psychology, as the assessment of variables which influence the appraisal of stressors and the subsequent coping preferences has been relatively rare. Kowalski et al. (2005) recently examined the effects of perceived stress and control beliefs on coping among adolescent athletes. The authors found support for the notion that control beliefs

are associated with problem-focused coping whereas stress intensity is associated with emotion-focused coping for both adolescent males and females.

The study by Hammermeister and Burton (2004) was one of the first sport related studies that assessed both appraisal and coping. In particular, participants were asked to rate perceived threat and control over their competitive endurance goals. Surprisingly, these researchers did not test the possible effects of situational factors on the coping strategies used by the endurance athletes and they came to the premature conclusion that their results supported the dispositional hypothesis.

The present study has addressed past limitations in the literature and controlled for situational factors such as stress intensity and perceived control influencing coping preferences. In agreement with this idea a non-sport study by Rose, Strauss, Neundorfer, Symth, and Stuckey (1997) found that differences in stressor appraisal in a sample of caregivers of spouses with Alzheimer disease accounted for females reporting more wishful thinking and acceptance. The authors argued that females tended to be over socialized in comparison to the males. The females demonstrated having a higher need for approval and greater concern for others' needs resulting in higher levels of distress. Ptacek, Smith, Espe, and Raffety (1994b), on the other hand, found that their common achievement stressor, a laboratory based lecture task, resulted in similar appraisal in terms of control and stress but differed in terms of coping preferences exhibited by the male and female participants. That is, females used relatively more social support and emotion-focused coping and males more problem-focused coping strategies. In addition, gender differences in coping preferences remained after controlling for the appraisal variables. A limitation of this study, however, was its relatively small sample size and the ecological validity of the stressor.

A limitation of the present study was that the participants retrospectively recalled how they coped with the stressful scenarios. Research from the mainstream

literature suggests that memory decay can reduce the accuracy of data collected retrospectively (Ptacek et al., 1994b). Secondly, perceived control was selected as a moderator factor because of its established significance in relation to coping (e.g., Skinner et al., 1988). However, the definition used in the current study was relatively simplistic. Control has a number of dimensions (Skinner, Wellborn, & Connell, 1990) and the present study only considered control in terms of the event. Kowalski et al. (2005) showed that control over changing the situation and control over emotions can have different effects on subsequent coping preferences.

In conclusion, the results of the present study found support for the situational hypothesis or role constraint theory in terms of coping preferences. When male and female soccer players appraised a scenario based stressor with similar levels of stress intensity and control they exhibited similar coping preferences. The dispositional hypothesis appears to be a viable explanation for the differences found in the appraisal of scenarios, but not coping. This would suggest that selection of coping strategy is determined by the nature of the stressor and its appraisal and this appears to be invariant between genders. The cognitive appraisal process on the other hand, may be influenced by biological and social factors which can explain differences in appraisal between the genders. It is believed that the current interpretation has important consequences for future research. It would suggest that situational factors need to be assessed to make adequate interpretations of coping preferences exhibited by male and female athletes. In addition, the nature of the stressor and the heterogeneity of the sample in terms of age and years of experience are also important variables which need further investigation. Finally, the results have also implications for practitioners. Previously obtained gender differences would point to differentiating between males and females when teaching coping skills. However, it would be important to first assess the client's cognitive appraisal process before developing coping skills.

CHAPTER 4: STUDY 2

Gender Differences in Stress and Coping during the Execution of a Complex Motor Task

4.1. Abstract

This three experiment study examined whether males and females use different coping strategies in similar stressful situations. Coping was assessed using a think aloud protocol (Ericsson & Simon, 1993). Experiment 1 revealed that the think aloud protocol is a valid and reliable method to assess stress and coping, whilst individuals execute a motor skill over a short period of time. The results of Experiments 2 and 3 found similar stress responses in males and females (e.g., heart rate, task completion time, cognitive anxiety, somatic anxiety, and performance), but there were significant gender differences in relation to the stressors cited and the coping strategies used for these particular stressors. These suggested that the differences in coping strategies observed were likely to be a consequence of the appraisal of the stressful situation. The findings of the present study provide support for the situational hypothesis or role constraint theory as males and females use similar coping strategies if their appraisals of the situation are the same.

4.2. Introduction

When a person evaluates a situation as taxing or exceeding his or her resources and thus endangers well-being the person is experiencing stress (Lazarus & Folkman, 1984). Stress is an inevitable aspect of life, so it is coping that makes the difference in terms of adaptational outcomes. The most dominant model in stress and coping research in sport has been Lazarus' (1999) Transactional Model of Stress and Coping (Nicholls & Polman, 2007a) (see section 2.1 for more detail). This theoretical model views coping with stress as a dynamic and recursive process and involves transactions between the environmental and personal variables (Lazarus, 1999). An important aspect of this model is the two-tiered appraisal that the individual makes, which has been termed primary and secondary appraisal (see section 2.1 for more detail on coping and appraisal).

One of the limitations identified in the stress and coping literature is its assessment (Nicholls & Polman, 2007a). Many studies have been retrospective in nature (e.g., Anshel & Sutarso, 2007; Crocker & Graham, 1995; Qiwei & Anshel, 2006) asking participants to recall stressful situations and subsequent coping preferences with significant time lags. Retrospective assessment can be detrimental not only in terms of accurate recall (forgetting) but also in terms of appraisal significance. For example, reports of coping with resolved situations are distorted by knowledge about success of efforts to resolve the stressful event (Brown & Harris, 1978). Furthermore, cognitive coping is less likely to be reported retrospectively, whereas behavioural coping is more likely to be over-reported (Stone et al., 1998). On the whole, as time passes participants reports about previous events becomes less accurate (Ptacek et al., 1994b).

In order to overcome limitations associated with retrospective recall Nicholls and Polman (2008) recently adopted the think aloud protocol (Ericsson & Simon, 1993) to assess stress and coping during golf performances. Ericsson and Simon (1993)

distinguished between three types of verbal report protocols. Individuals are instructed to verbalize their thoughts and thus think aloud in Level 1 and Level 2 verbalizations. The difference between Level 1 and Level 2 verbalizations is that Level 1 verbalizations do not need to be transformed before being verbalized by the individual (e.g., verbalizing a sequence of numbers while solving a mathematical problem), whereas Level 2 verbalizations require the individual to transform their verbalizations (e.g., transforming images into words). Level 3 verbalizations require participants to verbalize explanations of their thoughts, ideas, or hypotheses (e.g., providing an explanation of why a certain action has been performed). In Nicholls and Polman's study, skilled golfers verbalized their thoughts (Level 2 verbalization) whilst playing six holes of golf. The authors found that stressors and coping strategies varied throughout the six holes, providing support for the notion that stress and coping is a dynamic process that changes across phases of the same performance. However, there are two possible limitations of their study. Firstly, it was unclear whether this methodology influenced actual motor performance, and secondly their study did not assess behavioural and physiological variables that might accompany stress and coping in achievement situations.

People exhibit autonomic (heart rate, blood pressure) and hormonal (epinephrine, cortisol) response to threatening situations. In particular, research has found increases in heart rate when participants were presented with stressful performance situations (Vickers & Williams, 2007). Similarly, stress also has behavioural consequences. Wallbott and Scherer (1991) found that in a stress condition participants showed significantly lower blink rate and more facial activity than in a non-stress control condition. Also, stress has been shown to result in participants taking more time to complete a motor task (Masters, 1992).

A number of variables have been identified which potentially influence the stress and coping process (Hoar et al., 2006; Nicholls & Polman, 2007a). Based on the mainstream psychology literature, it has generally been assumed that male and female athletes utilize different coping strategies to deal with stressors (see section 2.3.1. for more detail). Males are said to use more problem based coping strategies to deal with stressors and are more likely to employ avoidance coping strategies. Females, on the other hand, are said to use more emotion-focused coping strategies including increased use of social support (Tamres et al., 2002). Because emotion-focused strategies might not transform the situation or solve the problem they have been regarded to be maladaptive whereas active problem solving requires engagement and ownership of solutions, which in turn helps the person to cope better with the current problem as well as with similar problems in the future (Soderstrom, Dolbier, Leifman, & Steinhardt, 2000).

Research findings on gender and coping in the domain of sport have been equivocal (see section 2.3.2. for a review). This has been due to methodological limitations of studies including a lack of assessment of situational factors (stressor intensity and perceived control), stressor type, and heterogeneity of samples in terms of sport participation (Billings & Moos, 1984; Folkman & Lazarus, 1980; Nicholls et al., 2007). Furthermore, Ptacek et al. (1994a) noted that the exploration of gender differences has not been the primary focus or has been part of posteriori findings rather than explicit aims of studies.

Two contrasting theories have been postulated in an attempt to explain why males and females may cope differently (see section 2.3.1. for more detail). The dispositional hypothesis posits that males and females have different underlying characteristics that cause different coping preferences (Tamres et al., 2002). By contrast the situational hypothesis (Tamres et al., 2002), or role constraint theory (Rosario et al.,

1988), suggests that situations influence coping. That is, differences in coping are the result of the different roles males and females occupy in society and the different stressors they encounter. In this way, this study aims to compare the utility of the dispositional and situational or role constraint theory in determining gendered ways of coping.

The aims of these three experiments were two fold. In Experiment 1 the effects of concurrent Level 2 verbalization on the execution of a complex novel motor task were explored, in order to investigate whether the think aloud protocol is a suitable method to assess coping online without influencing performance. Experiments 2 and 3 investigated the effects of various forms of stress on a complex motor skill (golf putting task) performance. In particular, these studies examined the effect of gender on stress appraisal, physiological response, behaviour, and coping preferences during a control and experimental condition. Due to the past equivocal findings and methodological limitations outlined previously (see section 2.3.2.; Study 1 for more detail) when investigating gender differences in coping in sport, no directional hypothesis can be stated in the current study. Based on the dispositional hypothesis it is predicted that gender differences in coping will be found in this study among male and female, whereas the situational hypothesis/role constraint theory predicts that gender differences will disappear when males and females face the same stressor and take on similar social roles (Sigmon et al., 1995).

4.3. Experiment 1

4.3.1. Introduction

Experiment 1 investigated whether think aloud influences performance during a complex novel motor task. The think aloud protocol (Ericsson & Simon, 1993), and in particular Level 2 verbalization, has been shown to be a successful and ecological

approach to assess stress and coping preferences in sport (Nicholls & Polman, 2008). Although think aloud protocols have previously been criticized (Gagné & Smith, 1962), Ericsson and Simon, in their review of literature, reported that concurrent verbal expressions of one's thoughts did not alter performance compared to completing the same tasks silently. However, few studies have been conducted in which participants execute complex novel motor tasks whilst verbally expressing their thoughts. Thus, the aim of experiment 1 was to address previous criticisms to the think aloud protocol and investigate whether the protocol is a suitable measure to assess coping online in future experiments without decreasing motor performance. It is important to highlight that as no limitation has been associated previously between the use of the think aloud protocol and gender, no further investigation would be needed in this area. Based on the previous literature it was predicted that Level 2 think aloud would not impair performance on a complex novel motor task (Ericsson, 2006).

4.3.2. Method

4.3.2.1. Participants

Participants were (n = 60; 49 males and 11 females) aged between 17 to 36 years (M age = 21.83 years, SD = 3.87) and were British undergraduate students. Inclusion in the experiment was conditional on participants not possessing an official golf handicap or being a member of a golf club. Each participant was randomly assigned to one of two conditions. In the control condition (n = 30; 25 male and 5 female) participants completed the novel complex motor task without think aloud. In the experimental condition (n = 30; 24 male and 6 female) participants completed the novel complex motor task whilst engaging in Level 2 verbalization. The experiment was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating.

4.3.2.2. Apparatus

The golf putting task was completed on an elevated 15 cm wooden putting surface 4 m in length and 1.80 m wide which was covered with a red carpet. A standard golf putter and white golf balls of standard dimensions (size 4.27 cm) were used by all participants. Putts were made from a distance of 230 cm from the hole, which was 10.8 cm in diameter (the size enforced by the British Professional Golf Association). Participants' verbalizations were recorded using a digital voice recorder (Olympus WS-320M) and microphone. The voice recorder was placed in one of the participant's pockets and the microphone was clipped on the participant's collar.

4.3.2.3. Procedure

In both conditions participants conducted 20 attempts at holing the ball. In the experimental condition participants were required to think aloud. Instructions for the think aloud protocol were adapted to golf putting based upon the guidelines set out by Ericsson and Simon (1993) and those previously used by Nicholls and Polman (2008). It was emphasized that the participants were not required to explain their thoughts, but to say what they were thinking (Level 2 verbalization). Each participant was instructed to talk continuously throughout the 20 attempts, apart from when they were just about to take the putter back for their shot (e.g., Nicholls & Polman). Participants were asked to resume talking immediately after completing their swing. Each participant was told that if they were silent over a long period (10 seconds), they would be asked to resume thinking aloud.

Before the start of the experiment the experimental group took part in a series of think aloud practice exercises to assure that they could think aloud appropriately (Ericsson & Simon, 1993). This practice consisted of three different tasks: (a) counting the numbers of dots on a page; (b) an arithmetic exercise, and, (c) an anagram problem-solving task. All the participants grasped thinking aloud while performing a task during

the warm-up period, therefore no more additional tasks were completed.

4.3.2.4. Statistical analysis

An independent t-test was conducted on performance (number of putts holed) on the first 10 attempts and for the full 20 attempts. A t-test was conducted for the first 10 attempts because of the possibility that in particular initial performance would be affected by thinking aloud whilst performing a novel motor task. Levene's test was used to check for equality of variance.

4.3.3. Results

For the first 10 attempts participants in the control condition holed on average 3.8 (*SD* = 2.23) putts whereas participants in the experimental condition holed 4.40 (*SD* = 2.75) attempts. This was not statistically different ($t_{(58)}$ = -.93, p = .36). However, participants in the experimental condition (9.70, *SD* = 4.08) holed significantly more ($t_{(58)}$ = -2.13, p = .04) putts over the 20 attempts than participants in the control condition (7.43, *SD* = 4.16).

4.3.4. Discussion

The results of Experiment 1 provide support for the notion that verbalizing thoughts when executing a novel complex motor task does not result in decrements in performance (Ericsson & Simon, 1993). In contrast, the present experiment found that participants in the experimental condition showed significantly better motor performance than those in the control condition. Although all participants were novel to the task at hand and only completed twenty attempts, these results would suggest that thinking aloud is a valid and reliable method to assess stress and coping whilst executing a motor skill over a short period of time.

4.4. Experiment 2

4.4.1. Introduction

Performance pressure can be described as an anxious desire to perform at the highest level in a particular situation (Hardy, Mullen, & Jones, 1996). Although it is believed that performance pressure induces stress, it is equivocal whether appraisal of stressful events is experienced in the same way by males and females and whether this influences coping preferences. In their recent study with endurance athletes, Hammermeister and Burton (2004) found that males and females experienced similar levels of threat over a stressful situation, but males and females differed in their perceptions of control. Although male endurance athletes perceived higher levels of control than their female counterparts, stress appraisal was not considered when analysing coping. Conversely, Kowalski et al. (2005) did not find any differences in stress or control beliefs between males and females in a sample of adolescent athletes. In their meta-analysis of gender differences in stress and coping Tamres et al. (2002) found that in six of the eight studies that assessed gender differences in achievement situations, females appraised the situation with higher levels of stress intensity and stressor appraisals were found to be a moderator in explaining coping preferences. That is, coping preferences were found to be used more often only in studies in which females appraised the stressor as more severe. The aim of Experiment 2 was to investigate the influence of gender in the stress appraisal and coping process during the execution of a novel complex motor task (golf putting) during a control and experimental condition, in which increased stress was induced. It was predicted that if males and females experienced similar levels of stress (e.g., heart rate), appraised the stressful event similarly (e.g., stressor type), and reported similar coping strategies this would provide support for the situational hypothesis or role constraint theory. Alternatively, if males and females exhibited different coping strategies whilst

appraising the situation similarly this would provide support for the dispositional hypothesis.

4.4.2. Method

4.4.2.1. Participants

Participants were 37 (19 males and 18 females) British undergraduate students aged between 19 to 22 years (*M* age = 20.74 years; *SD* = 1.87). Inclusion in the experiment was conditional on participants not possessing an official golf handicap or being a member of a golf club. The study was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating (see appendix B).

4.4.2.2. Apparatus and Questionnaire

This study used the same golfing equipment as outlined in Experiment 1 (see section 4.3.2.). In addition a "mildly funny putter" (Beilock & Carr, 2001) consisting of a regular putter head attached to an S-shaped curved and arbitrarily weighted putter shaft was used by participants in the experimental condition.

Heart rate was assessed every 5 seconds using the 810 Polar Heart Rate monitor (Kempele, Finland) and anxiety was measured via the revised Competitive State Anxiety Inventory (CSAI-2R; Cox, Martens, & Russell, 2003) (see appendix B). The CSAI-2R is a multidimensional domain specific instrument to assess anxiety in competitive sport situations. It consists of 17 questions with a four-point Likert type response scale ('Not at all' to 'Very much'). The response set 'How are you feeling right now?' was used. The CSAI-2R has three factors: somatic anxiety (seven questions), cognitive anxiety (five questions) and self-confidence (five questions). Scores for each subscale are obtained by adding up all items for each scale and dividing this by the number of items and multiplying by 10 (range of scores between 10-40).

Good psychometric properties (reliability and fit indicators) were reported for the CSAI-2R in the confirmatory factor analysis study by Cox et al. (2003).

Task completion time was recorded in the present experiment with a stopwatch (Fastime 2, Leicestershire, United Kingdom) and a video camera (Sony DCR-VX1000E Camcorder, Thatcham, United Kingdom) mounted on a tripod. Participants' verbalizations were recorded using a digital voice recorder (Olympus WS-320M, China) and microphone. The voice recorder was placed in one of the participant's pockets whereas the microphone was clipped on the participant's collar.

4.4.2.3. Procedure

The experiment had two distinct conditions (control and experimental condition) which were presented in a counter balanced order across participants. In both conditions participants were required to putt 20 golf balls to a hole from a distance of 230cm. After completing the informed consent form participants first attached the heart-rate monitor belt to their chest and watch to their wrist and were required to sit quietly for 4 minutes to obtain baseline heart-rate. Following this, the think aloud procedure was explained and the training exercises were conducted. All the participants grasped thinking aloud while performing a task during the warm-up period, therefore no more additional tasks were completed.

Prior to starting the golf putting task in the control condition, participants completed the CSAI-2R. In this condition a standard golf putter was used. In the experimental condition stress was induced using a combination of evaluation apprehension, financial inducement, and the introduction of a 'mildly funny putter.' Previous studies (Heaton & Sigall, 1991; Lewis & Lindner, 1997; Stinear, Coxon, Fleming, Lim, Prapavessis, & Byblow, 2006) have successfully used video cameras and monetary inducements (e.g., Nicholls & Polman, 2008) to invoke stress among participants in achievement situations. When participants performed in the experimental

condition a video camera was brought into the room and placed to the side and top of the golfing surface. This ensured that participants were aware of being videotaped but the camera did not hinder the line of sight. The following statement was then provided:

> *In the next set of 20 putts we would like you to use a newly designed putter which is said to improve golf-putting performance. In addition to this, we are going to film this part of the session. We are keen to discover how people adapt to using this new putter. Finally, although we suggested that you could potentially earn £5 pounds by participating in this experiment we believe that you will need to earn this reward. To this end, for every put you miss we will deduct 20 pence from the possible £5 pounds you can earn with participating in this experiment. Remember, you will still need to think aloud when putting the 20 balls. If you have any questions please ask the researchers present.*

Following this statement, the 'mildly funny putter' was introduced and the participants were requested to complete the CSAI-2R. Before starting putting the video camera was switched on and no time constraints were imposed on subjects. However, the total time taken to complete the set of 20 putts (task completion time) was recorded (from the start of the first attempt until finishing the final attempt) in both conditions using a stop watch. Successful performance was defined by the ball dropping in the hole and was recorded by the researcher for each attempt. Heart rate was calculated as an average for each condition.

4.4.2.4. Analysis Strategy

Means, standard deviations, and internal consistency were calculated prior to statistical analysis. Repeated measures analysis of variance was conducted to establish whether there were differences between the genders in the control and experimental condition for the dependent variables heart rate, task completion time, state anxiety, and

performance. Homogeneity was tested using Levene's and Box's M statistic and sphericity was assessed using Mauchly's test of sphericity (see appendix E).

The think aloud data sets for the experimental condition were subjected to protocol analysis (Ericsson & Simon, 1993). Data were transcribed verbatim, and each transcript was subjected to checks for relevance and consistency. To fulfill the relevance criterion the verbalizations by the participants should be relevant to the task, which in this case meant verbalizations associated with golf putting performance. Data which were not relevant to the task, such as verbalizations about a "football match," "girlfriend," and a "car" were removed from the data set. To fulfill the consistency criterion, verbalizations should be consistent with verbalizations that precede them. Streams of consistent verbalizations are assumed to represent cognitive processes and, "they can be used as evidence for the course and nature of these processes" (Ericsson & Simon, 1993, p. 170).

Following checks for relevance and consistency, each transcript was subjected to line-by-line inductive content analysis (Maykut & Morehouse, 1994) to identify stressors and coping responses. Verbalizations that the researcher perceived had caused the golfers negative concern or worry, or had the potential to do so were coded as stressors, whereas verbalizations that involved the golfers attempting to manage a stressor, were coded as coping strategies. Although some data were relevant to the golf putting task and consistent to the participant's performances, they were not coded as either a stressor or a coping strategy, so they were subsequently removed from the analysis. Previous research with adolescent golfers (Nicholls, Holt, & Polman, 2005a; Nicholls, Holt, Polman, & James, 2005b) provided verification in determining stressors and coping strategies codings. Similar stressors and coping strategies were grouped together as first-order themes and assigned a descriptive label and a rule of inclusion was written for each theme. The level of agreement between the researcher and the PhD

supervisor was 100%. Stressors and coping strategies were tallied across the sample for the males and females for the experimental condition only. The Chi-square statistic was used to compare differences for gender (male – female) in total number of stressors reported and for number of problem-focused, emotion-focused and avoidance coping strategies. It is important to highlight that the categorization of coping into higher order dimensions in this experiment was conducted to compare differences for gender (male – female) using the Chi-square statistic. In addition, where possible differences in individual stressors or coping strategies were compared. First of all, the relative frequency of the reported stressors and coping strategies (absolute number of reported coping strategies divided by the total number of participants from which data were obtained) were calculated. Due to the notion that the Chi-square statistic is influenced by the number of observations the percentage score for analysis was used.

4.4.3. Results

4.4.3.1. Stress Intervention

Table 5 provides the results of the dependent variables for the males and females in both the control and experimental condition. Adequate reliability was obtained for the somatic (α = .83 and .86), cognitive (α = .87 and .84) and self-confidence (α = .84 and .87) subscales of the CSAI-2R, for both sets of assessments.

Table 5: Means and standard deviations for the dependent variables for the males and females separately and for the sample as a whole in the control and experimental conditions for Experiment 2.

	Male control		Female control		Overall control		Male experimental		Female experimental		Overall Experimental	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Heart-rate (BPM)	95.65	10.02	92.08	9.95	93.91	10.01	98.77	9.91	95.24	9.91	97.06	9.94
Task completion time (minutes)	4.76	1.55	4.45	1.40	4.61	1.47	5.39	1.64	4.98	1.45	5.19	1.54
Somatic anxiety	16.16	5.31	14.60	4.53	15.40	4.93	16.47	3.91	17.06	5.29	16.75	4.57
Cognitive anxiety	19.26	6.01	17.22	5.27	18.27	5.67	20.94	5.31	21.44	6.46	21.18	5.82
Self-confidence	26.52	6.03	21.00	6.55	23.83	6.80	25.36	6.76	20.77	6.18	23.13	6.81
Performance	9.89	5.65	6.44	3.31	8.21	4.92	9.26	4.45	6.72	3.59	8.02	4.20

Table 6 provides the results of the repeated measures ANOVA. Significant condition main effects were obtained for heart-rate, task completion time, and cognitive anxiety. Participants exhibited significantly higher average heart-rate, took more time to complete the task, and had a higher level of pre-condition cognitive state anxiety in the experimental condition in comparison to the control condition. This would suggest that the experiment was successful in inducing increased levels of stress in the participants. However, no difference was obtained for somatic state-anxiety or performance.

4.4.3.2. Gender differences

No differences were observed between the males and females in terms of stress appraisal. The male and female participants appeared to respond similarly to the stress condition in terms of heart-rate, task completion time, and self-reported somatic and cognitive state anxiety. However males and females differed in terms of self confidence. Males exhibited significantly higher self confidence than females.

Table 6: Results of the repeated measures analysis of variance (gender (2) by condition (no-stress vs. stress) including effect size for Experiment 2.

	Gender main effect F(1,31)	Condition main effect F(1,31)	Gender by condition interaction F(1,31)
Heart-rate (bpm)	1.13, p = .26, partial η^2 = .04	9.41, p = .004, partial η^2 = .21**	.00, p = .98, partial η^2 = .00
Task completion time	.55, p = .55, partial η^2 = .02	22.58, p < .001, partial η^2 = .39**	.16, p = .69, partial η^2 = .01
Somatic anxiety	.14, p = .71, partial η^2 = .01	2.32; p= .14, partial η^2 = .06	1.42, p = .24, partial η^2 = .04
Cognitive anxiety	.22, p = .64, partial η^2 = .01	9.33, p = .004, partial η^2 = .21**	1.72, p = .20, partial η^2 = .05
Self-confidence	7.45, p = .01, partial η^2 = .17*	.48, p = .49, partial η^2 = .01	.22, p = .64, partial η^2 = .01
Performance	5.11, p = .03, partial η^2 = .13*	.10, p = .75, partial η^2 = .00	0.66, p = .42, partial η^2 = .02

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

4.4.4.3. Stress and Coping

Table 7 provides an overview of the frequency of reported stressors by the male and female participants in the experimental stress condition. Note, due to technical malfunction data were only available for 16 males and 15 females. In total nine different stressors were identified. Four of the stressors were associated with the experimental set-up (evaluation apprehension, financial inducement, putter, speak aloud) and two with performing the task (task execution, physical discomfort). The final three stressors were goal endangerment, lack of concentration, outcome. No differences were found between the males and females in the total number of stressors reported in the experimental stress condition (χ^2 = 0.64, p = .42). However, the females reported significantly more frequently the putter (χ^2 = 19.31, p < .001) and task execution (χ^2 =

11.56, $p < .001$) as a stressor whereas the males reported outcome ($\chi^2 = 4.00$, $p = .05$) as a stressor more often than the females.

Table 7: The stressors reported by the females and males in the experimental stress condition in Experiment 2.

Stressors	Males experimental (n = 16)	Females experimental (n = 15)
Evaluation apprehension	3 (2) 1 to 2 0.18	5 (5) 1 to 1 0.33
Financial inducement	21 (8) 1 to 4 1.31	22 (9)1 to 4 1.46
Putter*	13 (7) 1 to 4 0.81	32 (12) 1 to 5 2.1
Goal endangerment	-	1 (1) 1 to 1 0.06
Lack of concentration	2 (1) 2 to 2 0.12	2 (2) 1 to 1 0.12
Task execution*	15 (9) 1 to 4 0.93	29 (11) 1 to 6 1.93
Outcome*	37 (12) 1 to 5 2.31	23 (10) 1 to 4 1.53
Physical discomfort	8 (5) 1 to 2 0.5	3 (2) 1 to 2 0.2
Speak aloud	1 (1) 1 to 1 0.06	7 (3) 1 to 3 0.46
Total	6.22	7.19

Note: The first number represents the absolute frequency of the reported stressors with between brackets how many participants reported this stressor followed by the range. Finally, the relative frequency is reported (absolute number divided by the total number of participants from which data were obtained). *$p < .05$.

Table 8 provides an overview of the frequency of reported coping preferences by the male and female participants in the experimental condition at both the dimensional and strategy levels. The participants reported a total of 13 coping strategies of which five could be classified as problem-focused (planning, concentration, technique, goal-setting, take time), five as emotion-focused (relaxation, positive self-talk, acceptance, imagery, wishful thinking), and three as avoidance (blocking, external attribution, lack of coping) coping strategies (see also Nicholls et al., 2007). At the dimensional level

males reported more emotion-focused coping strategies than the females ($\chi^2 = 4.00$, $p = .05$) whereas the females reported more avoidance strategies than the males ($\chi^2 = 4.00$, $p = .05$). In particular, males reported the emotion-focused strategies positive self-talk and relaxation more often than the females. Females, on the other hand, reported the avoidance coping strategies external attribution and lack of coping more than the males. Males and females did not differ in the number of problem-focused ($\chi^2 = 1.44$, $p = .23$) or total number ($\chi^2 = 1.44$, $p = .23$) of coping responses. However, there was a tendency for males to report planning more often than the females.

Table 8: The coping strategies reported by the females and males in the experimental stress condition in Experiment 2.

Coping	Males Experimental (n = 16)	Females Experimental (n = 15)
Problem-focused coping		
Concentration	6 (5) 1 to 2 0.37	9 (5) 1 to 2 0.6
Goal setting	17 (9) 1 to 6 1.06	13 (9) 1 to 2 0.86
Planning	9 (4) 1 to 3 0.56	1 (1) 1 to 1 0.06
Take time	6 (2) 3 to 3 0.37	6 (6) 1 to 1 0.4
Technique	26 (8) 1 to 8 1.62	18 (8) 1 to 4 1.2
Total PFC	3.98	3.12
Emotion-focused coping		
Acceptance	10 (6) 1 to 3 0.62	11 (7) 1 to 3 0.73
Imagery	4 (2) 1 to 3 0.25	1 (1) 1 to 1 0.06
Positive self-talk*	62 (13) 1 to 8 3.87	42 (13) 1 to 6 2.8
Relaxation	10 (4) 1 to 4 0.62	2 (2) 1 to 1 0.13
Wishful thinking	2 (2) 1 to 1 0.12	-
Total EFC*	5.48	3.72
Avoidance coping		
Blocking	8 (5) 1 to 2 0.5	4 (2) 2 to 2 0.26
Lack of coping	1 (1) 1 to 1 0.06	6 (5) 1 to 2 0.4
External attribution	5 (3) 1 to 3 0.31	10 (8) 1 to 2 0.66
Total AC*	0.87	1.32
Overall total*	10.33	8.16

Note: The first number represents the absolute frequency of the reported coping strategies with between brackets how many participants reported this strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported coping strategies divided by the total number of participants from whom data were obtained). *$p < .05$.

Table 9 provides an overview of the coping preferences by the male and female participants in the experimental condition in relation to the stressors reported. It appears

that differences in coping preferences observed are associated with the males and females appraising the stressful situation differently. For example, the males have a tendency to use positive self-talk and relaxation in relation to the stressors outcome and task execution and the problem-focused coping strategies goal setting and planning for the stressor outcome. Females, on the other hand, used external attributions for the putter and task execution stressors. Few differences in coping preferences were observed for stressors which were reported with equal frequency by the male and female participants.

Table 9: The stressors reported by the females and males in the experimental stress condition in Experiment 2 and the coping strategies utilised to deal with each stressor.

Stressors	Coping	Males experimental (n = 16)	Females experimental (n = 15)
Evaluation apprehension	Take time	-	1 (1) 1 to 1 0.06
	Positive self-talk	2 (1) 2 to 2 0.12	1 (1) 1 to 1 0.06
	Relaxation	-	1 (1) 1 to 1 0.06
Financial inducement	Concentration	2 (2) 1 to 1 0.12	2 (2) 1 to 1 0.12
	Planning	3 (2) 1 to 2 0.19	1 (1) 1 to 1 0.06
	Take time	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.06
	Technique	4 (2) 2 to 2 0.25	3 (2) 1 to 2 0.2
	Acceptance	1 (1) 1 to 1 0.06	2 (2) 1 to 1 0.12
	Positive self-talk	10 (5) 1 to 3 0.63	7 (4) 1 to 3 0.47
	Relaxation	1 (1) 1 to 1 0.06	-
	Blocking	1 (1) 1 to 1 0.06	-
	External attribution	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.06
Putter*	Concentration	3 (2) 1 to 2 0.18	-
	Goal setting	1 (1) 1 to 1 0.06	2 (2) 1 to 1 0.12
	Take time	-	1 (1) 1 to 1

			0.06
	Acceptance	-	5 (3) 1 to 2 0.33
	Positive self-talk	5 (3) 1 to 2 0.31	8 (4) 1 to 3 0.53
	Relaxation	1 (1) 1 to 1 0.06	-
	Blocking	2 (2) 1 to 1 0.12	-
	External attribution	-	3 (2) 1 to 2 0.2
Task execution*	Concentration	1 (1) 1 to 1 0.06	3 (2) 1 to 2 0.2
	Goal setting	4 (3) 1 to 2 0.25	4 (3) 1 to 2 0.26
	Take time	5 (3) 1 to 3 0.31	1 (1) 1 to 1 0.06
	Technique	22 (6) to 8 1.37	15 (5) 1 to 4 1
	Acceptance	5 (3) 1 to 3 0.31	4 (3) 1 to 3 0.26
	Imagery	4 (3) 1 to 3 0.25	1 (1) 1 to 1 0.06
	Positive self-talk	32 (8) 1 to 8 2	21 (6) 1 to 6 1.4
	Relaxation	6 (2) 2 to 4 0.25	2 (2) 1 to 1 0.12
	Blocking	4 (2) 1 to 2 0.25	4 (2) 2 to 2 0.26
	Lack of coping	1 (1) 1 to 1 0.06	3 (3) 1 to 1 0.2
	External attribution	4 (2) 1 to 3 0.25	6 (4) 1 to 2 0.4
Outcome*	Goal setting	12 (3) 3 to 6 0.75	4 (3) 1 to 2 0.26
	Planning	6 (3) 1 to 3 0.37	
	Take time	-	1 (1) 1 to 1 0.06
	Acceptance	4 (3) 1 to 2 0.25	-
	Positive self-talk	10 (5) 1 to 3 0.63	2 (2) 1 to 1 0.12
	Relaxation	2 (2) 1 to 1 0.25	-
	External attribution	1 (1) 1 to 1 0.06	-
Physical discomfort	Goal setting	-	3 (3) 1 to 1 0.2
	Take time	-	1 (1) 1 to 1 0.06
	Positive self-talk	1 (1) 1 to 1	2 (2) 1 to 1

		0.06	0.12
	Wishful thinking	2 (2) 1 to 1 0.25	
	Blocking	1 (1) 1 to 1 0.06	-
Speak aloud	Concentration	-	4 (2) 1 to 2 0.26
	Positive self-talk	2 (2) 1 to 1 0.12	1 (1) 1 to 1 0.06
	Lack of coping	-	3 (2) 1 to 2 0.2

Note: The first number represents the absolute frequency of the reported coping strategies with between brackets how many participants reported this strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported coping strategies divided by the total number of participants from whom data were obtained). *$p < .05$.

4.4.4. Discussion

The aim of this experiment was to investigate the effects of gender in the stress and coping process during the execution of a novel complex motor task (golf putting). The results revealed that the experiment was successful in inducing stress among the participants, as small but significant increases in heart-rate, cognitive anxiety, and task completion time were observed in the experimental condition compared to the control condition. However, an increased level of stress did not result in performance decrements or changes in somatic anxiety. This corroborates the previous literature as Woodman and Hardy (2003) stated that self-reported somatic anxiety is of limited theoretical value in explaining the relationship between physiological arousal and performance.

The current experiment showed that the experimentally induced stress was experienced similarly by the male and female participants in terms of somatic (increased heart-rate), cognitive (cognitive anxiety), behavioural (task completion time), and performance (absence of performance decrements) indices. The absence of any gender main effects would suggest that males and females perceived similar levels of stress intensity. However, males and females differed in terms of self-confidence. In particular, males showed significantly higher levels of self-confidence than the females. As mentioned previously in the current thesis (see section 2.3.1.) sport has traditionally been restricted to and associated with males, and masculinity stereotypes in the past (Woolum, 1998; Sherrow, 1996). In addition, stereotypes of "appropriate" and "inappropriate" sports for males and females are still common in more recent studies (Riemer & Visio, 2003; Schmalz & Kerstetter, 2006). In this way, it is suggested that the particular task in the current experiment may have been interpreted as a masculine

activity, resulting in males feeling more confident to perform successfully than the females.

When examining the type of stressors reported using the think aloud protocol some differences in gender were found. Females were significantly more concerned with the funny putter and technique than the males. The males, on the other hand, were more concerned with the outcome. Such findings are similar to those found in previous studies in which males and females differed in the types of stressful events reported (Billings & Moos, 1984; Folkman & Lazarus, 1980). For example, in a community sample study, males reported experiencing more stressful events associated with work and finance and females reported more stressful events having to do with health and family (Ptaceck et al., 1994a). However, this appears to be the first study which has investigated differences in stressor type in an achievement situation.

Males have been found to be more concerned with the outcome (ego-orientation) in achievement situations and to be more competitive than females (Gilll, 1992; Spencer & Helmreich, 1983; Urdan, 1997; Vazou, Ntoumanis & Duda, 2006; Veroff, 1977; White & Duda, 1994). Such gender differences in motivational/goal orientation could explain why the females in the present experiment were more concerned with task execution and as such were more concerned by the putter than the males. Similarly, this would explain why the males reported outcome, an ego-orientated stressor, more than the females in the experimental condition.

Alternatively, sport tasks have been found to be perceived as masculine activities (Gill, 2002) resulting in females perceiving less competence and control over the actual outcome of the task and perceiving external aspects such as the putter and skill execution as more threatening. Previous research has shown that males and females differ in control appraisals, with males reporting higher levels of control over stressful situations than females (Dickerson & Kemeny, 2004; Sigmon et al., 1995). Although

control was not assessed in the present experiment, it could be suggested that the males had higher levels of perceived control than females in the stress condition. This resulted in the males reporting outcome, which is likely to be a more controllable stressor, and the females reporting technique and the putter as a source of stress.

When analyzing coping preferences across gender some differences at the dimensional and strategy level were found. Males appeared to use more emotion-focused (positive self-talk, relaxation) and females more avoidance coping (external attribution, lack of coping) strategies. However, these differences appeared to be associated by the males and females appraising the situation differently. That is, differences in coping were mainly observed for stressors which were reported more or less frequently by the male and female participants. This supports previous research which has found that individuals cope differently depending on the stressor (Lee-Baggley et al., 2005). This would suggest that gender differences in coping are the result of the appraisal process rather than gender per se (Folkman & Lazarus, 1980), providing support for the situational/role constraint theory. A possible explanation why the male and female participants varied in the stressor type selected on the experimental situation might be due to the notion that males are generally more physically active than females and females show a steeper decline in sport participation during adolescence (e.g., Stone, McKenzie, Welk, & Booth, 1998; World Health Organization, 2000). In addition, there is support for the notion that parents provide different types of athletic experience for boys in comparison to girls (Brustad, 1993). However, further qualitative research might provide more information why males and females might appraise achievement situations differently.

In conclusion, in a situation where males and females experience stress, males appeared to be more concerned with performance aspects whereas the females were more concerned with technique and the putter. Consequently, males reported more

emotion-focused coping and females more avoidance coping strategies. It is believed that these differences in coping preferences are related to differences in the frequency of reported stressor type by the male and female participants rather than gender per se. As such the experiment provides support for the situational hypothesis or role constraint theory.

4.5. Experiment 3

4.5.1. Introduction

The findings of Experiment 2 supported Tamres et al's. (2002) suggestion that gender differences in coping are more likely the result of differences in the appraisal process. In particular, Tamres et al. reported that females appraised achievement situations with higher levels of stress intensity than males. Although no differences between the genders were found in stress intensity (primary appraisal), the male and female participants differed in the frequency of reported stressor type. It was suggested that these differences in stressor appraisal were associated with differences in perceptions of control (Lazarus & Folkman, 1984). Secondary appraisal (Folkman, 1984; Lazarus & Folkman, 1984), in this respect, reflects the extent to which one perceives to have potential control as well as the belief one can successfully perform the behaviours necessary to deal with the situation (see section 2.1. for more detail). There is consistent evidence that event control beliefs influence situational coping responses. For example, problem-focused coping strategies are preferred in situations appraised to be controllable (Carver et al., 1989; Zakowski et al., 2001). Such situations allow individuals to believe that efforts aimed at managing the stressor will not be in vain (Pearlin & Schooler, 1978). On the other hand, perceptions of low controllability increase emotional distress and would require emotion-focused coping strategies (Aldwin, 1991; Folkman & Lazarus, 1980).

Experiment 3 addressed one of the limitations of Experiment 2 by assessing participant's control beliefs. The assessment of control has been controversial (Skinner, 1996; Thoits, 1991) (see section 2.1. for more detail). The present experiment retrospectively measured subjective behavioural control over a specific event without reference to the specific means of accomplishing control (Skinner et al., 1988; Weisz, 1986). That is, the experiment did not assess self-efficacy beliefs (agent-means beliefs) that one is capable of producing the required response. In addition, in order to potentially increase the stress response a different approach was used to elicit stress from that used in Experiment 2. In particular, participants played for a cash prize and were provided with ego-threatening feedback. Such stressors are aimed at increasing the importance of performing well in the task and competition among participants (Baumeister, 1984). As such, Experiment 3 had the same aim and hypothesis as experiment 2 (see section 4.3.2.).

4.5.2. Method

4.5.2.1. Participants

Participants were 31 (17 males and 14 females) British undergraduate students aged between 18 and 45 years (*M* age = 23.35 years; *SD* = 7.30). Inclusion in the experiment was conditional on participants not possessing an official golf handicap or being a member of a golf club. The experiment was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating.

4.5.2.2. Apparatus and Questionnaire

This experiment used the same golfing equipment as outlined in Experiment 2 (see section 4.4.2.). In addition participants completed a horizontal visual analogue scale to assess their level of stress intensity and control over the stress intervention (see

appendix B). Participants were asked to rate each item by dissection a 10 cm bipolar line anchored by two statements (‘*not at all stressful’* vs. *‘extremely stressful’* and *‘no control at all’* versus *‘full control’*). The ‘stress thermometer’ has already demonstrated normal distribution properties and adequate variability (Kowalski & Crocker, 2001). The present experiment measured control over the stress intervention without reference to the specific means of accomplishing control (Skinner et al., 1988; Weisz, 1986). Previous studies that have adopted such an approach to assess perceptions of control have used one item questions requiring a response on a Likert-type scale (e.g., Compa et al, 1988; Folkman & Lazarus, 1980; Gamble, 1994).

4.5.2.3. Procedure

As observed in experiment 1, and 2 all the participants grasped thinking aloud while performing a task during the warm-up period, therefore no more additional tasks were completed. Similar procedures were followed as in Experiment 2 (see section 4.4.2.). However, changes were introduced in the induction of stress. Stress was induced using a combination of evaluation apprehension, prize money, the introduction of a ‘mildly funny putter’, and ego-threatening feedback. The following statement was then provided at the beginning of the stress condition:

> *In the next set of 20 putts we would like you to use a newly designed putter which is said to improve golf-putting performance. In addition to this we are going to film this part of the session. We are keen to discover how people adapt to using this new putter. In addition, we will have a prize for the person who holes the most putts. You can win £25 pounds if you are the person who holes the most putts.* After 10 attempts additional information was provided to the participants that included ego-threatening feedback: *So far, your performance is worse than expected you have holed* (number of putts they had missed so far) *putts less than the best performer.*

4.5.2.4. Analysis Strategy

A similar analysis strategy was adopted as previously described for Experiment 2 (see section 4.4.2.). In addition, independent t-tests were conducted to establish whether the males and females differed in self-reported stress intensity, and control.

4.5.3. Results

4.5.3.1. Stress Intervention

Table 10 provides the means and standard deviations of the dependent variables for the males and females in both the control and experimental stress condition. Again adequate reliability was obtained for the somatic (α = .82 and .73) cognitive (α = .86 and .76) and self-confidence (α = .89 and .90) subscales of the CSAI-2R, for both sets of assessments.

Table 10: Means and standard deviations for the dependent variables for the males and females separately in the control and experimental conditions for Experiment 3.

	Male control		Female control		Overall control		Male experimental		Female experimental		Overall experimental	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Heart-rate (BPM)	91.29	15.68	86.43	9.24	89.06	13.19	93.41	16.98	88.21	8.28	91.06	13.80
Task completion time (minutes)	4.05	1.35	3.61	0.67	3.85	1.10	4.77	1.48	4.34	0.98	4.57	1.27
Somatic anxiety	14.11	4.19	13.67	3.20	13.91	3.72	13.94	4.41	15.92	4.55	14.84	4.51
Cognitive anxiety	13.88	4.32	16.71	5.24	15.16	4.89	14.94	6.09	17.57	6.08	16.12	6.13
Self-confidence	26.59	8.35	21.14	6.40	23.81	8.09	25.52	9.57	21.71	5.42	24.13	7.92
Performance	11.18	3.89	8.86	5.08	10.13	4.54	9.19	4.28	8.00	5.05	8.65	4.60

Table 11 provides the results of the repeated measures ANOVA. Significant condition main effects were obtained for heart-rate, task completion time and performance. Participants exhibited significantly higher average heart-rate, took more time to complete the task in the experimental condition when compared with the control condition. In addition participants performed significantly better in the control condition compared with the experimental condition. These findings suggest that the experiment was successful in inducing increased levels of stress. Although the participants reported higher levels of cognitive and somatic state anxiety prior to the experimental condition this was not statistically significant from the control condition.

4.5.3.2. Gender differences

No differences were observed in terms of stress appraisal between the male and female participants. Despite the increase in stress levels experienced in the study males and females showed similar appraisal in terms of heart-rate, self-reported somatic, and cognitive state anxiety, self-confidence levels, task completion time and performance. In addition the male and female participants did not report different levels of stress intensity ($t_{29} = 0.07$; $p = .95$) or perceived control ($t_{29} = 0.43$; $p = .67$) after completion of the experiment.

Table 11: Results of the repeated measures analysis of variance (gender (2)) by condition (control vs. experimental) including effect size for Experiment 3.

	Gender main effect $F(1,29)$	Condition main effect $F(1,29)$	Gender by condition interaction $F(1,29)$
Heart rate (bpm)	1.09, $p = .31$, partial $\eta^2 = .04$	8.65, $p = .01$, partial $\eta^2 = .23$*	.06, $p = .80$, partial $\eta^2 = .00$
Task completion time	1.12, $p = .30$, partial $\eta^2 = .04$	28.13, $p < .001$, partial $\eta^2 = .50$**	.00, $p = .99$, partial $\eta^2 = .00$
Somatic anxiety	.32, $p = .58$, partial $\eta^2 = .01$	2.75; $p = .11$, partial $\eta^2 = .09$	3.71, $p = .06$, partial $\eta^2 = .11$
Cognitive anxiety	2.22, $p = .15$, partial $\eta^2 = .07$	1.77, $p = .19$, partial $\eta^2 = .05$	.02, $p = .89$, partial $\eta^2 = .00$
Self-confidence	3.31, $p = .07$, partial $\eta^2 = .10$	.43, $p = .88$, partial $\eta^2 = .00$	.48, $p = .49$, partial $\eta^2 = .10$
Performance	1.23, $p = .28$, partial $\eta^2 = .04$	9.01, $p = .01$, partial $\eta^2 = .23$*	1.44, $p = .24$, partial $\eta^2 = .05$

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

4.5.3.3. Stress and Coping

Table 12 provides an overview of the frequency of reported stressors by the male and female participants in the experimental condition. Overall, no differences were found between the males and females in the total number of stressors reported ($\chi^2 = 1.00$, $p = .32$). Females, however, reported task execution ($\chi^2 = 4.84$, $p = .03$) significantly more frequently as a stressor than the males. Males again reported frequently outcome as a stressor ($\chi^2 = 3.81$, $p = .05$).

Table 12: The stressors reported by the females and males in the experimental stress condition in Experiment 3.

Stressors	Males experimental (n = 17)	Females experimental (n = 14)
Evaluation apprehension	5 (4)1 to 2 0.29	3 (1)1 to 1 0.21
Financial inducement	7 (5)1 to 2 0.41	4 (3)1 to 2 0.29
Putter	19 (9) 1 to 5 1.11	14 (8) 1 to 3 1
Goal endangerment	2 (2) 1 to 1 0.11	2 (1)1 to 1 0.12
Lack of concentration	1 (1) 1 to 1 0.06	3 (3) 1 to 1 0.21
Task execution*	28 (10) 1 to 5 1.64	36 (13) 1 to 5 2.57
Outcome*	37 (13) 3 to 5 2.17	22 (10) 1 to 5 1.57
Physical discomfort	3 (2) 1 to 2 0.17	3 (2) 1 to 2 0.21
Speak aloud	8 (4) 1 to 4 0.47	3 (2) 1 to 2 0.21
Total	6.43	6.38

Note: The first number represents the absolute frequency of the reported stressors with between brackets how many participants reported this stressor followed by the range. Finally, the relative frequency is reported (absolute number of reported stressors divided by the total number of participants from whom data were obtained). *$p \leq .05$.

Table 13 provides an overview of the frequency of reported coping responses by the male and female participants in the stress condition. No difference was found in the total number of coping strategies used ($\chi^2 = 1.00$, $p = .32$). Females, however, were found to use more emotion-focused coping strategies ($\chi^2 = 4.00$, $p = .05$), and in particular the positive self-talk strategy ($\chi^2 = 6.76$, $p = .01$). Males were found to use more avoidance coping strategies ($\chi^2 = 38.44$, $p < .001$) than the females. This was mainly due to males using external attributions. Although there was no gender difference for the problem-focused dimension ($\chi^2 = 0.04$, $p = .84$). Males tended to use more goal setting and females more technique ($\chi^2 = 15.62$, $p < .001$) oriented coping strategies.

Table 13: The coping strategies reported by the females and males in the experimental stress condition in Experiment 3.

Coping	Males experimental (n = 17)	Females experimental (n = 14)
Problem-focused coping		
Concentration	11 (6) 1 to 4 0.64	7 (6) 1 to 2 0.50
Goal setting	12 (7) 1 to 3 0.70	5 (4) 1 to 2 0.35
Planning	1 (1) 1 to 1 0.06	4 (2) 1 to 3 0.29
Take time	3 (2) 1 to 2 0.21	6 (5) 1 to 2 0.35
Technique*	42 (9) 1 to 7 2.47	48 (11) 2 to 8 3.43
Total PFC	4.06	4.28
Emotion-focused coping		
Acceptance	8 (4) 1 to 5 0.47	6 (4) 1 to 2 0.42
Positive self-talk*	29 (12) 1 to 5 1.70	41 (12) 1 to 8 2.92
Relaxation	1 (1) 1 to 1 0.06	-
Wishful thinking	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.07
Total EFC*	2.29	3.43
Avoidance coping		
Blocking	2 (2) 1 to 1 0.11	1 (1) 1 to 1 0.07
External attribution	8 (5) 1 to 2 0.47	1 (1) 1 to 1 0.07
Total AC*	0.59	0.14
Overall total	6.95	8.55

Note: The first number represents the absolute frequency of the reported coping strategies with between brackets how many participants reported this strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported coping strategies divided by the total number of participants from whom data were obtained). *$p < .05$.

Table 14 provides an overview of the coping preferences by the male and female participants in the experimental condition in relation to the stressors reported. Differences in coping preferences between the genders were particularly apparent for the stressors task execution and outcome. The females used more technique and positive self-talk coping strategies for both stressors whereas the males used more external attribution and goal-setting for the outcome stressor. However, females also used more positive self-talk for the physical discomfort and speak aloud stressors whereas the males used acceptance for the physical discomfort stressor.

Table 14: The stressors reported by the females and males in the experimental stress condition in Experiment 3 and the coping strategies utilised to deal with each stressor.

Stressors	Coping	Males experimental (n = 17)	Females experimental (n = 14)
Financial inducement	Technique	2 (2) 1 to 1 0.11	-
	Relaxation	1 (1) 1 to 1 0.06	-
	Blocking	2 (2) 1 to 1 0.11	1 (1) 1 to 1 0.07
Putter	Take time	-	2 (2) 1 to 1 0.14
	Technique	18 (6) 1 to 7 1.05	12 (5) 2 to 4 0.86
	Acceptance		1 (1) 1 to 1 0.07
	External attribution	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.07
Goal endangerment	Technique	2 (2) 1 to 1 0.11	-
	Positive self-talk	1 (1) 1 to 1 0.06	-
Lack of concentration	Concentration	2 (2) 1 to 1 0.11	1 (1) 1 to 1 0.07
	Technique	-	4 (3) 1 to 2 0.29
	Positive self-talk	2 (2) 1 to 1 0.11	-
Task execution*	Concentration	8 (4) 1 to 4	6 (5) 1 to 2

		0.47	0.42
	Goal setting	4 (4) 1 to 1 0.24	4 (3) 1 to 2 0.29
	Planning	1 (1) 1 to 1 0.06	4 (2) 1 to 3 0.29
	Technique	14 (5) 1 to 5 0.82	20 (5) 2 to 8 1.43
	Acceptance		2 (2) 1 to 1 0.14
	Positive self-talk	20 (6) 1 to 5 1.18	22 (6) 1 to 8 1.5
Outcome*	Concentration	1 (1) 1 to 1 0.06	-
	Goal setting	5 (3) 1 to 3 0.29	1 (1) 1 to 1 0.07
	Take time	3 (2) 1 to 2 0.17	4 (3) 1 to 2 0.29
	Technique	8 (4) 1 to 3 0.47	10 (4) 2 to 3 0.71
	Positive self-talk	3 (3) 1 to 1 0.17	9 (4) 1 to 3 0.64
	External attribution	4 (2) 2 to 2 0.24	-
Physical discomfort	Goal setting	3 (2) 1 to 2 0.18	-
	Technique	-	2 (2) 1 to 1 0.14
	Acceptance	7 (3) 1 to 4 0.41	2 (2) 1 to 1 0.14
	Positive self-talk	-	5 (3) 1 to 3 0.36
	Wishful thinking	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.07
Speak aloud	Acceptance	1 (1) 1 to 1 0.06	1 (1) 1 to 1 0.07
	Positive self-talk	-	5 (3) 1 to 3 0.36
	External attribution	3 (2) 1 to 2 0.18	-

Note: The first number represents the absolute frequency of the reported coping strategies with between brackets how many participants reported this strategy followed by the range. Finally, the relative frequency is reported (absolute number of reported coping strategies divided by the total number of participants from whom data were obtained). *$p < .05$.

4.5.4. Discussion

Experiment 3 investigated the effect of gender in the stress and coping process, during the execution of a novel complex motor task (golf putting) under normal and stressful conditions. However, this investigation addressed a limitation of Experiment 2 by assessing participants' control beliefs. Additionally, stress was induced by requiring participants to play for a cash prize and ego-threatening feedback was provided.

Results showed that the experiment was successful in inducing increased levels of stress in the participants as a significant increase in heart-rate, task completion time, and decrements in performance were found in the experimental compared to the control condition. No significant change was observed for the somatic or cognitive anxiety scale of the CSAI-2R. The absence of significant changes in self-reported cognitive anxiety and the decrement observed in performance in the experimental condition are not consistent with Experiment 2. A possible explanation for these diverse findings is the differences in stress manipulation. For example, the ego-threatening feedback was only provided after ten attempts and as such did not influence pre-performance anxiety levels.

When analyzing gender and stress appraisal, the results suggest that the males and females reacted similarly in terms of somatic anxiety, increased heart-rate, cognitive (cognitive anxiety, total number of reported stressors), behavioural (task completion time), self confidence levels, and performance (decrements in performance). Additionally, males and females did not differ in the levels of stress intensity or perceived control reported after the experiment. These findings suggest that the male and female participants did not differ in the intensity of stress experienced and control perceptions when performing in the experimental condition.

Similarly to Experiment 2, females reported task execution as a stressor significantly more often than males and the males reported outcome more often than the females. These differences are most likely related to differences in motivational orientation between males and females in achievement situations. That is, females are more likely to be task-orientated whereas males are more likely to be ego-orientated (e.g., Gilll, 1992; White & Duda, 1994).

Experiment 3 also found gender differences in coping at both the dimensional and strategy levels. In contrast to Experiment 2 females reported more emotion-focused (positive self-talk) and males more avoidance (external attribution) coping strategies. Differences in coping preferences between the genders were partially the result of males and females appraising the experimental situation differently in terms of stressor type reported. The females reported more technique coping and self-talk for the stressors task execution and outcome. The males, on the other hand, reported more external attribution for the stressor outcome. However, in contrast to Experiment 2 some differences were also observed for the stressors physical discomfort and speak aloud. The females used more positive self-talk for both stressors whereas the males used more acceptance and external attribution for the physical discomfort and speak aloud stressors, respectively. As such Experiment 3 provided partial support for the findings of Experiment 2. However, it appears that the manner in which stress is induced has an influence on the way males and females report the frequency of stressors and cope with the situation. There is some support for the finding that the females used more positive self-talk in this experiment. The meta-analysis by Tamres et al. (2002) found that females made more use of this emotion-focused coping strategy.

Although no differences were found in the total number of problem-focused coping strategies reported by the male and female participants, the females reported more technique coping than the males. This finding appears to be consistent with the

observation that the females were particularly stressed by the execution of the task and therefore implemented coping strategies to deal with this stressor. The use of positive self-talk and technique coping in the females and the use of external attribution in the males would support Zuckerman's (1979) observation that women are more inclined to attribute success to effort whereas men are more likely to attribute success to ability. External attribution is a convenient coping strategy for outcome oriented participants who do not achieve their expected goals.

Similar to Experiment 2 the current experiment found that males and females differ in the frequency of reported type of stressors. In addition, frequency of reported type of stressors appeared to be related to the coping preferences reported by the participants. However differences in coping preferences were also found between the genders for two additional stressors. Despite this, the personal significance attributed to stressors, which is influenced by biological and social factors (Taylor et al., 2000), could explain the gender differences in stressor type reported whereas differences in coping preferences are more likely the consequence of the different stressors type reported rather than gender per se. As such this experiment would also provide support for the situational hypothesis or role constraint theory.

4.6. General Discussion

The main objective of the present study was to examine whether males and females differ in their coping preferences when encountering a similar stressful situation. To this end, increased stress was successfully created in the participants using two different stress manipulations. Although the experimental situations resulted in a similar stress response in the male and female participants, there were significant and consistent differences in terms of the frequency of reported type of stressors across the experiments. Females reported being concerned with task execution and the males with

the outcome in Experiment 2 and 3. In addition, the females reported the putter more frequently as a stressor in the second experiment. Despite creating a similar stress situation for the participants the conditions were appraised differently in terms of stressor type selected by the male and female participants. It is believed that these differences in appraisal of the stressful situation between the genders are most likely the result of motivational orientation in achievement situations. The notion that males are generally more ego orientated and females more task orientated might explain why males and females differ in the frequency of reported type of stressors. It is unclear whether such differences in motivational orientation are the result of social or biological processes. However, the differences in the frequency of reported type of stressors provided an adequate explanation why the males and females reported some differences in coping preferences in this study.

Gender differences in stressor type experienced have been reported previously in the literature (Folkman & Lazarus, 1980). The results of the present study suggest that even in an experimentally controlled situation gender differences transpire in the personal significance attributed to stressors encountered. The adopted methodology was crucial in obtaining this information. Thinking aloud whilst executing a motor task allows the exploration of what participants experience to be stressful in a particular encounter in real time. Experiment 1 suggested that such a methodology is not detrimental to actual performance. This was supported in Experiments 2 and 3 in which most participants were not concerned by thinking aloud whilst executing the complex motor task of golf putting.

Researchers have used process-oriented research designs (e.g., ecological momentary assessment, daily diaries) intended to reduce the recall period because checklist approaches to coping measurement have been plagued by problems associated with unreliability of recall and retrospective bias (Coyne & Gottlieb, 1996; Folkman &

Moskowitz, 2004). With the passage of time people provide less accurate accounts of how they coped with a stressor (Ptacek et al., 1994b; Schwarzer & Schwarzer, 1996; Smith et al., 1999) and the knowledge about the success of efforts to resolve a situation might distort self-reported coping (Brown & Harris, 1978). Whereas these process-oriented approaches provide valuable information about appraisal and coping they still would not provide information about these processes during actual execution of a particular stressful task. The major strength of this study was that the participants' stressor-appraisals and coping preferences were assessed in real-time during execution of the complex motor task. A different methodology might have resulted in the premature conclusion that male and females differ in coping preferences without contemplating the frequency of reported type of stressors. The results of the present study however provide support for the notion that differences in the type of stressors reported are an important reason why male and female participants reported different coping strategies (Lee-Baggley et al., 2005).

Another strength of the present study was that coping was measured at both the dimensional and strategy level. Although males and females differed in coping at the dimensional level in this study, when analyzing coping strategies for each stressor type, it was found that males and females only varied in a small number of coping strategies and this was associated with stressor type selection. In this way, it is recommended that future research investigating gender differences in coping, measures coping at the strategy level for each stressor type reported by the males and females. In agreement with this suggestion Tamres et al. (2002) suggested that studies which have used broad higher order dimensions to investigate gender differences in coping might be limited by the notion that gender differences are only apparent in a small number of the coping strategies within such higher order dimensions.

There is currently no gold standard for the measurement of coping. Ecological approaches result in concrete descriptions, but this may miss reports of more complex, abstract problems and a broader conceptualization of coping that are better perceived with some retrospection (Folkman & Moskowitz, 2004). Thinking aloud protocols offer a promising avenue for stress and coping researchers. The fullest understanding of these processes will be achieved using a combination of methodologies and research designs.

In conclusion, Experiment 1 showed that the thinking aloud protocol can be used in assessing stress and coping whilst executing a complex motor task without decrements in performance. Experiments 2 and 3 demonstrated that males and females differed in the frequency of reported type of stressors. Gender differences in stressor type appraisal might be the result of social roles males and females play in society generally or sport specifically or biological factors. It is imperative that future research in the area of gender differences in coping controls for the type of stressor as well as its appraisal, and analyzes coping at the strategy level. The results of Experiments 2 and 3 suggest that variation in appraisal explains observed differences in coping preferences between the male and female participants rather than gender per se, providing tentative support for the situational hypothesis or role constraint theory.

Chapter 5: Study 3

Personality, Appraisal, Coping, and Coping Effectiveness in Sport

5.1. Abstract

This study investigated the influence of personality (The Big Five) on the appraisal of a self-selected stressor, coping, and perceived coping effectiveness among 482 athletes (male *n* = 305; female *n* = 177) from a variety of sports. Results showed that personality influenced coping selection, coping effectiveness, and the intensity of the stressors experienced and perceived control, but not the type of stressor reported. In particular, neuroticism predicted higher agreeableness, and lower intensity of stress experienced, and neuroticism predicted lower conscientiousness, and higher perceptions of control. Higher levels of neuroticism were associated with ineffective coping strategies in sport which were generally not perceived to be effective. The other four personality dimensions (agreeableness, conscientiousness, extraversion, openness to experience) were associated with more adaptive coping strategies which were perceived to be effective. In particular athletes high in neuroticism might be a concern for coaches. In addition, the results of the present study suggest that the life domain in which personality and coping is investigated might influence findings.

5.2. Introduction

It is well reported that athletes may experience a range of stressors (e.g., Anshel & Kassidis, 1997; Nicholls & Polman, 2007a). Inability to cope with these stressors has been associated with decrements in performance (Haney & Long, 1995), diminished satisfaction (Scanlan & Lewthwaite, 1984), increases in the probability of physical injury (Smith, Ptacek, & Smoll, 1992), burnout (Smith, 1986), and sport withdrawal (Klint & Weiss, 1986). The process by which an individual attempts to reduce the unpleasant feelings and emotions following experiencing stress is called coping (see section 2.1. for more detail). Personality has been considered a moderator factor that could influence each aspect of the stress-coping process (see section 2.3.3. for more detail). That is, personality may affect coping selection in a direct way, by restricting or assisting the use of specific coping strategies or in an indirect way by influencing the nature and appraisal of the stressors experienced or coping effectiveness (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005). Surprisingly, little is known about the influence of personality on appraisal and coping with stressors in sport. Indeed, a recent meta-analysis on this topic by Connor-Smith and Flachsbart (2007) did not contain any sport related studies.

Although there is continuing debate on the structure of personality, there is now some consensus on a general taxonomy of personality (Lee-Baggley et al., 2005). Based on lexical research (e.g., Goldberg, 1993, 1992) on the structure of personality, a five factor structure (The Big Five) has been shown to capture much of the variance in personality trait ratings (see section 2.3.3.1. for more detail). The Big Five provides a common framework in which the different and diverse systems of personality can be investigated. It represents personality at the broadest level of abstraction in which each dimension provides a number of more distinct personality characteristics (Costa & McCrae, 1995; John & Srivastava, 1999). The labels provided for the five personality

dimensions have shortcomings and are easily misunderstood (John & Srivastava, 1999) therefore a brief description of each is provided below. Neuroticism contrasts emotional constancy and even-temperedness with negative affectivity and includes traits like experiencing negative emotional states (feeling anxious, nervous, or tense), generation of irrational ideas and being impulsive and self-conscious. Extraversion implies an energetic approach towards the social and material world and is characterized by the tendency to experience positive emotions, being outgoing, warm, cheerful, active, and self-assured. Agreeableness contrasts a pro-social and communal orientation towards others with antagonism and is associated with being unselfish, compliant, trusting, modest and helpful. Conscientiousness depicts socially prescribed impulse control and assists task and goal directed behaviours. This includes characteristics like being purposeful in cognition and behaviour, organized, following rules and norms, delaying gratification, strong-minded and self-disciplined. Finally, openness to experience (vs. closed mindedness) refers to extensiveness, inventiveness and complexity of an individual's mental and experiential life and includes traits like being creative, inquisitive, having unconventional values, and flexible in their way of thinking (John & Srivastava, 1999). The Big Five dimensions have a biological-heritable basis and transcend individual differences like age, gender, race, and culture (Costa & McCrae, 1992; Lee-Baggley et al., 2005; McCrae et al., 2000).

5.2.1. Appraisal of the Situation and The Big Five

A number of mechanisms have been proposed by which personality might influence how individuals experience stress. Firstly, there is evidence that personality, through active choice or more involuntary inducement, can influence the type of situation which is perceived as being stressful as well as the frequency or probability of such encounters. There has been support for the differential exposure hypothesis (Suls & Martin, 2005). For example, individuals high on neuroticism experience more

negative events more frequently (Bolger & Zuckerman, 1995; Gunthert et al., 1999; Magnus et al., 1993; Ormel & Wohlfarth, 1991). Extraverts, on the other hand, report more positive events (Zautra et al., 2005) and higher levels of agreeableness have been associated with fewer social conflicts (Asendorph & Wilpers, 1998). Secondly, personality has been shown to result in differential appraisal. That is, personality results in individuals appraising specific events as more or less harmful or threatening (primary appraisal) and under or over-estimating their personal resources to cope (secondary appraisal) (Semmer, 2006; Suls & Martin, 2005). Indeed, Gunthert et al. showed that college students high in neuroticism reported higher levels of stress and reduced levels of confidence to cope with daily stressors. Thirdly, the differential sensitivity hypothesis (Suls & Martin, 2005) suggests that personality variables may influence the stress and coping process by reacting more or less strongly to negative events that are appraised in similar ways. Reactivity is the extent to which a person is likely to show emotional or physical reactions to a stressful event (Bolger & Zuckerman, 1995). The neuroticism/extraversion is based on the assumption that there are underlying physiological mechanisms which make individuals high on these traits react differently to negative or positive events (Eysenck, 1988; Larsen & Ketelaar, 1991). Individuals with high levels of neuroticism, in this respect, have been shown to 'magnify' the impact of negative events (Zautra et al., 2005) and show strong emotional and physiological reactivity to stress (Connor-Smith & Flachsbart, 2007). Conversely, extraverts have been characterized by an increased response to positive events and low stress reactivity (Connor-Smith & Flachsbart, 2007).

Previous research has demonstrated that the type and appraisal of the stressor interacts with personality to predict the coping strategies an individual employs (David & Suls, 1999; Suls & Martin, 2005). In addition, relationships between personality and

appraisal are assumed to be stronger for self-selected stressors than researcher selected stressors (Connor-Smith & Flachsbart, 2007).

5.2.2. Coping, Coping Effectiveness, and The Big Five

Personality not only plays an important role in the experience of stress but also in the way individuals cope with stress. That is, individuals with certain personality traits tend to use certain coping strategies more often than other people (Carver et al., 1989; Semmer, 2006). Such findings are not incompatible with Lazarus and Folkman's (1984) model of stress and coping. Hence, individuals will still take into account situational factors to modify their coping and will only show a tendency to use certain coping strategies more often in certain situations. Derryberry et al's., (2003) have suggested that these direct effects of personality on coping may begin in early childhood, with biologically based appetitive, defensive and attentional systems providing a framework for coping development. In other words, as suggested by Connor-Smith and Flachsbart (2007), personality may directly influence coping by withdrawal from threats, facilitating approach to rewards, and engagement or disengagement of attention. For example, the high energy and social ability of extraverts may promote the seeking of social support. Neurotics, on the other hand, might use more disengagement coping because of their sensitivity to threats (Connor-Smith & Flachbart, 2007).

Although research examining agreeableness and coping has been limited, a study by O'Brien and DeLongis (1996) found that individuals higher on agreeableness are likely to cope in ways that engage or protect social relationships such as seeking support and avoiding confrontation. They appear, on the other hand, less likely to use emotion-focused coping such as self-blame, wishful thinking or avoidance and disengagement coping (Hooker et al., 1994; Watson & Hubbard, 1996). The number of studies investigating the relationship between conscientiousness and coping is also

limited and the findings have not been consistent. High levels of conscientiousness have been associated with more planning and rational decision making (Chartrand et al., 1993; Vollrath et al., 1994), but less use of avoidant or emotion-focused coping such as self-blame (Hooker et al., 1994; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996). High levels of openness have been positively associated with increased emotion (McCrae & Costa, 1986; Roesch, Wee, & Vaughn, 2006), and problem-focused coping (Watson & Hubbard, 1996; Roesch et al., 2006), whereas some studies have found no significant association between openness and coping (e.g. Hooker et al., 1994).

Finally, personality traits may indirectly influence the effectiveness of coping strategies. Coping effectiveness refers to 'the extent to which the coping strategy, or combination of strategies, is successful in alleviating the negative emotions caused by stress' (Nicholls & Polman, 2007a; p. 15). When analyzing the effectiveness of coping, it is important to bear in mind that coping strategies are not universally beneficial or detrimental. There is an important difference between using a coping strategy and using it effectively (Suls & David, 1996). However, most research in the area of coping effectiveness suggests that reliance on problem-focused, rather than emotion-focused or avoidance coping strategies is related with more beneficial outcomes (Aldwin, 2007; Compas, Connor-Smith et al., 2001). However, coping strategies that are beneficial for some individuals may be less effective, or even harmful, for someone with different personality traits (Bolger & Zuckerman, 1995; DeLongis & Holzman, 2005).

Daily report studies have shown that high levels of neuroticism appear to be associated with poor coping outcomes (Holahan & Moos, 1987). Although those high on neuroticism might use coping strategies which are assumed to be effective like problem solving, the use of these strategies tends to be ineffective in the particular situation which they are coping with (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005). For example, individuals high in neuroticism tend to use more coping

strategies overall. This might indicate that they have difficulty in finding the most appropriate coping strategy for particular stressful events (Suls & Martin, 2005).

Individuals high on extraversion are said to be flexible copers who are able to adapt their coping response based on the situation (Lee-Baggley et al., 2005). As suggested by Lazarus and Folkman (1984) being flexible is considered to be an important prediction of good coping skills. Individuals high on conscientiousness have shown to be effective copers who adapt to the situation and cope effectively (Lee-Baggley et al., 2005; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

5.2.3. Current study

The current study is unique in that to date no studies have explored the relationship between The Big Five, stressor type, stressor appraisal, coping, and coping effectiveness in the sport domain. It is therefore unclear whether findings from other life spheres can be extrapolated to the realm of sport. As such this study will be part exploratory in nature, therefore directional hypotheses cannot be stated for all coping strategies. However, based on findings from mainstream psychology a number of a priori predictions have been formulated. Higher levels of neuroticism were predicted to influence the appraisal process and result in higher levels of stress intensity and lower levels of perceived control. In the instance of neuroticism, or any of the other four personality dimensions influence the appraisal process, this can consequently influence the choice of coping preferences. In such instance personality would act as a moderator variable between appraisal and coping. Secondly, it was predicted that the different personality dimensions would predict coping. In particular, participants higher in neuroticism were expected to use coping strategies aimed at minimizing stressful feelings and would therefore use more emotion-focused and avoidance coping strategies and less problem-focused coping strategies. As people high in openness are assumed to be flexible and creative copers, it was predicted that athletes high in this dimension

would try a number of coping strategies until they found the coping strategy that suited the demands of the stressful situation. As such, more emotion- and problem-focused coping strategies would be reported by these athletes. Participants high in extraversion (look for others in times of stress), and agreeableness (extensive social network to deal with stress) were predicted to seek support from others and use more problem-focused coping strategies. Finally, participants high in conscientiousness were predicted to use more problem-focused coping strategies like planning but less active coping.

With regard to coping effectiveness, it was predicted that higher levels of neuroticism would be associated with lower perceived coping effectiveness. In regards to the people high in openness, extraversion, agreeableness, and conscientiousness, it was predicted that coping strategies that were reported more frequently would also be rated as being more effective. Table 15 provides an overview of the expected relations between personality and coping at the strategy level.

Table 15: Expected relations between the five personality traits Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N), Openness (O), and Coping.

Coping strategies	E	A	C	N	O
Problem-focused coping strategies					
Active coping	+	?	-	-	+
Instrumental social support	+	+	+	-	+
Planning	+	+	+	-	+
Suppress competing activities	+	0	+	-	0
Increasing effort	+	0	+	-	+
Emotion-focused coping strategies					
Emotional social support	+	+		+	?
Humour	0	?	-	0	+
Venting emotions	0	-	-	+	0
Self-blame	0	-	-	+	?
Wishful thinking	-	-	-	+	+
Avoidance coping strategies					
Denial	-	-	-	+	0
Behavioural disengagement	-	-	-	+	0

Note: + = a positive correlation expected; - = a negative correlation expected; 0 = no relationship is expected;? = it is not possible to make a clear prediction.

5.3. Method

5.3.1. Participants

Participants were 482 UK based athletes (male *n* = 305; female *n* = 177) aged between 16 to 45 years (*M* age = 20.44 years, *SD* = 3.98), with experience in their sport from 1 to 35 years (*M* = 9.63, *SD* = 4.69). The sample consisted of sports performers competing at international (*n* = 15), national (*n* = 60), county (*n* = 220), and club/university (*n* = 175) levels. There were 12 missing entries. All of the participants were actively involved in competitive sport and had participated competitively within the last 14 days. The study was approved by a University's Research Ethics Committee and participants provided informed consent prior to participating.

5.3.2.Materials

Personality

The 44-item BFI (Big Five Inventory) measures the big five dimensions conscientiousness (C), agreeableness (A), neuroticism (N), openness (O), and extraversion (E) (see Appendix C). A five point rating scale was used ranging from 1 = *disagree strongly* to 5 = *agree strongly*. The BFI has been shown to have good psychometric properties with good reliability, retest reliability, factor structure and convergent and discriminant validity (Benet-Martinez & John, 1998; John & Srivastava, 1999). The reliability for the 5 factors in the present study was satisfactory (Cronbach's Alpha: .71 (O), .77 (A), 79 (N), .81 (C), and .82 (E). For this study the raw metric data were linearly transformed into a percentage of maximum possible (POMP). This means that the scores from the BFI were between 0 and 100. Such universal metric scores are more intuitive than scale scores with idiosyncratic ranges (Cohen, Cohen, Aiken, & West, 1999).

Stressor type and stressor appraisal

After completing the BFI participants reported the most intense sport stressor they had experienced in the previous 14 days. Following this, participants rated the level of stress intensity and control over the self-reported stressor using a horizontal visual analogue scale (see section 3.2. for details; scale provided on Appendix C). Note, in the present study control was measured over a stressful sport event without reference to the specific means of accomplishing control (Skinner et al., 1988; Weisz, 1986).

Coping and coping effectiveness

Coping was assessed at the strategy level by using the modified COPE (MCOPE; Crocker & Graham, 1995) (see section3.2. for details; scale provided in Appendix C). A 5-point Likert-type scale was added to the MCOPE to measure the perceived coping effectiveness of each strategy used. The 5-point scale was anchored at 1 = *extremely ineffective* and 5 = *extremely effective* (after Nicholls et al., 2006; Nicholls & Polman, 2007b). The Cronbach's Alpha for coping were low for three subscales (denial .60; suppression of competing activities. 68 and wishful thinking .66) and acceptable for the other scales (between .70 (active coping) and .86 (humour)). Similarly, Cronbach's Alpha for coping effectiveness were low for 3 subscales (suppression of competing activities .57; self-blame .64 and active coping .64) with the other scales being acceptable (between .70 (planning) and .84 (behavioural disengagement)). Although some of the scales of the MCOPE did not reach acceptable levels of internal consistency it was decided to include these in the statistical analysis. Hence, as previously stated by Billings and Moos (1981), one coping strategy might be adequate to relieve stress and as such would not require additional responses from either the same category or other categories of coping. Therefore, "psychometric estimates of internal consistency may have limited applicability in assessing the psychometric adequacy of measures of coping" (Billings & Moos, p. 145).

5.3.3. Procedure

Participants were recruited from sport clubs in the North of England during their competitive season. Clubs were contacted and asked whether they were interested in participating in the study. Following approval from the clubs and coaches, trained researchers visited clubs on training days. Before visiting the researchers made sure that the athletes had played sport competitively within the previous week. After reading the participant information sheet and providing consent, participants completed the questionnaire pack (see Appendix C) in the presence of a researcher.

In the present study the participants' responses were classified into seven stress categories: (a) injury, (b) error (technical/tactical), (c) outcome (not achieving performance goals), (d) performance (technique, fitness), (e) psychological (anxiety, confidence), (f) external factors (officials, opponent, environmental), (g) significant others (coach or team mates) (Gunthert et al., 1999). The researcher and the PhD supervisor independently coded a random sample of 50 participants. The two coders agreed on 47 of the 50 stressors (kappa = .93; $p < .001$). Following discussion of the cases in which there was disagreement, the researcher categorized the remainder of the stressors.

5.3.4. Data Analysis

First, data were screened for outliers and normality. Analysis of the normal probability plots from the regression standardized residuals suggested no deviations from normality. Scatter plots, Mahalanobis, and Cook's distance statistics indicated that none of the cases unduly influenced the results. Cronbach's alphas and descriptive statistics for all study variables were then calculated. Following this, correlations between the variables were calculated (see also appendix E for steps undertaken to assure that the data did not violate assumptions). To investigate whether personality was associated with self-reported stressor type, ratings of stress intensity and perceptions of control three regression analyses were conducted. Stressor type, stress intensity, and

perceived control were the dependent variables and the five personality scales (E, A, C, N, O) the predictor variables.

The association between coping, coping effectiveness, and personality was investigated using correlational analysis and hierarchical regression analysis. The regression analysis controlled for gender, stress intensity, perceived control, and stressor type. The 12 coping strategies of the MCOPE were the dependent variables. At step one gender, stress intensity, perceived control, and stressor type were entered, whilst at step 2 the five personality scales were entered (E, A, C, N, O). The main aim of the present study was to assess whether personality predicted the selection of coping strategies and self-ratings of coping effectiveness above and beyond the variance explained by gender, stress intensity, perceived control, and stressor type. This study therefore was interested in the additional variance (ΔR^2) explained by personality whilst controlling for gender, stress intensity, perceived control, and stressor type.

In the instance of personality influencing the appraisal process moderated multiple regression analyses were conducted (Aiken & West, 1996) to investigate whether personality moderated the relationship between either stress intensity or control and coping. To reduce the number of statistical tests conducted and thus Type I errors potential moderator effects were only assessed for those personality dimensions which predicted stress intensity or control and coping strategies. Prior to analysis the continuous variables were centered by subtracting the sample mean of the variables obtaining a sample mean of zero. At step one the centered variables stress intensity or control were entered. In addition, the relevant centered personality dimensions were entered. At the second step the interaction between either stress intensity or control and the personality variables were entered (product term of the multiplication of the centered predictor stress intensity or control and the moderator personality). The F test, representing the stepwise change in variance explained as a result of the addition of the

product term, is an indicator of the significance of the moderator effects. Interaction effects were explored by plotting predicted values for the outcome variables (coping strategy) at mean, low (-1 SD from the mean) and high (+1 SD from the mean) level of either stress intensity or perceived control (Frazier, Tix, & Barron, 2004).

5.4. Results

Table 16 provides the means and standard deviations for the coping strategies and for coping effectiveness. The mean for stress intensity was $M = 6.23$, $SD = 2.38$ and for perceived control $M = 5.55$, $SD = 2.76$. Table 16 provides the correlations between the five personality scales, appraisal, coping, and coping effectiveness. The mean and standard deviations, in POMP units, for the personality scales were as follows: Extraversion $M = 66.73$, $SD = 16.60$; Agreeableness $M = 69.83$, $SD = 11.55$; Conscientiousness $M = 55.46$, $SD = 13.60$; Neuroticism $M = 42.72$, $SD = 18.37$; Openness $M = 57.90$, $SD = 12.93$.

The regression analysis for stress intensity was significant ($R^2 = .06$, $p < .001$). Higher levels of neuroticism ($\beta = .26$; $p < .001$) were associated with increased levels of stress intensity, and higher levels of agreeableness ($\beta = -.10$; $p < .05$) with lower levels of stress intensity. The regression analysis for perceived control was also significant ($R^2 = .04$; $p < .001$) with higher levels of neuroticism ($\beta = -.21$; $p < .001$) predicting lower perceptions of control and higher levels of conscientiousness ($\beta = .09$; $p < .05$), predicting higher levels of perceived control. The other personality scales did not predict stress intensity or perceived control. The personality traits did not predict the selection of stressor type ($R^2 = .01$; $p = .79$).

As expected the different personality traits had different influence on coping, and coping effectiveness. The correlational analysis (see Table 17) provided support for most a priori predictions. In particular, all correlations were in the predicted direction

except for extraversion and active coping and denial, conscientiousness and seeking emotional social support, and neuroticism and active coping. Low non-significant correlations were obtained for all instances where no relationship was expected or no explicit prediction could be made. On the whole, and in line with the transactional model of stress and coping (Lazarus, 1999), most of the correlations were low to moderate in magnitude.

Table 16: Mean and standard deviation for each of the coping strategies and coping effectiveness.

	Coping	Coping Effectiveness
Problem-focused coping strategies		
Active coping	3.20 (0.52)	3.03 (0.55)
Instrumental social support	2.83 (0.98)	2.76 (0.67)
Planning	3.22 (0.83)	2.92 (0.59)
Suppress competing activities	3.07 (0.85)	2.81 (0.56)
Increasing effort	4.01 (0.79)	3.28 (0.57)
Emotion-focused coping strategies		
Emotional social support	2.67 (1.00)	2.65 (0.74)
Humour	2.35 (1.10)	2.31 (0.83)
Venting emotions	2.31 (0.99)	2.30 (0.76)
Self-blame	2.84 (0.96)	2.50 (0.65)
Wishful thinking	2.85 (0.93)	2.32 (0.66)
Avoidance coping strategies		
Denial	2.14 (0.78)	2.19 (0.74)
Behavioural disengagement	1.72 (0.80)	2.16 (0.92)

Table 17: Correlations between the five personality traits Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N), Openness (O) and coping (CO), coping effectiveness (CE), stressor intensity and stressor control.

		E	A	C	N	O
Problem-focused coping strategies						
Active coping	CO	-.06	-.06	-.36**	.32**	.03
	CE	.14**	.05	.08	-.18**	.06
Instrumental social support	CO	.19**	.10*	.13**	-.10*	.11*
	CE	.08	.16**	.10*	-.08	.10*
Planning	CO	.18**	.04	.16**	-.19**	.17**
	CE	.12*	.12*	.18**	-.21**	.14**
Suppress competing activities	CO	.12**	-.04	.09	-.12**	.07
	CE	.09*	-.01	.05	-.10*	.03
Increasing effort	CO	.20**	.06	.10*	-.23**	.08
	CE	.18**	.07	.05	-.23**	.01
Emotion-focused coping strategies						
Emotional Social support	CO	.15**	.10*	.14**	.01	.06
	CE	.08	.14**	.10*	.00	.06
Humour	CO	.09	-.04	-.16**	-.03	.10*
	CE	.00	.03	-.06	-.04	.04
Venting emotions	CO	-.04	-.24**	-.13**	.20**	.02
	CE	.04	-.01	.00	-.03	-.01
Self-blame	CO	.01	-.16**	-.09*	.08	.03
	CE	.04	-.05	.08	-.09	.05
Wishful thinking	CO	-.02	-.13**	-.16**	.17**	.09
	CE	.05	-.03	-.10*	.05	.03
Avoidance coping strategies						
Denial	CO	.03	-.05	-.13**	.02	.06
	CE	-.08	.02	-.08	.01	.02
Behavioural disengagement	CO	-.03	-.10*	-.10*	.23**	.00
	CE	-.10*	.05	-.08	.07	.01
Appraisal						
Stressor intensity		.00	-.16**	-.08	.22**	-.03
Stressor control		.07	.04	.10*	-.21**	-.03

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

The results of the stepwise linear regression analysis for establishing whether personality predicted the use of coping strategies, and coping effectiveness, whilst controlling for gender, stress intensity, perceived control, and stressor type are shown in Table 18. As expected neuroticism was associated with less problem-focused coping (planning, increasing effort, and suppression of competing activities), but more emotion-focused (venting emotions and wishful thinking), and avoidance coping (behavioural disengagement). However, increasing levels of neuroticism also predicted the use of more active coping. As expected, higher levels of extraversion were associated with increased seeking of informational and emotional social support as well as increasing effort. Agreeableness did not predict seeking informational or emotional social support. However, agreeableness was associated with increased use of active coping, and decreased use of planning, venting emotions, and self-blame. As expected conscientiousness was associated with more planning and suppression of competing activities, and less active coping, humour and wishful thinking. However, contrary to predictions increased levels of conscientiousness predicted the use of more seeking emotional social support. Finally, higher levels of openness predicted increased planning, and wishful thinking.

As expected, participants high in neuroticism rated the problem-focused coping strategies active coping, planning, and increasing effort as less effective but the emotion-focused coping strategy wishful thinking as more effective. Increased levels of extraversion were associated with reporting increasing effort as more effective. Participants higher in agreeableness rated seeking informational social support and behavioural disengagement as more effective. Both increased levels of openness and conscientiousness were associated with higher coping effectiveness scores for planning whereas higher levels of conscientiousness were also associated with lower coping effectiveness scores for behavioural disengagement, and wishful thinking.

Table 18: Results of the regression analysis for coping and coping effectiveness whilst controlling for gender, stress intensity, perceived control and stressor type at step 1.

Coping strategy	ΔR^2	Coping Significant predictors	ΔR^2	Coping Effectiveness Significant predictors
Problem-focused coping strategies				
Active coping	.21**	A, Beta = .11; C, Beta = -.39; N, Beta = .27	.04**	N, Beta = -.17
Seeking informational social support	.05**	E, Beta = .12	.03*	A, Beta = .11
Planning	.09**	A, Beta = -.12; C, Beta = .12; O, Beta = .16; N, Beta = -.22	.07**	C, Beta = .11; O, Beta = .13; N, Beta = -.19
Suppression competing activities	.03 *	C, Beta = .10; N, Beta = -.12	.01 ns	
Increasing effort	.07**	E, Beta = .13; N, Beta = -.21	.07**	E, Beta = .13; N, Beta = -.20
Emotion-focused coping strategies				
Seeking emotional social support	.03**	E, Beta = .11; C, Beta = .10	.04ns	
Humour	.04*	C, Beta = -.17	.00 ns	
Venting emotions	.07**	A, Beta = -.17; N, Beta = .19	.00 ns	
Self-blame	.03*	A, Beta = -.11	.01ns	
Wishful thinking	.06**	C, Beta = -.13; N, Beta = .16; O, Beta = .11	.03*	C, Beta = -.12; N, Beta = .13
Avoidance coping strategies				
Denial	.02 ns		.02ns	
Behavioural disengagement	.05**	N, Beta = .23	.04*	A, Beta = .12; C, Beta = -.12

*$p < .05$; ** $p < .01$; ns = not significant.

Moderation analysis for stress intensity and coping only provided significant interactions for behavioural disengagement and venting emotions (see Table 19).

Table 19: Results of the moderated multiple regression analysis.

Step and variable	B	Beta	R^2	ΔR^2
Dependent variable: Behavioural disengagement	0.03	.10	.06**	
Step 1: Stress intensity	0.01	.21**		
Neuroticism	0.002	.13**		.02**
Step 2: Stress intensity * Neuroticism				
Dependent variable: Venting emotions				
Step 1: Stress intensity	0.09	0.21**	.07**	
Neuroticism	0.01	0.16**		
Step 2: Stress intensity * Neuroticism	0.004	0.16**		.03**

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

Figures 3 and 4 suggest that individuals high in neuroticism use more behavioural disengagement and venting emotions at higher levels of stress whereas individuals low on neuroticism had a tendency to use less of these coping strategies at high levels of stress.

Figure 3: Result of the interaction effect for the moderation effect of neuroticism on the relationship between stress intensity and the behavioural disengagement coping strategy.

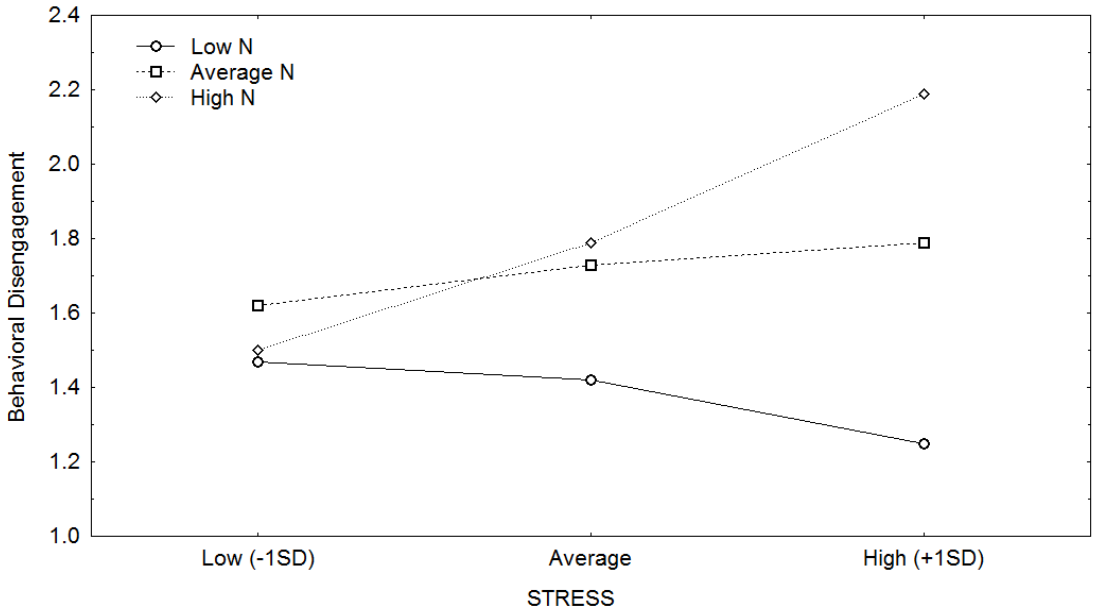
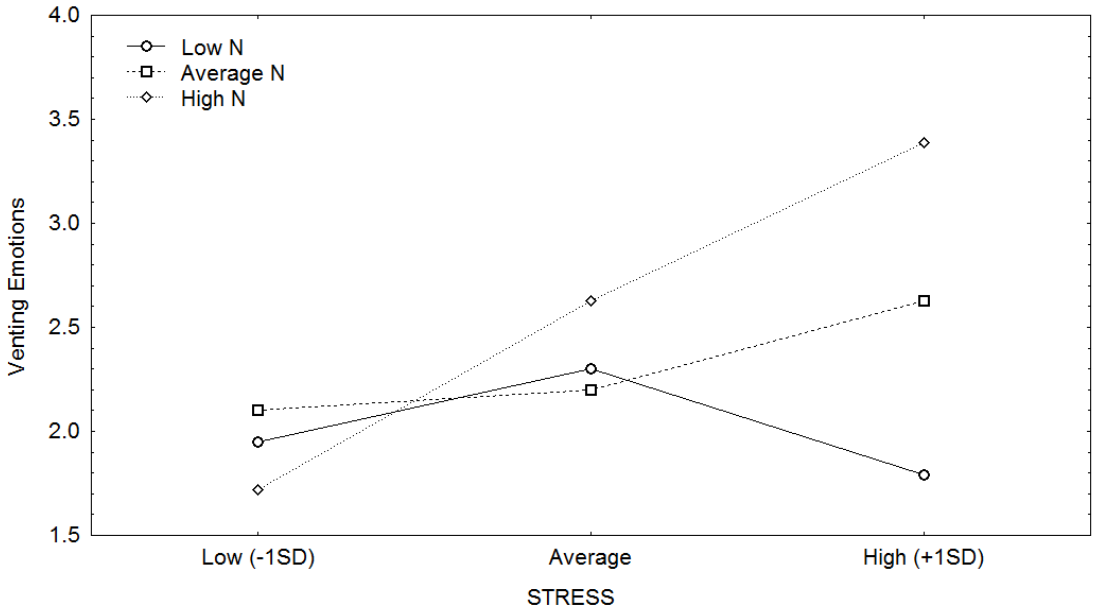


Figure 4: Result of the interaction effect for the moderation effect of neuroticism on the relationship between stress intensity and the venting emotions coping strategy.



5.5. Discussion

The purpose of this study was to examine the relationship between The Big Five personality dimensions and appraisal, coping, and coping effectiveness in relation to a self-selected stressor in sport. Findings revealed an association between neuroticism, agreeableness, conscientiousness and stress appraisal. Furthermore, all five personality dimensions were shown to be a predictor of coping and coping effectiveness.

5.5.1. Appraisal of the Situation and The Big Five

The present study supported previous research findings and the a priori prediction that athletes high in neuroticism would show increased levels of stressor intensity for the self-selected stressor (e.g., Bolger & Zuckerman, 1995). In addition, and in accordance with the a priori prediction athletes high in neuroticism experienced less perceived control over the self-selected stressor. A possible explanation for the results may be that people high in neuroticism would intensify the degree of threat perceived by undesirable events (i.e., primary appraisal), resulting in experiencing increased stress intensity, and underestimate their personal resources (secondary appraisal) to cope with the event resulting in lower perceptions of control over the situation (Gunthert et al.,1999). The results, however, cannot establish whether this is due to individuals high in neuroticism appraising similar events differently or because of differential sensitivity to stressors. The former suggests that higher levels of neuroticism exaggerate the threat posed by the stressful events through primary appraisal (Zautra et al., 2005) whereas the latter suggests that individuals high in neuroticism are more sensitive to negative stimuli either through biological or learning differences. In particular, neurotics have been proposed to be high in the behaviour inhibition system (BIS; Gray, 1987). This motivational system with brain substrates is said to result in greater sensitivity to negative stimuli. There is some evidence to suggest that those high in neuroticism respond with more negative affect over and above the

negative appraisal of stressful events (Gunthert et al., 1999). Future research, therefore, could take into consideration baseline mood or affective states and establish whether these moderate the relationship between neuroticism and stressor appraisal.

Whereas neuroticism has been associated with over-reactivity to stressful events in most life domains agreeableness appears to be only related to increased stress reactivity to interpersonal conflicts. Such conflicts would increase stress because individuals high on agreeableness would like to preserve positive interactions (Suls, Martin, & David, 1998). Agreeableness in the present study was associated with lower levels of stress intensity. This finding might be partially explained by the characteristics attributed to this personality dimension and the life domain in which it was investigated. Individuals high in agreeableness are likely to be trustful, cooperative and compliant, and therefore might perceive the typical acute stressful situations encountered in sport as causing less distress (e.g., bad decision by the official). Similarly, there were only a few athletes who reported interpersonal conflict as an acute stressor in the present study. This could suggest that personality could influence primary appraisal differentially depending on the domain examined.

Conscientiousness was found to be associated with higher perceptions of control in the present study. Individuals high in this dimension are said to be purposeful and strong minded. These traits could explain why they perceived their stressors as more controllable. To date no study has investigated the relationship between personality and perceptions of control. However, this is an important issue because perceptions of control appear to be inversely related to stress intensity (Kaiseler, Polman, & Nicholls, *under review*) and might influence the selection of coping strategy (Lazarus & Folkman, 1984). As such, higher levels of perceived control over the event might result in reduced stress levels and selection of more adaptive problem-focused coping strategies whereas lower levels of control might result in increased stress and the use of more maladaptive

emotion-focused or avoidance coping strategies. Also, in a study by Zakowski et al. (2001) higher levels of perceived control were associated with the use of more problem-focused coping strategies but less emotion-focused coping strategies providing support for the goodness-of-fit hypothesis.

The moderation analysis provided some support for the notion that personality can influence coping indirectly via the appraisal process. In particular, individuals high in neuroticism were found to use more behavioural disengagement and venting of emotions at high levels of stress whereas individuals low on this personality dimension tended to use less of these coping strategies at high levels of stress.

Most research in mainstream psychology has focused on neuroticism. The results of the present study extend the current literature and suggest that other dimensions of the Big Five can also influence the appraisal process but that this might be dependent on the specific life domain in which this is investigated. Although the present study did not find that personality predicted type of stressor it is possible that certain individuals high in personality dimensions experience stressors more frequently (e.g., Bolger & Zuckerman, 1995) but further research is required to establish whether this is also the case in the sport domain.

5.5.2. Coping, Coping Effectiveness and the Big Five

The correlational and regression analysis provided support for most of the a priori predictions with regards to personality and coping. Contrary to predictions, neuroticism was positively associated with active coping but this was rated to be an ineffective coping strategy. Individuals high in neuroticism have been found to use more problem-focused coping but the strategies they employ have either been ineffective to the particular situation which they are coping with or they have difficulty in finding the right strategy (DeLongis & Holtzman, 2005; Suls & Martin, 2005). In this respect, the results of the present study provide support for the notion that neuroticism is

associated with immature coping strategies with higher levels on this dimension being associated with less use of the problem-focused coping strategies planning, increasing effort, and seeking instrumental social support, but more use of the emotion-focused, and avoidance coping strategies denial, venting emotions, self-blame, wishful thinking, and behavioural disengagement. Also, the results with regard to coping effectiveness supported those in other life domains (e.g., health and relationships). Higher levels of neuroticism were associated with lower coping effectiveness scores for planning, active coping, and increasing effort but a higher coping effectiveness score for the maladaptive coping strategy wishful thinking.

Athletes high in neuroticism appear to use ineffective coping strategies with poorer outcomes (Roesch et al., 2006; Vollrath & Togersen, 2000). Together with the increased levels of distress and lower levels of perceived control athletes high in neuroticism would be a potential concern for coaches. This personality type appears to be less than optimal for performance, and might also be a precursor of drop-out from competitive sport. Suls and Martin (2005) have proposed the neurotic cascade in which hyper-reactivity to stressful events, frequency of stressful encounters, differential appraisal, negative emotional spill over, and failure to use appropriate coping strategies lead individuals high in neuroticism to experience recurrent incidences of negative affect. Longitudinal, prospective studies are required to investigate whether participation in competitive sport might be associated with such a negative cascade or whether the positive psychological aspects inherent with being physically active might alleviate negative affectivity.

As expected athletes scoring high in extraversion used more seeking instrumental and emotional social support (Amirkham, Risinger, & Swickert 1995; Fickova, 2001; Hooker et al., 1994). Also, small significant positive correlations were found between extraversion and suppression of competing activities and planning

(Hooker et al., 1994; McCrae & Costa, 1986). Contrary to predictions, extraversion was not associated with active coping, although this was reported to be an effective strategy. A number of the stressor categories in the present study make it difficult for athletes to use active coping. For example, a wrong call by the referee or injury is probably best dealt with by using emotion or avoidance coping strategies. In support of this idea Richards (2004) suggested that avoidance coping is likely to be an effective and efficient strategy to be used in the sport setting. As such the sport domain might not allow individuals high in extraversion the opportunity to actively approach a number of stressful events. Most of the correlations between extraversion and coping effectiveness were positive with the exception of behavioural disengagement and denial. Extraverts have been found to be effective and active copers, they use a variety of coping strategies in an effective manner (Lee-Baggley et al., 2005; Newth & Delongis, 2004). The present study partially supports this. However, not all coping strategies were perceived to be effective. This study cannot compare findings with other sport related studies but as suggested previously, there appear to be sport specific constraints that influence the selection of coping strategies and their effectiveness which might be different from other life domains.

Agreeableness was, as predicted, positively correlated with instrumental and emotional social support (which were also perceived to be effective coping strategies), and negatively with wishful thinking. Agreeableness also predicted increased use of active coping, but less use of planning, venting emotions, and self-blame. These findings are consistent with previous research. Individuals high in agreeableness are more likely to cope in ways that engage or protect social relationships such as seeking support (Hooker et al., 1994; O'Brien & DeLongis, 1996), and appear less likely to employ emotion-focused strategies such as self-blame (Lee-Baggley et al., 2005; O'Brien & DeLongis, 1996), or disengagement (Watson & Hubbard, 1996). These

coping strategies appear to be effective to the sport context. For example, previous research has shown that active coping and getting advice were effective strategies used by elite rugby union athletes (Nicholls et al., 2006; Nicholls & Polman, 2007b).

In agreement with predictions athletes high on conscientiousness used more problem-focused coping (planning, effort, and seeking instrumental social support), except for active coping, and used less avoidance and maladaptive emotion-focused coping strategies such as self-blame, denial and wishful thinking. With regard to coping effectiveness, conscientiousness was negatively associated with wishful thinking, and positively associated with the problem-focused coping strategies seeking instrumental social support, and planning. However, contrary to expectations conscientiousness was positively correlated with the use of seeking emotional social support, and this strategy was also perceived as being effective in the sport context. The coping strategies used and perceived as effective by athletes high on this dimension support previous findings suggesting that individuals high on this dimension are careful planners, and rational decision-makers when they encounter a stressor (Chartrand et al., 1993; Hooker et al., 1994). In addition, they are less likely to engage in avoidant, emotion-focused coping such as self blame (Hooker et al., 1994; O'Brien & DeLongis, 1996). Athletes higher in conscientiousness appear to be effective copers who adapt to the demands of the situation, and respond in appropriate ways (Lee-Baggley et al., 2005; O'Brien & DeLongis, 1996; Watson & Hubbard, 1996).

In agreement with expectations and previous research openness was positively correlated with problem-focused coping (planning and seeking instrumental social support) (Watson & Hubbard, 1996), and humour (McCrae & Costa, 1986; Roesch et al., 2006). The characteristics associated with openness would allow those higher in this personality dimension to be flexible in the use of coping strategies. This might result in the relatively few associations between openness, coping, and coping effectiveness in

the present study. The present findings provide some support for the notion that those higher on openness are adaptive, flexible copers who do not appear to have a preference for specific coping strategies (Lee-Baggley et al., 2005).

As suggested by Nicholls and Polman (2007a) in their systematic review, to date only scant research has been conducted on the relationship between personality characteristics, coping, and coping effectiveness in the sport domain. The present study in this respect provides an original contribution to the literature and suggests that the Big Five personality dimensions have a small direct effect on coping as well as an effect on the appraisal process. The findings that most associations between the Big Five personality dimensions and coping were low to moderate in magnitude provide support for Lazarus's (1999) cognitive-motivational relational theory of stress and coping. This theoretical model views coping with stress as a dynamic and recursive process which varies from situation to situation and would predict that personality would only have a small to moderate effect on coping.

The mean values obtained for the five personality dimensions in the present study appeared to deviate from those previously reported by Srivastava, John, Gosling, and Potter (2003), in their internet sample of 132,515 participants. A one sample t-test found that the athletes in the present study scored significantly ($p < .001$) lower on conscientiousness (63.8 vs. 55.46), neuroticism (51.0 vs. 42.75), and openness (74.5 vs. 57.90), and significantly higher on extraversion (54.6 vs. 66.73), and agreeableness (66.4 vs. 69.83). These findings provide some support for the notion that certain personality dimensions are more likely to gravitate towards sport participation. In addition, the direction of these differences appears to be consistent with the situational constraints inherent in competitive sport participation. For example, competitive sport may allow sufficient stimulation for those high in extraversion but by the same token has an organizational structure which might not allow sufficient novel experiences for

those high in openness. Similarly, people high in neuroticism may perceive sport competition as a stressful experience and therefore would be less likely to participate.

This study is the first to investigate the role of the Big Five on appraisal, coping and coping effectiveness in sport and as such provides an original contribution to the literature. Also, this study addressed some of the limitations of the past literature by having participants report a self-selected stressor, and controlling for the appraisal of this stressor in terms of intensity and perceived control (Connor-Smith & Flachsbart, 2007). In addition, the current study investigated the effects of personality on both coping, and coping effectiveness. The present study also has a number of limitations which are associated with the notion that the study is cross-sectional in nature and cannot be used therefore to infer causality and was retrospective in nature. Also, the data obtained were self-reported and were only collected from competitive athletes, limiting generalizability. In addition, this study only assessed how individuals coped with one specific stressful event and did not control for possible baseline differences in stress reactivity.

In conclusion, the current study found support for the notion that in sport, personality (Big Five) affects coping selection directly and has an effect on the appraisal process, coping and coping effectiveness. The neuroticism dimension was found to be associated with heightened stress, lower perceptions of control, use of maladaptive coping strategies, and reduced coping effectiveness. This personality dimension appears to be less suitable for competitive sport. The other four personality dimensions were related to the use of more adaptive coping strategies which were rated as effective. As such these personality dimensions might be more suitable for achieving high performance levels in competitive sport. Although it is difficult to invoke changes in personality dimensions it would be much more practical to modify aspects of appraisal, reactivity and coping.

CHAPTER 6: STUDY 4

Mental Toughness, Stress, Stress Appraisal, Coping, and Coping Effectiveness in Sport

6.1. Abstract

The aim of the present study was to investigate the relationship between mental toughness, stressor appraisal, coping, and coping effectiveness among a sample of athletes. Participants were 482 athletes (male n = 305; female n = 177), aged between 16 and 45 years (M age = 20.44 years, SD = 3.98). In support of a priori predictions, mental toughness was associated with stress intensity and control appraisal, but not the type of stressor experienced by athletes. Total mental toughness and its six components predicted coping and coping effectiveness in relation to the self-selected stressor. In particular, higher levels of mental toughness were associated with more problem-focused coping, but less emotion-focused and avoidance coping. The problem-focused coping strategies were used more often and were also perceived to be more effective. In contrast, emotion-focused coping and avoidance coping were less used and not perceived as effective. These findings suggest that coping effectiveness was influenced by the coping strategy employed by the athletes.

6.2. Introduction

This study investigated the relationship between mental toughness, stress appraisal, coping, and coping effectiveness in the context of sport. Most research concerning mental toughness in sport has been exploratory in nature, whereby researchers have explored athletes' understanding of this construct (e.g., Jones et al., 2007). However, such research has failed to utilize existing psychological theory (Gucciardi et al., 2009). An exception has been the work of Clough et al. (2002) who conceptualized mental toughness using both the athlete's perspective and established psychological theory. Mental toughness in their view is a trait like construct that shares similarities with hardiness (Kobassa, 1979). Hardiness is characterized by three main components: *control* of various life situations; *commitment,* being when one tends to involve him/herself in the action they are doing; and *challenge*, the extent to which individuals see challenges as opportunities. Based upon their research, Clough et al. extended the work of Kobassa, and added a fourth factor: *confidence*. This addition is consistent with the extant literature on mental toughness (see section 2.3.3.2. for more detail), which suggests that self-confidence and the belief in one's ability is considered the most important characteristic of mental toughness in sport (e.g., Gucciardi et al., 2009; Jones et al., 2007). Clough and colleagues (Clough et al., 2002; Crust & Clough, 2005; Levy, Polman, Clough, Marchant, & Earle, 2006) have used their mental toughness Questionaire 48 (MTQ48; Clough et al., 2002) to assess an individual's total mental toughness and the four sub-components: control (emotional and life), commitment, challenge and confidence (interpersonal and abilities) (see section 2.3.3.2. .1. for more detail).

Coping has been defined as "a constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141) (see

section 2.1. for more detail). Personality has been considered a moderator factor that could influence each aspect of the stress-coping process (see section 2.3.3. for more detail). As such, mental toughness could affect coping selection in: (a) a direct way by restricting or assisting the use of specific coping strategies or (b) in an indirect way by influencing the type and intensity of the stressors experienced or coping effectiveness (Bolger & Zuckerman, 1995).

To date only one study has investigated the relationship between mental toughness and coping among athletes. Nicholls et al. (2008) found that higher levels of mental toughness were associated with strategies that would be classified as problem-focused coping, but less avoidance and emotion-focused coping strategies. Nicholls et al. did not consider the type of stressor or how stressors were appraised by the athletes. Nor did their study investigate the effectiveness of different strategies in relation to mental toughness.

The personality literature suggests that certain traits influence the type of situations that are perceived as being stressful as well as the appraisal of the stressor. For example, neurotic individuals are more likely to experience interpersonal stressors and appraise situations with higher levels of stress reactivity and negative affect (Suls & Martin, 2005). Based on the conceptualization of mental toughness it could be predicted that individuals high in mental toughness would perceive stressful events as a challenge, something that can be influenced and acted upon, and see themselves capable of doing so. Mental toughness would also be associated with more emotional stability when experiencing a stressful event (Horsburgh et al., 2009). This suggests that mentally tough individuals appraise stressful events with lower levels of stress intensity and with higher perceptions of control over the event. However, to date no research has been conducted to support this contention.

A number of qualitative studies have suggested that mentally tough athletes cope more effectively than less mentally tough athletes (Jones et al., 2007; Thelwell et al., 2005). Indeed, the six professional soccer players in the Thelwell et al. study felt that being mentally tough always helped them to cope more effectively. However, it is unclear whether mentally though athletes cope more effectively as a consequence of experiencing dissimilar stressor types, interpreting these stressors in a different way (e.g., stress intensity variations or different perceptions of control over the event), use different coping strategies, or use the same coping strategies, but more effectively than athletes who are less mentally though.

The present study investigated the relationship between mental toughness and appraisal (stressor intensity and perceived control over the stressor) of a self-selected stressor, coping strategies, and coping effectiveness in sport. Adopting the framework of Lazarus and Folkman (1984) coping was viewed as being situation specific. As such any personality trait, including mental toughness, would only be expected to correlate low to moderately with coping and coping effectiveness (Bolger & Zuckerman, 1995). Based on the study by Nicholls et al. (2008) it was predicted that higher levels of mental toughness would be associated with more problem-focused coping, and these strategies would be perceived as effective. It was also predicted that athletes who scored higher in mental toughness would use less emotion-focused and avoidance coping strategies. Also, emotion-focused and avoidance coping strategies would be rated as being less effective by more mentally tough athletes. Based on the conceptualization by Clough et al. (2002), it was predicted that a higher level of mental toughness would be associated with reduced stress intensity and higher levels of perceptions of control. A prediction with regard to the type of stressor experienced was not made.

6.3. Method

6.3.1. Participants

Sample is the same as study 3 (see section 5.3.1).

6.3.2. Materials

The MTQ48 (Clough et al., 2002), a 48 item questionnaire that assesses total mental toughness and its six subcomponents: challenge, commitment, interpersonal confidence, confidence in own abilities, emotional control, and life control was the first questionnaire completed by all participants (see section 2.3.3.2. for more detail about the MTQ48; see questionnaire on Appendix D). The items are rated on a 5-point Likert scale anchored at 1= *Strongly disagree* to 5 = *Strongly agree.* The MTQ48 in the present study had an overall Cronbach Alpha value of .92. Five of the subscales of the MTQ48 had acceptable Alpha values (α between .69 and .80) with the exception of emotional control (α = .55), which suggests some unreliable items. Alpha coefficients following iterative deletion of items were recalculated. Deletion of items 26 and 34 resulted in an improved value (α = .68). The psychometric properties of the MTQ48 have recently been shown to be adequate (Horsburg et al., 2009). In addition, a number of studies have provided support for the predictive, face, construct, and criterion validity of the MTQ48 (e.g., Clough et al., 2002).

After completing the MTQ48 participants reported the most intense sport stressor they had experienced in the previous 14 days. Participants then indicated how they appraised each stressor by dissecting a 10 cm bipolar line anchored by two statements (‘*not at all stressful’* vs. *‘extremely stressful’* and *‘no control at all’* versus *‘full control’*) (see section 3.2. for details; scale provided on Appendix D). In the present study control was measured over a stressful sport event without reference to the specific means of accomplishing control (Skinner et al., 1988).

The MCOPE, was used to measure coping (see section 3.2. for details; questionnaire provided on Appendix D). A 5-point Likert-type scale was added to the MCOPE to measure the perceived coping effectiveness of each strategy used (same as section 5.2.). Cronbach Alpha's for coping and coping effectiveness scales are the same as section 5.2.

6.3.3. Procedure

Procedure is the same as section 5.3.3. (questionnaire pack provided in Appendix D). Participants' responses were classified into seven stress categories (see section 5.3.).

Data Analysis

First, data were screened for outliers and normality. Analysis of the normal probability plots from the regression standardized residuals suggested no deviations from normality. Scatter plots, Mahalanobis, and Cook's distance statistics indicated that none of the cases unduly influenced the results. Cronbach's alphas and descriptive statistics for all study variables were then calculated. Following this, correlations between the variables were calculated (see also appendix E for steps undertaken to assure that the data did not violate assumptions). To investigate whether mental toughness was associated with the type of stressor experienced, a regression analysis was conducted with either the six subscales of the MTQ48 or total mental toughness as predictor variables. Please note that because the six subscales of the MTQ48 are highly correlated with total mental toughness, it is not possible to include these in the same model and therefore separate analyses were ran. Similarly, to assess whether ratings of stress intensity and perceptions of control were influenced by mental toughness, a linear regression analysis as conducted controlling for stressor type. Stress intensity and control were the dependent variables. At Step 1 stressor type was entered and at Step 2 either the six subscales of the MTQ48 or total mental toughness was entered.

The association between coping, coping effectiveness, and mental toughness was also investigated using linear regression analysis. Each subscale of the MCOPE was the dependent variable and the six subscales of the MTQ48 or total mental toughness were the predictor variables. The main aim of the present study was to assess whether mental toughness predicted the selection of coping strategies and self-ratings of coping effectiveness, therefore the additional variance (ΔR^2) mental toughness added above and beyond the variance explained by gender, stress intensity, perceived control, or stressor type was analysed.

6.4. Results

Analysis of the normal probability plots from the regression standardized residuals suggested no deviations from normality. Scatter plots, Mahalanobis, and Cook's distance statistics indicated that none of the cases unduly influenced the results (see Appendix E). Table 20 provides the means and standard deviations for the coping strategies and coping effectiveness.

Table 20: Mean and standard deviation for each of the coping strategies, and coping effectiveness.

Coping strategies	Extent of use	Perceived effectiveness
Problem-focused coping strategies		
Active coping	3.20 (.52)	3.03 (.55)
Seeking informational social support	2.83 (.98)	2.76 (.67)
Planning	3.22 (.83)	2.92 (.59)
Suppress competing activities	3.07 (.85)	2.81 (.56)
Increasing effort	4.01 (.79)	3.28 (.57)
Emotion-focused coping strategies		
Seeking emotional social support	2.67 (1.00)	2.65 (.74)
Humour	2.35 (1.10)	2.31 (.83)
Venting emotions	2.31 (.99)	2.30 (.76)
Self-blame	2.84 (.96)	2.50 (.65)
Wishful thinking	2.85 (.93)	2.32 (.66)
Avoidance coping strategies		
Denial	2.14 (.78)	2.19 (.74)
Behavioural disengagement	1.72 (.80)	2.16 (.92)

The mean stress intensity was 6.24 (*SD* = 2.33) and 5.54 (*SD* = 2.72) for perceived control. Table 21 provides the correlations between the six subscales of mental toughness, total mental toughness score, coping, and coping effectiveness. The means and standard deviations for the six subscales of mental toughness, and total mental toughness score were as follows: Challenge *M* = 3.71, *SD* = .49; Commitment *M* = 3.53, *SD* = .55; Control Emotion *M* = 3.12, *SD* = .73; Control Life *M* = 3.51, *SD* = .55; Confidence Abilities *M* = 3.45, *SD* = .63; Confidence Interpersonal *M* =3.70, *SD* = .68; mental toughness Total Score *M* = 3.52, *SD* = .46.

As expected the different aspects of mental toughness had diverse relationships with coping and coping effectiveness. The correlational analysis (see Table 21) provided support for most a priori predictions. In particular, most of the low to

moderate correlations were in the predicted direction except for active coping and self-blame and control over emotions for coping effectiveness.

Table 21: Correlations between the six mental toughness sub scales, total mental toughness, coping, coping effectiveness, stressor intensity and stressor control.

Coping strategies		CH	C	CE	CL	CA	IC	MT
Problem focused coping strategies								
Active coping	CO	-.27**	-.67**	-.37**	-.43**	-.38**	-.14**	-.51**
	CE	.18**	.18**	.25**	.20**	.23**	.11*	.23**
Seeking instrumental social support	CO	.09*	.10*	.08	.03	.10*	.06	.10*
	CE	.11*	.14**	.08	.10*	.11*	.05	.13**
Planning	CO	.20**	.20**	.18**	.16**	.19**	.15**	.23**
	CE	.21**	.23**	.23**	.26**	.30**	.10*	.29**
Suppress competing activities	CO	.16**	.15**	.11*	.13**	.14**	.09	.17**
	CE	.16**	.15**	.14**	.19**	.18**	.06	.19**
Increasing effort	CO	.24**	.22**	.25**	.26**	.29**	.16**	.30**
	CE	.22**	.18**	.27**	.25**	.29**	.12**	.28**
Emotion focused coping strategies								
Seeking emotional social support	CO	.04	.05	-.03	-.01	.02	.01	.02
	CE	.07	.07	-.01	-.07	.04	.01	.06
Humour	CO	-.09	-.24**	-.02	-.17**	-.07	.02	-.14**
	CE	-.07	-.08	.02	-.06	.02	-.03	-.05
Venting emotions	CO	-.14**	-.22**	-.22**	-.28**	-.27**	-.06	-.26**
	CE	-.06	-.04	.01	-.08	.01	.01	-.03
Self-blame	CO	-.07	-.11*	-.10*	-.13**	-.18**	-.04	-.14*
	CE	-.01	-.05	.09*	-.01	.05	-.05	.01
Wishful thinking	CO	-.21**	-.22**	-.20**	-.29**	-.24**	-.10*	-.27**
	CE	-.09	-.10*	-.02	-.09*	-.01	-.01	-.07
Avoidance coping strategies								
Denial	CO	-.09**	-.15*	-.06	-.22**	-.07	-.01	-.13*
	CE	-.07	-.10*	-.03	-.11*	-.01	-.03	-.07
Behavioural disengagement	CO	-.27**	-.36**	-.29**	-.39**	-.32**	-.11*	-.38**
	CE	-.05	-.07	-.08	-.10*	-.09	-.09*	-.10*
Stressor intensity		-.14**	-.11*	-.25**	-.17**	-.19**	-.04	-.19**
Stressor control		.17**	.18**	.18**	.17**	.20**	.18**	.23**

Note: CH: Challenge; C: Commitment; CE: Control of emotions; CL: Control of life; CA: Confidence in abilities; IC: Interpersonal confidence; MT: Total mental toughness; CO: Coping; CE: Coping effectiveness. *$p < .05$; ** $p < .01$

The regression for stress intensity ($\Delta R^2 = .07$; $p < .001$) and perceived control ($\Delta R^2 = .05$; $p = .001$) with the six subscales of the MTQ48 as predictor variables were both significant. Interpersonal confidence (Beta = .11) was positively and control emotions (Beta = -.23) negatively associated with self-reported stress intensity. None of the variables significantly predicted perceptions of control. Total mental toughness predicted both stress intensity ($\Delta R^2 = .03$; $p < .001$, Beta = -.17) and perceptions of control ($\Delta R^2 = .04$; $p < .001$, Beta = .21). That is, increased levels of mental toughness were associated with lower levels of stress intensity but higher levels of perceived control. Regression analyses for stressor type were not significant ($p > .05$).

Table 22 provides the results of the stepwise linear regression analysis for establishing whether the six subscales or total mental toughness predicted the use of coping strategies and coping effectiveness, whilst controlling for gender, stress intensity, perceived control, and stressor type. Total mental toughness was a significant predictor for 11 strategies with positive associations among four of the problem-focused strategies, but a negative association with active coping. Negative associations were observed across four emotion-focused and both of the avoidance coping strategies. Problem-focused coping strategies were perceived to be effective by athletes with higher mental toughness. Two of the emotion-focused strategies and both the avoidance coping strategies were viewed as being less effective among athletes with higher mental toughness scores. The different subscales of the MTQ48 predicted the use of different coping strategies and how effectively the athletes rated these coping strategies.

Table 22: Results of the regression analysis with either coping or coping effectiveness as the dependent variables and the six subscales or total mental toughness as the predictor variables whilst controlling for gender, stress intensity, perceived control and stressor type.

	Extent of use				**Perceived effectiveness**			
		Six MT subscales	Total MT			Six MT subscales	Total MT	
Coping strategy	ΔR^2	Beta Significant predictors	ΔR^2	Beta	ΔR^2	Beta Significant predictors	ΔR^2	Beta
Problem focused coping strategies								
Active coping	.48**	CH = .24; C = -.72; CE= -.17	.24**	-.52	.07**	CE = .21	.05**	.24
Seeking informational social support	.02		.01*	.12	.02		.01*	.11
Planning	.07**	CL = -.32; CA = .17	.05**	.24	.09**	CA = .19	.07**	.28
Suppression competing activities	.03*		.02**	.16	.04**	CL = .17; IC = -.11	.02*	.16
Increasing effort	.10**		.09**	.31	.10**	CE = .17	.07**	.28
Emotion focused coping strategies								
Seeking emotional social support	.01		.00		.01		.00	
Humour	.09**	C = -.25; CL = -.17; IC = 12;	.03**	-.18	.02		.01*	-.10
Venting emotions	.10**	CE = -.15; CL = -.16	.06**	-.26	.02		.00	
Self-blame	.03*	CA = -.25	.02**	-.16	.03		.00	
Wishful thinking	.08**	CL = -.16	.07**	-.27	.02		.01*	-.12
Avoidance coping strategies								
Denial	.07**	CL = -.32; CA = .17	.03*	-.19	.03*	CL = -.15; CA = .16	.02*	-.12
Behavioural disengagement	.23**	C = -.14; CE = -.16; CL = -.28; IC = .14	.13**	-.39	.02		.02**	-.14

Note: CH: Challenge; C: Commitment; CE: Control of emotions; CL: Control of life; CA: Confidence in abilities; IC: Interpersonal confidence; MT: Total mental toughness.
*$p < .05$; ** $p < .01$.

6.5. Discussion

The results of the present study suggest that mental toughness was associated with stress intensity and control appraisal, but not the type of stressor experienced by athletes. Furthermore, total mental toughness, in addition to the six components of the MTQ48, was shown to be a predictor of coping and coping effectiveness in response to a self-selected sport stressor.

Personality traits, such as mental toughness, may influence the coping process directly via the choice of coping strategy or indirectly in terms of stressor type encountered and its appraisal (Bolger & Zuckerman, 1995). The present study did not find evidence to suggest that athletes with different levels of mental toughness reported different types of stressors. However, these results supported the a priori prediction that mental toughness would influence both self-reported stress intensity and perceptions of control over the stressful event. Higher levels of total mental toughness were shown to be associated with athletes experiencing less stress and more control independent of stressor type. When the athletes scored higher on emotional control they perceived less stress, whereas interpersonal confidence was actually associated with higher levels of stress intensity. This would suggest that being in control of one's emotions might be of benefit to athletes whilst competing. In addition, the fact that athletes high on interpersonal confidence experienced increased levels of stress intensity requires further research. This may suggest that athletes with high levels of interpersonal confidence may perceive high stress intensity as a facilitator to performance rather than something which is debilitative to performance (e.g., Jones & Swain, 1992; Mellalieu, Hanton, & Fletcher, 2006). However, the present study did not investigate whether athletes perceived stress intensity as either facilitative or debilitative and therefore no further conclusion can be drawn. The notion that total mental toughness predicted stress

intensity and perceptions of control would be in agreement with Clough et al.'s (2002) conceptualization.

The magnitude of most correlations obtained in the present study between mental toughness, coping, and coping effectiveness were in the low to moderate range. These findings would support Lazarus and Folkman's (1984) framework, that coping is a dynamic and recursive process that varies from situation to situation. Although moderator factors like personality could influence this process, it is assumed that these relationships would be relatively weak.

The direction of the correlations between mental toughness and coping supported most of the previous predictions. Total mental toughness and the components of mental toughness correlated positively with problem-focused coping strategies, but negatively with emotion-focused and avoidance coping strategies. At the macro level, these results resemble those of Nicholls et al. (2008). The latter used the Coping Strategies in Sport Competition Inventory (ISCCS; Gaudreau & Blondin, 2002) to assess coping. Due to the differences in how coping strategies are categorized in the MCOPE and ISCCS it is difficult to make direct comparisons. Both questionnaires, however, include an effort scale which showed similar correlations.

All six components and total mental toughness were negatively associated with active coping. Carver et al. (1989) defined active coping as "the process of taking active steps to try to remove or circumvent the stressor or to ameliorate its effects" (p. 268). Mentally tough athletes, however, are more likely to confront a stressor and see it as a challenge, remaining determined and focused (Jones et al., 2007) rather than attempt to avoid or reinterpret its effects. As such, the current negative correlations between mental toughness and active coping are not surprising. However, when the more mentally tough athletes used active coping they perceived this to be an effective coping strategy. It is important to highlight that the term 'more mentally tough athletes' used in

this study refers to those athletes scoring higher on the MTQ48 in this particular sample. No normative scores for Mental Toughness are currently available on the MTQ48, so no comparison can be made to an average population score.

The coping and total mental toughness regression analysis mirrored the results of the correlational analyses. Higher levels of mental toughness were associated with more problem-focused coping with the exception of active coping, but less emotion-focused or avoidance coping strategies. When the six components of mental toughness were used as predictor variables, some interesting differences emerged. Challenge predicted the use of active coping whereas commitment and emotional control predicted less use of this coping strategy. This could suggest that when more mentally tough athletes see stressors as a challenge they actively want to deal with them, but that they are committed to achieve their goals and confront the stressor. The ability to control emotions appears to be an important factor in this process. When athletes exhibited higher levels of commitment, they were less likely to use humour and behavioural disengagement coping strategies. Such findings would support the widely held belief that mentally tough athletes do not give up and are not likely to laugh things off. It was also found that athletes with higher confidence levels in their ability were less likely to use self-blame as a coping strategy. However, such athletes used planning and denial more, which were also perceived to be effective coping strategies. These results might be related to the protection of an athlete's perceptions of his or her abilities. Hence, self-blame may indicate a lack of skill and could potentially undermine confidence in one's ability whereas denial allows the athlete to ignore potential deficits in abilities. Such an interpretation would suggest that the coping strategies predicted by ability confidence might have a self-serving bias by avoiding internalization of possible deficits in abilities.

A number of studies have suggested that mentally tough athletes cope effectively (e.g., Jones et al., 2007; Thelwell et al., 2007). The current study is the first to provide partial support for this assertion. In particular, positive correlations were found between mental toughness and the problem-focused coping strategies and negative correlations with the emotion-focused and avoidance coping strategies. The regression analysis showed that higher levels of total mental toughness predicted increased self-ratings of coping effectiveness for the same four problem-focused coping strategies (seeking informational social support, planning, suppression of competing activities, and increasing effort). Also, higher levels of mental toughness were associated with lower ratings of effectiveness for the denial, humour, behavioural disengagement, and wishful thinking coping strategies. The subscales predicted four of the problem-focused coping strategies. For example, emotional control predicted higher levels of coping effectiveness in active coping and increasing effort whereas higher levels of life control was associated with lower rating of coping effectiveness for denial but higher ratings for suppression of competing activities. On the whole, the results suggest that mentally tough athletes only rate their efforts as more effective when employing problem-focused coping strategies. When mentally tough athletes use emotion-focused or avoidance coping strategies they are generally rated as less effective indicating that coping effectiveness is influenced by the coping strategy employed.

The present study is not without limitations. A cross-sectional design was used which can therefore not allow causality to be infered. Data were self-reported, retrospective, and from competitive athletes which limits the generalizability of the findings. It was assessed how athletes coped with one specific stressful event without controlling for possible baseline differences in stress reactivity. Furthermore, it was only reported the coping effectiveness of each strategy and not how mentally tough athletes coped overall. Future research could investigate coping over time and multiple

stressful events (e.g., daily process method). In addition, it might be useful to investigate whether mentally tough athletes perceive stressors as threats, challenges, harmful, or beneficial (primary appraisal) and levels of emotional control (secondary appraisal; Lazarus & Folkman, 1984).

Chapter 7: Epilogue

7.1. Overview

The aims of this research programme were twofold. Firstly, the programme investigated the relationship between gender and coping in sport and secondly the relationship between personality and coping in sport was examined. This thesis provides a unique contribution to the extant literature on coping in sport from both a theoretical and applied perspective. The work would be of interest to both sport psychology researchers and applied practitioners, as it compares coping among male and female athletes addressing previous methodological limitations in the area. In addition, it provides further knowledge on the relationship between personality and coping in sport.

The purpose of Study 1 was to compare the utility of the dispositional and situational hypothesis/role constraint theory in determining gendered-ways of coping. The results of this study revealed gender differences in stress appraisal. In particular, female soccer players had a tendency to appraise experimenter defined scenarios with higher levels of stress intensity and lower levels of control compared to the male soccer players. Gender main effects were found for most coping strategies with females reporting higher use of coping strategies compared to the males. However, when using appraisal of the stressor as a modering factor between gender and coping, interaction effects were not observed. The absence of interaction effects suggests that when male and female soccer players perceive similar levels of stress intensity and control over an acute stressor they exhibit similar coping preferences, signifying that situations are influencing coping preferences among males and females. These findings provided support for the situational hypothesis (Tamres et al., 2002) or role constraint theory (Rosario et al., 1988). On the other hand, it was suggested that the cognitive appraisal process may be influenced by biological and social factors which can explain

differences in appraisal between the genders as suggested by the dispositional hypothesis (see section 2.3.1 for more detail).

Although the first study extended the knowledge base and understanding of gender and coping in sport from both a theoretical and applied perspective the study was not without a number of limitations. In particular, retrospective assessment of coping is associated with decreased accuracy of recall, overreporting of cognitive coping and underreporting of behavioural coping, and distorted by knowledge about success of efforts to resolve the stressful event (Brown & Harris, 1978; Smith, Leffingwell, & Ptacek, 1999; Stone et al., 1998). Therefore, Study 2 used the think aloud protocol (Ericsson & Simon, 1993) to assess coping 'on line' during actual motor performance. Study 2 included three experiments. Results from Experiment 1 suggested that verbalizing thoughts when executing a novel complex motor task does not result in decrements in performance. Experiments 2 and 3 investigated the effects of various forms of stress on a complex motor skill (golf putting task) performance. Results from Experiments 2 and 3 suggest that male and female participants experienced similar levels of stress intensity (e.g., heart rate, task completion time, cognitive anxiety, somatic anxiety, and performance). However, they varied in the nature of the frequency of reported stressors. Females reported the putter (Experiment 2) and task execution (Experiments 2 and 3) more often as a stressor, whereas males reported outcome more frequently as a stressor (Experiments 2 and 3). Although there were differences in coping at the dimensional and strategy level between the genders these differences were mainly due to the male and female participants appraising the experimental situation in a different way. That is, different coping strategies were used for stressors which were reported with different frequency. The males and females reported similar coping strategies for stressors which were reported with a similar frequency. In this way, Study 2 concluded that when males and females experience the same stressful situation, they

exhibit a similar stress response, however, significant and consistent differences in terms of reported type of stressors seem to exist. This difference in appraisal could explain differences in coping preferences rather than gender per se.

In this way although Study 2 used a completely different methodology from Study 1 to investigate gender and coping in sport, results appear to be consistent suggesting that males and females are more likely to differ in cognitive appraisal rather than in coping preferences. These findings suggest that gender differences in coping in sport are more likely to be explained by the situational hypothesis (Tamres et al., 2002) or role constraint theory (Rosario et al., 1988) whereas the cognitive appraisal process is more likely to be explained by the dispositional hypothesis (see section 2.3.1 for more detail on the theories). However, as an investigation into the cognitive appraisal process of males and females in sport is required to confirm this assumption, as this was not the main aim of the thesis, further conclusions cannot be drawn.

Studies 3 and 4 investigated the relationship between personality and coping. Although findings from the mainstream psychological literature suggest that personality is a contextual factor influencing coping this relationship has been mostly ignored in the sport psychological literature.

The aim of Study 3 was to investigate the relationship between the Big Five personality dimensions, stressor type, appraisal, coping and coping effectiveness in sport. The main findings of this study were that the Big Five dimensions influence all aspects of the stress-coping process except type of stressor reported. In particular, neuroticism was associated with higher and agreeableness with lower levels of stress intensity. Also, neuroticism predicted lower and conscientiousness higher levels of control over the self-reported stressful event. All of the Big Five dimensions predicted coping and coping effectiveness. However, in particular higher levels of neuroticism were associated with the use of coping strategies which are generally believed to be

maladaptive. Athletes high in neuroticism used more emotion-focused and avoidance coping strategies. Emotion-focused and avoidance coping strategies are considered maladaptive because they do not deal directly with the problem, but postpone problem solving to a later date. Such strategies might provide temporary relief but can only be sustained for a limited period of time. For instance, if a person wants to disengage from a stressful event that cannot be given up, then increased levels of stress are expected (Carver & Scheier, 1999). On the whole the findings supported previous research from the mainstream psychological literature which suggests that personality traits may influence the coping process directly via the choice of coping strategy or indirectly in terms of stressor appraisal and coping effectiveness (Bolger & Zuckerman, 1995; DeLongis & Holtzman, 2005).

Study 4 was similar to Study 3 but investigated the relationship between the sport specific personality trait mental toughness and stressor type, stressor appraisal, coping, and coping effectiveness. Results showed that higher levels of mental toughness were associated with lower levels of stress intensity and higher levels of perceived control independently of the stressor type reported. Furthermore, higher levels of mental toughness were associated with more problem-focused coping, but less emotion-focused and avoidance coping. These findings provided support for the a priori predictions and previous research by Nicholls et al. (2008).

Overall these results suggest that both gender and personality are moderator factors which can influence the stress-coping process. Gender appears to be particularly influential in the appraisal process whereas personality has both influence on appraisal and coping. It is important to highlight that all the four studies in the current research programme provide support for the transactional perspective of coping (Lazarus & Folkman, 1984) (see section 2.1.; 2.2. for detail). As suggested by Study 1 coping strategies used were different across the scenarios. In Study 2 stressors and coping

strategies reported varied across the 20 putts in both experiments. These findings provide support for the notion that stress and coping is a dynamic process that changes depending on the specific demands of the situation. Furthermore, as suggested by Study 3 and Study 4, the Big Five and mental toughness, respectively, have shown low to moderate correlations with coping strategies used in sport, supporting Lazarus and Folkman's (1984) framework, that coping is a dynamic and recursive process that varies from situation to situation. Although moderator factors like personality could influence this process, it is assumed that these relationships would be relatively weak. The research programme was not without a number of limitations. Also, the findings of this thesis have both future research implications and practical implications which will be discussed below.

7.2. Limitations and Future Research

An important observation (see section 2.3.2.) is that future research on the relationship between gender and coping in sport needs to be more theoretically orientated. In particular, it appears important for future research to take into consideration the type of event males and females encounter as well as how they appraise this stressful event (studies 1 and 2). A limitation of the present research programme was that it only assessed stress intensity and subjective perceptions of control over the event. Control is a multidimensional construct and its assessment has been controversial (e.g., Skinner, 1996) (see section 2.1.). However, future studies could also assess participants' means of accomplishing control (self-efficacy beliefs or agent-means beliefs that one is capable of producing the required response). In addition, recent research has also suggested that perceived control over internal states (emotions, thoughts, physical reactions) might be important (Pallant, 2000). Three important questions are associated with emotional control perceptions. First, do males and females

differ in emotional control perceptions? Secondly, future research should investigate the buffering effects of perceptions of emotional control on the frequency and type of stressful events encountered by males and females as well as its direct effect on coping preferences. Thirdly, as suggested by the findings of the Study 1 it appears that age and years of experience may influence coping preferences depending on the stressor experienced. Future research investigating gender differences in coping should contemplate this fact, in addition, further studies are also required investigating the influence of age and years of experience on coping preferences in sport. Fourthly, future research should explore the relationship between personality traits like mental toughness and perceptions of emotional control and its effect on appraisal, coping preferences, and coping effectiveness. For example, a prediction would be that athletes higher in mental toughness and in particular in the emotional control subscale of the MTQ48 would also report higher perceptions of emotional control. The effects between the emotional control subscale of the MTQ48 and perceptions of emotional control could be associated with coping preferences and increased levels of coping effectiveness. However, this would need to be empirically tested. Of course, a researcher has to be aware of the demands placed on participants. As such it will probably be difficult to assess all aspects of appraisal. However, future research programmes have to establish which control perceptions are most influential and explain most of the variance in the selection of subsequent coping preferences and coping effectiveness.

A limitation associated with Study 1 was the fact that it only incorporated soccer players and three experimenter defined stressful events. Although it is important to have a homogenous group of athletes who are likely to experience similar stressors future research should incorporate different samples and stressors (experimenter defined or self-reported) to provide support for the generalisability of the findings of the research

programme in the present thesis. In addition, different assessment tools or measurement techniques could be used to investigate these issues. Most coping instruments are relatively long and take therefore a significant amount of time to complete by participants. Particularly when multiple assessments are made this might be problematic (this might particularly be an issue when using elite athletes as participants). Therefore, future research could use concept maps (Novak & Gowin, 1984), experience sampling (Hektner, Schmidt, & Csikszentmihalyi, 2007) or daily diary studies (e.g., Nicholls, Jones, Polman, & Borkoles, 2009) to obtain valid and reliable data in a more parsimonious manner thereby reducing the demand placed on the participants.

An additional limitation of Study 1 was that it only used harm/loss experimenter defined scenarios for which it was unclear whether they were perceived by the participants as a threat/harm or challenge/benefit. Lazarus (2000) has identified two types of loss relational meaning (threat and harm) and two types of gain relational meanings (challenge and benefit) between the individual and the environment. In this model gains and losses in the relational meaning have already taken place or are anticipated to happen in the future. Threat is an anticipated harm/loss, is damage that has already taken place, challenge an anticipated gain and benefit a gain which already has taken place. Future research could provide different experimenter described stressors which would be related to all four relational meanings put forward by Lazarus.

The taxonomy provided by Lazarus (2000) on relational meanings might also be of importance when investigating the role of personality on the appraisal process. In particular, one would expect that more mentally tough athletes as well as more extravert athletes will perceive stressful events as a challenge or benefit rather than a threat or harm. However, no research has provided support for this theoretical prediction. In addition, if personality influences the selection of relational meanings it would also be expected that this would influence the level of stress experienced as well as perceptions

of control and subsequently the selection of coping strategies. This would be an interesting avenue for future research.

All studies in the research programme were associated with a discrete number of stressors (e.g., three experimenter defined in Study 1 and one self-reported in Studies 3 and 4). From both a gender and personality perspective it would be important to establish whether these moderator factors influence the frequency of encountering stressful events as well as the type of event (differential exposure hypothesis; Suls & Martin, 2005). The daily process method (DeLongis & Holtzman, 2005) might be a useful method for doing this. A significant limitation, however, is that it will be difficult to assess stressful encounters during actual competitive sporting events. The think aloud procedure might be an alternative method. However, this is also limited to a number of sports. Hence, during normal golfing competitions it would be inappropriate for players to continually verbalize their thoughts. However, more sophisticated longitudinal studies are required using more advanced statistical techniques (e.g., multilevel modelling) to assess the influence of gender and personality on the type of stressors encountered, the frequency of such events, appraisal, coping, and coping effectiveness in the context of sport.

Gender and personality (neuroticism) might also influence either the emotional response to stressors (stress reactivity) or result in different baseline states of affectivity. In particular, when investigating the effects of neuroticism on the stress-coping process it might be important to establish baseline affective states. Such assessment could establish whether differences in stress intensity are the result of individuals high in, for example, neuroticism, interpreting the stressor as more severe or whether higher baseline states of negative affectivity are responsible for elevated stress intensity scores. At this stage it is also unclear whether males and females have different baseline affective states.

The present research programme did not consider the emotional response of athletes in relation to the stressful encounter and coping. Although it is legitimate to explore different aspects of the stress-coping process as operationalised by Lazarus and Folkman (1984) in isolation, future research should also establish whether gender or personality has consequences for the emotions experienced by athletes. Hence, the emotional response will have consequences for the interpretation of future stressful events. In addition as suggested by Thatcher, Lavallee, and Jones (2004) the relationship between emotion and coping is a crucial factor to investigate as it influences key psychological functions, and an athlete's potential success in competitive sport.

As suggested by the findings in Study 2, even in situations when males and females appraise the situation similarly in terms of stress (heart rate, task completion time, cognitive anxiety, somatic anxiety, and performance) and control they still differ in the nature of the stressor reported. Future research is required to investigate whether differences in cognitive appraisal are the result of biological or social factors (Taylor et al., 2000). In particular, qualitative research might be required to investigate male and female cognitive appraisal of stressful events in sport. As suggested by previous research (Thatcher & Day, 2008) the underlying properties of stressful appraisals proposed by Lazarus and Folkman (1984) are relevant in sport. However, it is questionable to what extent do males and females experience the same underlying properties of stress in sport. Future research extending the same line of inquiry used in Thatcher and Day's study is warranted investigating the underlying properties of stress among males and females in sport.

Study 3 suggested that in particular neuroticism might be associated with maladaptive appraisal and coping. The mainstream psychological literature has suggested that higher levels of neuroticism might be associated with a negative cascade

(Suls & Martin, 2005). However, it has been well reported that engagement in exercise or sport might have a number of positive psychological consequences for participants. For example, acute bouts of exercise participation are associated with improved mood, lower levels of state anxiety and lower levels of depression (e.g., Biddle & Mutrie, 2008). Future research, therefore, should investigate whether such a negative cascade exists for neurotic individuals in the domain of sport or exercise participation or whether engagement in such activities might moderate affective states.

Study 4 used the conceptualisation by Clough et al. (2002) to assess mental toughness. Although their MTQ48 has now been used in a number of published studies and a recent study by Horsburgh et al. (2009) suggested that the factorial structure of the instrument was acceptable, the psychometric properties of the instruments could probably be improved. For example, the reliability value was below .70 for the emotional control subscale in Study 4. On the other hand, Study 4 provided support for the predictive validity of the MTQ48. On the whole, future studies should investigate the psychometric properties of the MTQ48 or alternative instruments which claim to measure mental toughness. In this respect research has previously used the Psychological Performance Inventory (PPI; Loehr, 1986) to assess mental toughness (e.g., Golby & Sheard, 2004). However, Middleton, Marsh, Richards, and Perry (2004) have criticized the research that used the PPI (e.g., Allen, 1988; Dongsung & Kang-Heon, 1994; Gould, Tuffey, & Loehr, 1996; Hanrahan, Grove, & Lockwood, 1990), because of the inadequate psychometric properties attributed to this instrument. Middleton et al. (2004) have developed their own 67-item Mental Toughness Inventory (MTI) which assess 12 characteristics of mental toughness: (a) self efficacy, (b) potential, (c) mental self-concept, (d) task familiarity, (e) value, (f) personal bests, (g) goal commitment, (h) perseverance, (i) task focus, (j) positivity, (k) positive comparisons, and (l) stress minimization. This instrument has a clear factor structure

and sound reliability, but further work on this instrument is necessary to examine the important aspect of predictive validity. Finally, Gucciardi et al. (2009) recently developed an Australian football mental toughness inventory (afMTI). Based on their earlier work in Australian football they proposed that mental toughness has 11 characteristics (Gucciardi et al., 2008). Their exploratory factor analysis only revealed four factors: thrive through challenge, sport awareness, tough attitude, and desire success. Although their exploratory factor analysis only resulted in four factors the items within the afMTI were related to all 11 characteristics proposed previously. The development of this sport specific inventory is in its infancy and further studies are required to test its factor structure, psychometric properties and predictive validity.

Future studies could also investigate the relationship between personality and coping with stressful events whilst controlling for possible differences in stress reactivity. This is not an easy issue. Most work on differences in stress reactivity has been conducted in laboratory environments. More ecologically oriented studies might be confounded by the fact that individuals experience different stressors. However, if personality dimensions have a genetic component, then differences in stress reactivity might be an important explanation in observed differences in appraisal, coping and coping effectiveness between individuals.

Finally, once a greater understanding of the relationship between personality, appraisal, coping, and coping effectiveness has been developed theory guided interventions should be developed and tested. To date very few intervention programmes have been developed and scientifically tested within the domain of sport. However, this has the potential to impact significantly upon athletic performance and satisfaction.

7.3. Applied Implications

The findings from the first two studies suggest that practitioners should not differentiate between males and females when teaching coping skills. Instead, a first assessment of male and female cognitive appraisal process before developing coping skills would be recommended. Hence, it appears that the appraisal process is of importance when teaching athletes coping skills.

Studies 3 and 4 found support for the notion that personality affects coping preferences selection directly, and also has an effect on the appraisal process, and coping effectiveness. The findings from Study 3 suggest that in particular athletes high in neuroticism may be a concern for coaches and applied practitioners as they experience more stress, lower perceptions of control, use maladaptive coping strategies, and view their coping as less effective. Coaches and applied practitioners should be aware that this personality dimension appears to be less suitable for competitive sport, and might also be a precursor of drop-out from competitive sport. The other four personality dimensions, on the other hand, might be more suitable for achieving high performance levels in competitive sport. In addition, the results from Study 3 support the notion that certain personality dimensions such as extraversion, and agreeableness are more likely to be associated with sport participation than the other three dimensions.

Findings from Study 4 suggest that athletes high in mental toughness experienced lower levels of stress intensity, higher levels of control, used more problem-focused coping strategies and less emotion-focused or avoidance coping strategies. In addition, more mentally tough athletes only rated problem-focused strategies as being more effective. Although problem-focused coping seem to be rated as most effective, it is believed that coaches and applied practitioners should teach a broad coping repertoire to athletes in order to prepare them to deal with different stressors. In particular when facing a highly stressful encounter, it would be beneficial

to first lower stress levels using emotion-focused coping strategies before using strategies to solve the problem. In addition, the findings of Study 4 suggest that increasing an athlete's mental toughness might also be associated with the use of more adaptive coping strategies. However, research is required to investigate this assumption.

Based on the findings from Studies 3 and 4 coaches and applied practitioners could consider the evaluation of an athlete's personality before designing intervention programmes which might help athletes to cope more effectively. Personality traits are assumed to be relatively stable over time and therefore relatively difficult to change. It is therefore recommended that coaches or practitioners attempt to modify aspects of appraisal or teach coping skills, as these aspects can be changed more easily. As suggested by Semmer (2006) aspects of appraisal, reactivity and coping are changed more easily than personality dimensions, and success has been seen in stress management training and hostility interventions.

7.4. Conclusion

Studies 1 and 2 suggest that males and females do not differ in coping preferences when experiencing a similar stressor and similar levels of stress intensity and control. Study 1 examined gender differences in coping using a cross-sectional design and a sample of male and female soccer players. Results suggest that male and female soccer players differ in terms of stress appraisal and control over the stressor, however, no coping differences were observed across gender when controlling for appraisal differences between the genders. Study 2 investigated gender differences in coping using an experimental design, in a sample of male and female participants required to perform a complex motor skill (golf putting task) under a normal control and an experimental stress condition. Results showed that when experiencing a stressful condition, which is appraised similarly in terms of stress intensity and control, males

and females differ in terms of stressors perceived most pertinent in the encounter. Coping strategies used were shown to be similar by the male and female participants across the different stressors. Both experiment 2 and 3 provide support for the situational hypothesis (Tamres et al., 2002) or role constraint theory (Rosario et al., 1988).

Studies 3 and 4 provided an original contribution to the sport literature. Study 3 was the first study to investigate the relationship between the Big Five personality dimensions and coping in sport and Study 4 was the first study to investigate the relationship between mental toughness and coping effectiveness in sport. Both studies found evidence that personality directly influenced coping selection, and indirectly coping effectiveness and appraisal (stress intensity and control) but not type of stressor. In particular, Study 3 found that higher levels of neuroticism were associated with more maladaptative coping strategies which were generally not perceived to be effective. The other four personality dimensions were associated with more adaptive coping strategies which were perceived to be effective. Results from Study 4 suggest that mentally tough athletes only rate their efforts more effective when employing problem-focused coping strategies. When mentally tough athletes use emotion-focused or avoidance coping strategies, these are generally rated as less effective indicating that coping effectiveness is related with the coping strategy employed.

Based on the findings of this research programme the relationship between gender and coping in sport appears to be moderated by the appraisal process. In other words, males and females differ in appraisal rather than coping preferences in the sport domain. In addition, as suggested by the mainstream psychology literature, personality (Big Five and Mental Toughness) appears to be a moderator factor influencing coping preferences, coping effectiveness, and the intensity of the stressors experienced and perceived control, but not the type of stressor reported in sport.

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APPENDICES