The assessment of psychological resilience in sport performers

The Assessment of Psychological Resilience in Sport Performers

by

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Abstract

Why is it that some athletes are able to withstand the pressures of competitive sport and attain peak performances, whereas others succumb to the demands and under-perform? It is the study of psychological resilience that aims to address this question. To significantly advance psychologists' knowledge and understanding of this area, there exists an urgent need to develop a sport-specific measure of resilience (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi, Jackson, Coulter, & Mallett, 2011). The purpose of this thesis, therefore, is to investigate the assessment of psychological resilience in sport performers. To this end, the thesis is split into five chapters. Chapter one reviews and critiques the various definitions, concepts, and theories of resilience, and provides an overview of the research that has specifically examined psychological resilience in sport performers. Chapter two reviews psychometric issues in resilience research and its implications for sport psychology (part one), and discusses psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands (part two). Drawing on these reviews of resilience in sport, Chapter three (studies one-three) describes the development and validation of the Sport Resilience Scale (SRS). More specifically, Study 1 explores the content validity of a pool of items designed to reflect psychological resilience in athletes, Study 2 examines the factorial structure of the SRS using exploratory factor analysis, and Study 3 tests the factorial structure of the SRS via confirmatory factor analysis, investigates whether the components of the measurement model are invariant across different groups, and examines the relationship between the SRS and other relevant concepts. Using the SRS, and based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience, Chapter four (studies 4 and 5) investigates resilience in sport performers via an examination of moderation and mediation hypotheses. Specifically, Study 4 tests whether the association between the stressors athletes encounter and athletes' positive adaptation is moderated by the protective factors that athletes possess and Study 5 tests whether the association between the stressors athletes encounter and athletes' positive adaptation is mediated by their cognitive appraisal processes. Lastly, Chapter five offers a summary, discussion, and conclusion of the thesis. Overall, the research reported in this thesis has developed the first valid and reliable measure of psychological resilience in sport performers and has provided quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience by illustrating the moderating role of protective factors and the mediating role of cognitive appraisal.

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Chapter One: Introduction

> More than education, more than experience, more than training, a person's level of resilience will determine who succeeds and fails. That's true in the cancer ward, it's true in the Olympics, and it's true in the boardroom (Coutu, 2002, p. 47).

Andy Murray, professional tennis player, won Gold for Great Britain in the 2012 Olympic Games men's singles against Roger Federer, the man Murray lost to just a few weeks prior in the 2012 Wimbledon final. Murray beat Federer in straight sets (6-2, 6-1, 6-4). Subsequently, Murray went onto win his first Grand Slam at the 2012 US Open, beating world number one Novak Djokovic (7-6, 7-5, 2-6, 3-6, 6-2), and then his second by winning Wimbledon 2013, again beating Novak Djokovic (6-4, 7-5, 6-4), to become the first British man to win Wimbledon in 77 years. Before the 2012 Olympics, Murray had been in four Grand Slam finals and lost them all (three of which in straight sets), losing to Federer three times and Djokovic once.

> Murray's special selling point has been a refusal to become discouraged by humiliating defeats in earlier grand-slam finals. It was easy to imagine a malevolent voice taking up permanent residence in his psyche. It would have told him to give up on his fantasy of joining the gilded age of men's tennis, alongside Roger Federer, Rafael Nadal and Novak Djokovic. Instead Murray assimilated his setbacks calmly and rationally. He gained in strength and conviction (Hayward, 2012).

As illustrated in the above passage, Murray has consistently faced high pressure situations and has successfully dealt with a number of adversities. Why is it that some athletes, such as Andy Murray, are able to withstand the pressures of competitive sport and attain peak performances, whereas others succumb to the demands and under-perform? It is the study of psychological resilience that aims to address this question.

The introduction to the thesis is split into four main sections. The first explores my personal motives for researching the area of psychological resilience in sport. The second section considers how psychological resilience has been defined in the psychology research literature and examines the conceptualization of resilience. The third section reviews the theories of resilience and critically examines one theory in particular that is commonly cited in the resilience literature. The final section describes the growing body of evidence highlighting the importance of resilience in attaining high levels of athletic performance and provides an overview of the research that has specifically examined psychological resilience in sport performers.

1.1 Why Research the Area of Psychological Resilience in Sport?

Since about the age of eight, I have had a keen interest in competitive sport particularly cricket. At the age of fifteen, I was selected by my local club to trial for my respective age group county team (Middlesex County Cricket Club). This was the first time I had experienced high pressure situations in competitive sport and, on a personal level, where my interest in the area of psychological resilience stemmed from. During the trials, I encountered racism from the main selector but, despite this, I performed exceptionally well and was selected for the county team. However, in my first competitive game, I underperformed quite dramatically. During subsequent training sessions, I was given very detailed feedback to change minute aspects of my game and I consequently stopped enjoying the sport. On reflection, I wasn't able to withstand the pressures of county-level sport and it is perhaps why I subsequently became interested in the psychological make-up of athletes who perform at the highest level despite the various pressures they encounter.

This fascination became stronger when I applied to study Sport and Exercise Science at Loughborough University after reading about Barry Cowan, a professional tennis player ranked 265th in the world at the time, who took Pete Sampras to five sets and credited his commendable performance to a sport psychologist (Hayward, 2001). In my third year as an undergraduate student, I took a module on the "Psychology of Sporting Excellence" and was introduced to the topic of psychological resilience by my PhD supervisor, Dr David Fletcher, who was the module leader at the time. I had read several newspaper articles that talked about the importance of resilience in competitive sport but, on a cursory perusal of the literature, what became apparent was that, although there were numerous studies conducted with individuals who had been exposed to potentially traumatic events (e.g., terrorism, serious illness), there was a dearth of resilience studies in competitive athletes. Thus, it seemed like a good opportunity to research the area of psychological resilience in sport.

1.2 What is Psychological Resilience?

The study of psychological resilience seeks to understand why some individuals are able to withstand – or even thrive on – the pressure they experience in their lives. The word resilience originates from the Latin verb resilire, or "to leap back", and is defined in the Oxford Dictionary of English as being "able to withstand or recover quickly from difficult conditions" (Soanes & Stevenson, 2006, p. 1498). Over the past three decades, numerous definitions of resilience have been proposed in the psychology research literature (see, for a review, Fletcher & Sarkar, 2013). Despite the construct being operationalized in a variety of ways, most definitions are based around two core concepts: adversity and positive adaptation. Indeed, most researchers concur that, for resilience to be demonstrated, both adversity and positive adaptation must be evident (Luthar, 2006; Luthar & Cicchetti, 2000; Luthar, Cicchetti, & Becker, 2000; Masten, 2001; Rutter, 2006).

Considering the two component concepts in turn, adversity "typically encompasses negative life circumstances that are known to be statistically associated with adjustment difficulties" (Luthar & Cicchetti, 2000, p. 858). This threshold-dependent approach indicates that an incident can only represent an adversity if the problems displayed are greater than those exhibited in normative populations. However, this (negative) value-laden connotation associated with the term "adversity" is a fundamental issue in this area of resilience research. In their recent review of definitions, concepts, and theories of resilience, Fletcher and Sarkar (2013) argued that "ostensibly positive life events – that are *not* typically associated with a higher probability of undesirable outcomes – can be also be relevant in defining resilience" (p. 14). For example, getting married, which is unlikely to be labeled as an adversity, will nonetheless require a range of relationship-resources (e.g., observed problem-solving and support-seeking behaviors) to navigate marital-related stressors (Neff & Broady, 2011). Moreover, in their role as guest editors of the *Journal of Personality* on "Resilience in Common Life", Davis, Luecken, and Lemery-Chalfant (2009b) observed that for the vast majority of us, the adversities we experience do not comprise major calamities but instead are more moderate disturbances that are entrenched in our daily lives. Thus, when adversity is defined as an event that predicts maladjustment it precludes the inclusion of many ongoing daily stressors under the rubric of resilience, despite growing evidence to the contrary (Davis et al., 2009a; Neff & Broady, 2011).

Positive adaptation, the second component in the construct of resilience, is "[adaptation] that . . . is substantially better than what would be expected given exposure to the risk circumstance being studied" (Luthar & Zelazo, 2003, p. 515). In studies of resilience

across diverse risk circumstances, researchers have typically operationalized positive adaptation in terms of behaviorally manifested social competence, or success at meeting stage-salient developmental tasks (Luthar et al., 2000; Masten, 2001). In addition to being developmentally appropriate, Luthar and colleagues (Luthar, 2006; Luthar et al., 2000) have asserted that indicators used to define positive adaptation must be conceptually of high relevance to the adversity examined in terms of domains assessed and stringency of criteria used. Among children of depressed parents, for example, the absence of depressive diagnoses would be appropriate (see, e.g., Hammen, 2003), whereas among competitive athletes indicators of performance and well-being would be more contextually relevant. Regarding the stringency of criteria used, decisions to define resilience in terms of average or excellent levels of functioning must depend on the nature of the adversity (Luthar, 2006; Luthar & Zelazo, 2003). More specifically, if an individual is exposed to a serious life adversity (e.g., direct exposure to terrorist attacks) then near average functioning (e.g., absence of psychiatric symptoms) is appropriate to justify the existence of positive adaptation (see, e.g., Bonanno, Galea, Bucciarelli, & Vlahov, 2007). If the adversity is not as severe, but is nonetheless relatively taxing (e.g., operating in a demanding environment on a daily basis), then evidence of excellent functioning in the specific domain (e.g., peer recognition of performance) is required to demonstrate the existence of positive adaptation. To sum, the key messages to emerge from the work in this area is that most definitions of resilience are based around the two core concepts of adversity and positive adaptation, resilience is required in response to different adversities ranging from ongoing daily stressors to major life events, and positive adaptation must be conceptually appropriate to the adversity examined in terms of the domain assessed and the stringency of criteria used (Fletcher & Sarkar, 2013).

Alongside the debate about how resilience should be defined, there has also been considerable discussion about the conceptualization of resilience as either a trait or a process. When resilience has been conceived as a trait it has been suggested that it represents a constellation of characteristics that enable individuals to adapt to the circumstances they encounter (Connor & Davidson, 2003). These characteristics, which are commonly referred to as protective factors in the resilience literature, have been examined extensively by scholars seeking to identify the qualities of resilient individuals (see, for a review, Luthar, 2006; Masten & Reed, 2002; Rutter, 2000). Numerous protective factors have been identified in the resilience research literature including hope (Horton & Wallander, 2001), extraversion (Campbell-Sills, Cohan, & Stein, 2006), optimistic explanatory style (Kleiman, Liu, & Riskind, 2013), self-efficacy (Gu & Day, 2007), spirituality (Peres, Moreira-Almeida,

Nasello, & Koenig, 2007) and social support (Brown, 2008). The identification of these protective factors supports Rutter's (1987) view that psychological resilience is the "positive role of individual differences in people's response to stress and adversity" (p. 316).

While psychological resilience has been conceptualized as a trait, it has also been conceived as a process. For example, Luthar et al. (2000) referred to it as a "dynamic process encompassing positive adaptation within the context of significant adversity" (p. 543). The process conceptualization of resilience recognizes that is a capacity that develops over time in the context of person-environment interactions (Egeland, Carlson, & Stroufe, 1993). That is, the extent to which an individual reacts positively to adversity depends on the nature of the demands encountered and how he or she adapts to the circumstances. Moreover, the process conceptualization of resilience recognizes that resilience will vary contextually (from situation to situation) and temporally (throughout a situation and across an individual's lifespan). Thus, while an individual may react positively to adversity at one point in his or her life, it does not mean that the person will react in the same way to stressors at other points in his or her life (cf. Davydov, Stewart, Ritchie, & Chaudieu, 2010; Rutter, 2006; Vanderbilt-Adriance & Shaw, 2008). As Rutter (1981) observed: "if circumstances change, resilience alters" (p. 317).

Another relevant conceptual debate in this area is the comparison between psychological resilience and other potentially related constructs such as recovery and coping (see, for a review, Fletcher & Sarkar, 2013). Despite the Oxford Dictionary of English relating resilience with recovery, academic scholars differentiate between these constructs. Bonanno (2004) recognized that individuals' responses to PTEs vary and suggested that this variability is illustrated by four prototypical trajectories: chronic dysfunction, recovery, resilience, and delayed reactions. In the context of the present discussion, the distinction between recovery and resilience is particularly pertinent. Specifically, Bonanno (2004) suggested that recovery is characterized by a temporary period of psychopathology (e.g., symptoms of depression or posttraumatic stress disorder) followed by gradual restoration to healthy levels of functioning, whereas resilience refers to the ability of individuals to maintain normal levels of functioning. Support for this distinction has been forthcoming after loss (Bonnanno et al., 2002), major illness (Deshields, Tibbs, Fan, & Taylor, 2006), and potential trauma (Bonnano, Renicke & Dekel, 2005).

Second, while resilience and coping are often used interchangeably, there is a growing body of evidence to suggest that these are conceptually distinct constructs (Campbell-Sills et al., 2006; Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Major,

Richards, Cozzarelli, Cooper, & Zubek, 1998; Karoly & Ruehlman, 2006; Van Vliet, 2008). For example, Major et al. (1998) found that women who had more resilient resources to draw on (i.e., self-esteem, perceived control, and optimism) were less likely to appraise their upcoming abortions as stressful. However, for those women lacking in resilient qualities, their appraisals initiated and directed the coping strategies they used to deal with the event. Based on this finding and the collective body of work supporting the distinction between resilience and coping, Fletcher and Sarkar (2013) proposed that "resilience is characterized by its influence on one's appraisal prior to emotional and coping responses and by its positive, protective impact, whereas coping is characterized by its response to a stressful encounter and by its varying effectiveness in resolving outstanding issues" (p. 16).

In summary, resilient individuals display a variety of personal assets and are protected from the negative appraisal of stressors by the moderating effects of a wide range of personal and situational variables. Hence, resilience is conceptualized as the interactive influence of psychological characteristics within the context of the stress process (cf. Fletcher & Sarkar, 2012; 2013). Building on Rutter's (1987) perspective, Fletcher and Sarkar recently defined psychological resilience as "the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors" (2012, p. 675, 2013, p. 16). This definition extends previous conceptual work in this area in a number of ways. First, the focus on psychological resilience delimits the scope of the description, by definition, to "mental processes and behavior" and excludes other types of resilience such as physical, molecular and structural resilience. Second, this definition encapsulates aspects of both trait and process conceptualizations of resilience. Central to the definition is the focusing of the conceptual lens on the role that psychological-related phenomena play – rather than the mental processes and behavior per se – in avoiding negative consequences. Third, the emphasis is placed on the more neutral term "stressor" rather than the negative value-laden term "adversity" (cf. Fletcher & Sarkar, 2013). Fourth, the focus is on "promoting personal assets and protecting an individual from the potential negative effect of stressors" rather than positive adaptation per se because resilience generally refers to the ability of individuals to maintain normal levels of functioning rather than the restoration or enhancement of functioning (cf. Bonnano, 2004). The next section briefly reviews the various theories of resilience that have been proposed and critically discusses the most commonly cited theory in the literature.

1.3 Theories of Psychological Resilience

Examining psychological resilience through a theoretical lens is considered important

due to the need for resilience research to be theoretically driven (Luthar et al., 2000). During the past three decades, over a dozen theories of resilience have been proposed by various researchers (see, for a review, Fletcher & Sarkar, 2013). Two particular observations of these theories are worth noting. First, the theories to date have tended to focus on individuals that have been exposed to significant adversities such as a serious illness (Denz-Penhey & Murdoch, 2008) and the death of a close family member (Mancini & Bonnano, 2009). Second, most theories are based on particular populations such as adolescents (see, e.g., Haase, 2004) and families (see, e.g., Palmer, 2008). Whilst different theories have emerged, it is possible to identify a number of common features across the approaches taken. To illustrate, the majority of theories support both process and trait conceptualizations of resilience. More specifically, most theories incorporate the notion that resilience is a dynamic process that changes over time. Furthermore, most researchers acknowledge that, within the process itself, the interaction of a wide range of factors determines whether an individual demonstrates resilience. Interestingly, in terms of specific explanatory potential, the emphasis placed on different factors often varies across theories. For example, the adolescent resilience model (Haase, 2004) highlights family and social factors as being fundamental to resilience, whereas the hypothesized model of resilience to loss (Mancini & Bonnano, 2009) emphasizes the importance of personality factors (e.g., self-enhancing biases, optimism). In addition, while resilience is considered to be the most desirable outcome in the majority of theories, some researchers include other (positive) outcome indicators in their theories, such as productivity (Riolli & Savicki, 2003), job satisfaction (Paton et al., 2008), and optimal performance (Fletcher & Sarkar, 2012). Hence, as Fletcher and Sarkar (2013) noted, theoretical explanations of resilience often encapsulate other related psychosocial constructs and overlap with other areas of scientific inquiry.

With the majority of resilience theories being specific to particular populations (e.g., adolescents, families), there is an understandable call for a generic theory that can be applied across different groups of people and potentially stressful situations (see, e.g., Richardson, 2002). One such theory, which is commonly cited in the resilience literature (see, e.g., Agaibi & Wilson, 2005; Campbell-Sills et al., 2006; Connor & Davidson, 2003; Denz-Penhey & Murdoch, 2008; Galli & Vealey, 2008; Gu & Day, 2007; Sinclair & Watson, 2004; White, Driver, & Warren, 2008), is the metatheory of resilience and resiliency (Richardson, Neiger, Jensen, & Kumpfer, 1990; Richardson, 2002). This particular theory is discussed here since it can potentially be applied to different types of stressors and adversities and at various levels of analysis (such as individual, familial and community). Furthermore, to the best of our

knowledge, it is the only metatheory of resilience that includes a range of theoretical ideas from physics, psychology, and medicine (White et al., 2008).

According to Richardson (2002) and colleagues (1990), the process of resilience begins with a state of biopsychospiritual homeostasis, or a comfort zone, where people are in balance physically, mentally, and spiritually. Disruption from homeostasis occurs if and when individuals lack sufficient resources (i.e., protective factors) to buffer them against stressors or adversities. Once disruption from homeostasis occurs, individuals adjust and begin the reintegration process which leads to one of four outcomes: (a) resilient reintegration, (b) homeostatic reintegration, (c) reintegration with loss, and (d) dysfunctional reintegration. Resilient reintegration is the most desirable form of reintegration and occurs when disruption leads to personal growth and the acquisition of additional protective factors (e.g., an athlete that returns from a serious injury with a greater appreciation of sport and a stronger work ethic than before the injury). Homeostatic reintegration occurs when individuals "just get past" the disruption (Richardson, 2002, p. 312) but neither lose nor gain protective factors and thus remain at their previous level of homeostasis. Reintegration with loss occurs when individuals make it through adversity but lose important protective factors in the process because of the demands of the disruption (e.g., a basketball player that misses crucial free throws that would allow his team's season to continue who returns to play the following season but with a reduced sense of motivation and confidence). Finally, dysfunctional reintegration occurs when individuals engage in destructive behaviors to deal with negative circumstances (e.g., an athlete who is frustrated with his ability to improve his performance who turns to illegal performance enhancing drugs to gain an edge).

Whilst there has been some support for the model in relation to health promotion (Dunn, 1994; Neiger, 1991; Walker, 1996) and sport participation (Galli & Vealey, 2008; Machida, Irwin, & Feltz, 2013), the model is not without its drawbacks (see, for a review, Fletcher & Sarkar, 2013). First, it is a linear model which considers just one event as it relates to an individual's experience. With people likely to experience multiple stimuli simultaneously, the model does not take into account the effect this has on the disruption and reintegration processes (Richardson, 2002). Second, while Richardson acknowledges that disruption results in primary emotions (such as fear, anger and sadness), the model does not explain how meta-cognition and -emotion affect the reintegration process (cf. Efklides, 2008; Jager & Bartsch, 2006). The cognitive appraisal of emotions is an important aspect of the resilience process, with Fletcher and Sarkar (2012) suggesting that those who demonstrate resilience appraise emotions as facilitative to one's functioning (cf. Fletcher, Hanton, &

Mellalieu, 2006). Moreover, in their hypothesized model of resilience, Mancini and Bonnano (2009) proposed that appraisal processes are an important mechanism of resilience. Third, and perhaps most importantly, the model has a bias toward coping-orientated processes. This was highlighted by Connor and Davidson (2003) who discussed the model and subsequently concluded that "resilience may thus… be viewed as a measure of successful stress-coping ability" (p. 77). As noted previously, there is a growing body of evidence to suggest that resilience and coping should be considered conceptually distinct constructs (Campbell-Sills et al., 2006; Compas et al., 2001; Major et al., 1998; Karoly & Ruehlman, 2006; Van Vliet, 2008). Thus, this is a significant conceptual drawback of the model that diverts researchers' attention from examining the true nature of resilience.

In summary, this section has highlighted a number of important theoretical issues for scholars examining psychological resilience. First, whilst there are a variety of different explanations of resilience, they all exhibit some degree of commonality particularly with respect to encapsulating both process and trait aspects of resilience. Second, it is important that theories in this area take into account the multiple demands individuals encounter, the meta-cognitive and -emotive processes that affect the resilience-stress relationship, and the conceptual distinction between resilience and coping (cf. Fletcher & Sarkar, 2012). Third, scholars should attempt to incorporate aspects of complementary theories that further illuminate how individuals develop personal assets and psychologically protect themselves from potentially stressful encounters. To date, these issues have not been fully explored in the theoretical literature and, for progress to be made in our understanding of resilience, they should be considered in future scholarly activity. The final section describes the growing body of evidence highlighting the importance of resilience in attaining high levels of athletic performance and provides an overview of the research that has specifically examined psychological resilience in sport performers.

1.4 Psychological Resilience Research in Sport

Resilience has been widely researched in a variety of psychology domains including developmental and clinical psychology, yet in comparison there have been relatively few investigations of this desirable construct in the sport psychology literature. Due to the contextual specificity of resilience (cf. Luthar et al., 2000), the findings of many studies in this area in the general psychology literature are not easily applicable to elite athletes who actively seek to engage with challenging situations that present opportunities to raise their performance level, as opposed to clinical populations who have essentially been "forced" to exhibit resilience in order to maintain functioning (cf. Fletcher & Sarkar, 2012).

A growing body of evidence points to the importance of resilience in attaining high levels of sport performance (see, e.g., Gould, Dieffenbach, & Moffett, 2002; Holt & Dunn, 2004; Johnston, Harwood, & Minniti, 2013; Mills, Butt, Maynard, & Harwood, 2012; Weissensteiner, Abernethy, & Farrow, 2009). In their study examining the psychological characteristics of Olympic gold medalists, Gould et al. (2002) identified two overall categories linked to resilience: the overall handling of pressure and adversity (i.e., the capacity to deal with routine stressors of training and competition), and the psychological characteristics to overcome (i.e., the capacity to deal with potentially more extreme stressors such as long-term illness). In their study examining the psychosocial competencies associated with soccer success, Holt and Dunn (2004) identified resilience as one of the four factors that was central to success in elite youth soccer. Specifically, players described their ability to overcome potential obstacles and to respond positively to the demands of elite soccer. Weissensteiner et al. (2009) found that resilience was fundamental to the development of athletic expertise. Specifically, being resilient in the face of adversity and setbacks was considered to be important to become an expert in cricket batting. Building on the work of Holt and Dunn (2004), Mills et al. (2012) examined the factors perceived to influence the development of elite youth football players at a critical stage in their progression to the professional level. They identified resilience as one of the six factors perceived to positive influence player development with an optimistic attitude and confidence considered to be crucial constituents in building resilience. Most recently, Johnson et al. (2013) identified resilience as an important psychosocial asset for developing young competitive swimmers. Collectively, this body of work suggests that resilience is a prerequisite of athletic excellence across a variety of sports.

Interestingly, in their discussion of the psychosocial competencies associated with soccer success, Holt and Dunn (2004) observed that resilience has yet to be comprehensively investigated in an athletic context, despite the construct being related to high levels of sporting achievement. Indeed, it is only in the last decade or so that there has been an attempt to specifically investigate psychological resilience in sport performers (see Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi, Jackson, Coulter, & Mallett, 2011; Martin-Krumm, Sarazzin, Peterson, & Framose, 2003; Mummery, Schofield, & Perry, 2004; Schinke, Peterson, & Couture, 2004). In one of the initial sport-related resilience studies, Martin-Krumm et al. (2003) examined the relationship between explanatory style and resilience in a group of recreational basketball players using an experimental approach. Following failure feedback in a dribbling task, optimistic participants were found to be more confident, to be

less anxious and to perform better than pessimistic participants. Adopting a more ecologically valid approach, Mummery et al. (2004) explored the impact of three protective factors (viz. self-concept, social support, coping style) against three performance-related outcomes (i.e., initially successful performance; resilient performance involving an initial failure followed by subsequent success; non-resilient performance involving an initial failure followed by subsequent failure) in a National swimming championship. Findings revealed that resilient performers had higher self-perceptions of physical endurance but lower perceptions of social support than the other two groups. Moreover, the initially successful performers had higher perceptions of peaking under pressure and coping with adversity than the other groups. In an attempt to translate empirical evidence into practice, Schinke and colleagues (Schinke & Jerome, 2002; Schinke, Peterson, & Couture, 2004) described the implementation of a resilience training program for national team athletes and coaching staff. Specifically, based on the University of Pennsylvania resilience training protocol, the authors provided an overview of three general optimism skills (viz. evaluating personal assumptions, disputing negative thoughts, de-catastrophizing) that were taught to elite athletes to help them improve their performance in adverse competitive situations. Although the work in this area from 2002 to 2004 provided an initial insight into resilience in sport performers, it is worth noting that the research focused on a limited number of psychological characteristics (viz. optimistic explanatory style, self-concept, social support, coping style) that precluded participants from providing a broader insight into the trait and process elements of resilience.

Taking a more holistic approach to resilience enquiry, Galli and Vealey (2008) interviewed college and professional athletes about their perceptions and experiences of resilience using Richardson (2002) and colleagues' (1990) resiliency model as a guiding theoretical framework. Four different adversities were identified: injury, performance slump, illness, and career transition. Moreover, five general dimensions emerged that described the resilience experience of the athletes: breadth and duration of the resilience process, agitation (i.e., the use of a variety of coping strategies to deal with a wide range of unpleasant emotions and mental struggles), personal resources (e.g., positivity, determination, competitiveness, commitment, maturity, persistence, and passion for the sport), sociocultural influences (e.g., social support and cultural factors), and positive outcomes (e.g., learning, perspective, realization of support, and motivation to help others). As noted previously, Richardson's model is not without its limitations including the linear stage framework evident within its structure, the absence of meta-cognitive and -emotive processes, and its bias toward coping-orientated processes (cf. Fletcher & Sarkar, 2013). These drawbacks are of particular concern

since Richardson et al.'s (1990) model was used to help formulate questions for the interview guide and guide data analysis. In the context of the thesis, it is also worth noting that Galli and Vealey mentioned that "although no instruments designed to measure resilient qualities . . . have been developed for athletes, research using existing measures could stimulate the construction of sport-specific measures of resilience in sport" (p. 331).

Using quantitative analyses, Gucciardi et al. (2011) examined resilient qualities in a sample of Australian athletes. Although results provided partial support for the revised 10-item Connor-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007; Connor & Davidson, 2003) across samples of adolescent and adult cricketers, Gucciardi et al. argued that the "CD-RISC-10 (and its original version) diverts the user's attention from examining the true nature of resilience (i.e., positive adaptation in the face of adversity" (p. 430). In addition, they go on to mention that "important protective (e.g., teammate support) and vulnerability (e.g., rigorous training schedules) factors are likely not to be adequately captured when using measures such as the CD-RISC that were developed with other populations in mind" (p. 431) and assert, importantly, that "it is . . . important that researchers consider the merit of developing a sport-specific measure of resilience" (p. 431).

Most recently, Fletcher and Sarkar (2012) developed a grounded theory of psychological resilience in Olympic champions (see Figure 1.1). They interviewed twelve Olympic gold medalists to explore and explain the relationship between psychological resilience and optimal sport performance. The findings revealed that numerous psychological factors (relating to a positive personality, motivation, confidence, focus, and perceived social support) protected the world's best athletes from the potential negative effect of stressors by influencing their challenge appraisal and meta-cognitions. These constructive cognitive reactions promoted facilitative responses that led to the realization of optimal sport performance. Although the findings suggest that psychological resilience in competitive sport is likely to be a fruitful avenue for researchers to explore, Fletcher and Sarkar stated that:

> It will . . . be difficult to advance our understanding of this area without a valid and reliable assessment instrument. There exists an urgent need to develop a sport-specific measure of resilience, since current measures, such as the Connor-Davidson Resilience Scale (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003), only consider generic resilient qualities and not how these attributes come to the fore in specific contexts (cf. Gucciardi et al., 2011) (p. 676).

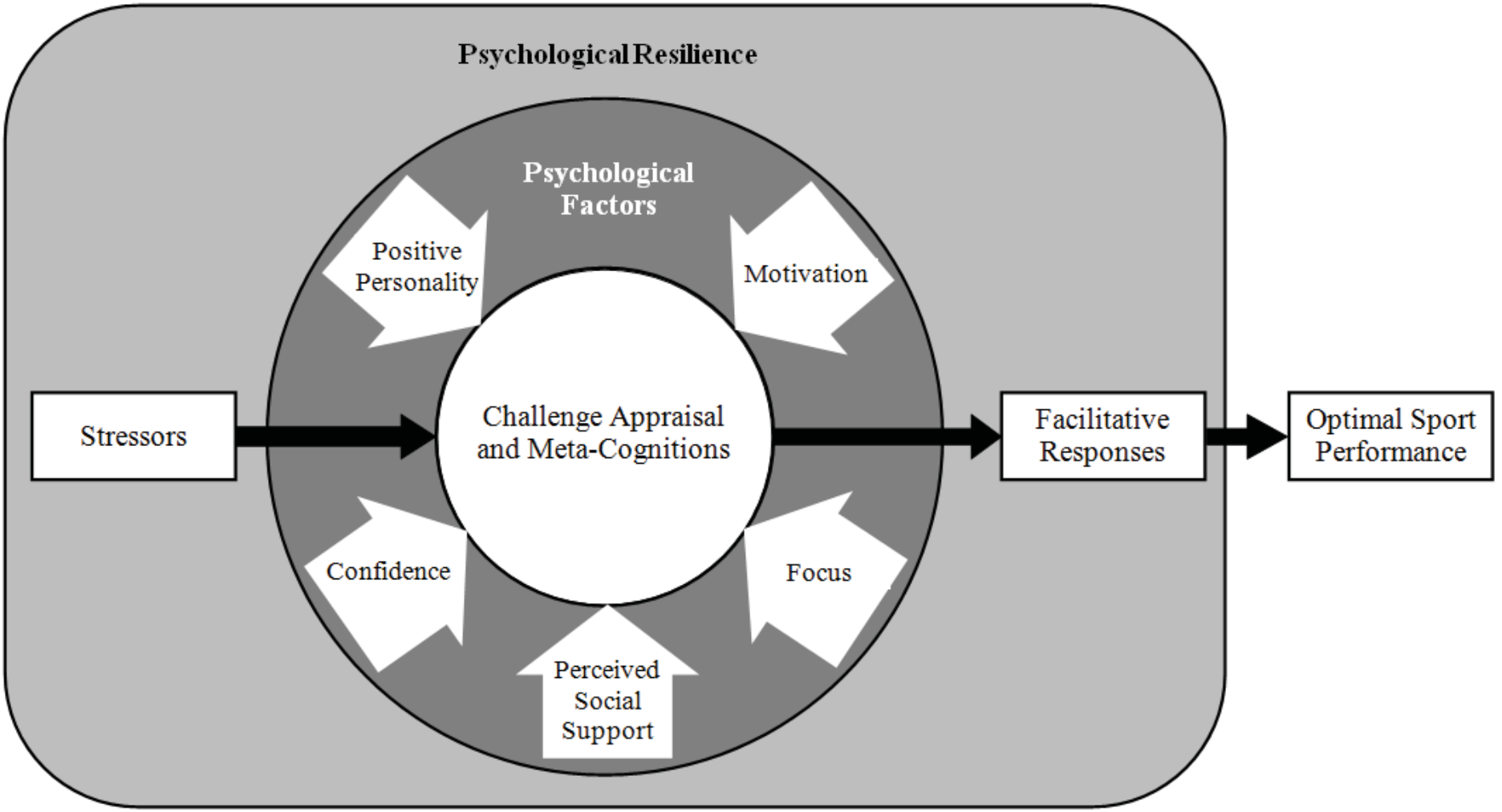

Figure 1.1. A grounded theory of psychological resilience and optimal sport performance (reproduced with permission from Fletcher & Sarkar, 2012).

1.5 Purpose of the Thesis

There is a general consensus in the sport psychology literature that a measure of psychological resilience in athletes is needed to advance researchers' understanding of this desirable construct (cf. Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). The purpose of this thesis, therefore, is to investigate the assessment of psychological resilience in sport performers. Specifically, the objectives are to provide a rigorous and robust foundation for the development of a sport-specific measure of resilience, to develop a valid and reliable measure of psychological resilience in sport performers, and with the measure, to quantitatively test Fletcher and Sarkar's (2012) theoretical model of sport resilience.

Fletcher and Sarkar's (2012) work provides a strong influence on the thesis because it is the only sport-specific theory of resilience, grounded in original data, which is free from the constraints of a preconceived model. The study informs the development of a sport resilience measure by providing an evidence-based platform for the item generation process. Furthermore, since the theory is relatively new and is currently untested across a range of athletes and sport settings, the thesis builds on the theory by using it to generate research questions and hypotheses about resilience in sport through large scale quantitative studies.

1.6 Structure of the Thesis

The thesis comprises of the following chapters: (1) Introduction; (2) Literature Review which explores psychometric issues in resilience research and the implications for sport psychology (part one) and discusses psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands (part two); (3) Studies One-Three which describes the development and validation of the Sport Resilience Scale (SRS), specifically to provide content validity for a pool of items designed to reflect psychological resilience in athletes (Study 1), to examine the factorial structure of the SRS using exploratory factor analysis (Study 2), and to test the factorial structure of the SRS via confirmatory factor analyses, to investigate whether the components of the measurement model were invariant across different groups, and to examine the relationship between the SRS and other relevant concepts (Study 3); (4) Studies Four-Five which tests Fletcher and Sarkar's (2012) theoretical model of sport resilience via an examination of SRS components through moderation (Study 4) and mediation (Study 5) analyses; and (5) Summary, Discussion, and Conclusion which provides a summary of the program of research, discusses the psychometric and conceptual/theoretical contributions of the thesis, its practical implications, strengths and limitations, and future research directions, and provides some concluding remarks.

Chapter Two:
Literature Review

In the previous chapter, I explored my personal motives for researching the area of psychological resilience in sport, described how psychological resilience has been defined and conceptualized in the psychology research literature, highlighted a number of important theoretical issues for scholars to consider when examining psychological resilience, and provided an overview of the research underlining the importance of resilience for sport performers and the studies that have specifically investigated psychological resilience in athletes. Chapter two consists of a literature review and is split into two parts. In part one, I review psychometric issues in resilience research and discuss the implications for sport psychologists seeking to measure this phenomenon in an athletic context. In part two, I discuss psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands.

Part One: How Should we Measure Psychological Resilience in Sport Performers? [1]

2.1 Introduction

> Resilience and vulnerability are often discussed in terms of major life adversity, such that a positive outcome (or lack of pathological outcomes) after experiencing such an event is viewed as evidence of resilience. However . . . motivated performance situations are also potentially stressful because they entail important consequences, yet are marked by uncertain chances of success (Seery, 2011a, p. 1606).

As illustrated in this quote, the construct of resilience is pertinent to challenging situations that require humans to carry out personally meaningful activities. A performance

[1] **Sarkar, M.**, & Fletcher, D. (2012, July). *How should we measure psychological resilience in sport performers?* Poster presented at the International Convention on Science, Education, and Medicine in Sport, Glasgow, UK.

Sarkar, M., & Fletcher, D. (2013). How should we measure psychological resilience in sport performers? *Measurement in Physical Education and Exercise Science, 17,* 264-280.

context where individuals need to manage stress and adversity to accomplish their goals is the domain of competitive sport. Elite athletes commonly encounter numerous stressors throughout their sporting careers (see, e.g., McKay, Niven, Lavallee, & White, 2008; Noblet & Gifford, 2002). These demands are typically associated with competitive performance (e.g., preparation), the sport organization within which the athletes operate (e.g., finances), and personal "nonsporting" life events (e.g., bereavement). In view of these findings, the study of psychological resilience is important in sport because athletes must constantly withstand a wide range of pressures to attain and sustain high performance.

Over the past three decades, numerous definitions of resilience have been proposed in the psychology research literature (see, for a review, Fletcher & Sarkar, 2013). Despite the construct being conceived in a variety of ways, most definitions incorporate two main conditions, namely exposure to adversity or risk and the attainment of positive adaptation or competence. To illustrate, Luthar, Cicchetti, and Becker (2000) referred to resilience as a "dynamic process encompassing positive adaptation within the context of significant adversity" (p. 543). In accordance with this conceptualization, Luthar and Zelazo (2003) asserted that resilience itself is never directly measured (see also Luthar, 2006; Masten & Obradovic, 2006). Rather, they argued that resilience is inferred based on the direct assessment of the two distinct dimensions: adversity and positive adaptation. From a measurement perspective, resilience researchers have also been concerned with assessing factors that protect individuals from the stressors they encounter (see, e.g., Connor & Davidson, 2003; Wagnild & Young, 1993). Examples of such qualities include: optimism, perseverance, an internal locus of control, self-efficacy, adaptability, and perceived social support. The assessment of such protective factors is consistent with Rutter's (1987) view that psychological resilience is the "positive role of individual differences in people's response to stress and adversity" (p. 316). Collectively, these definitional perspectives indicate that resilience measures need to consider three pivotal components – adversity, positive adaptation, and protective factors – in a tripartite fashion. Importantly, due to the fundamentally distinct nature of these concepts, researchers need to separately assess and analyze adversity, positive adaptation, and protective factors from the outset to realize a complete and accurate representation of resilience.

Since the assessment of resilience is inherently intertwined with definitional issues (Naglieri & LeBuffe, 2005; Windle, 2011), researchers have strived to address these concerns before measuring this desirable construct. Over the past decade, for example, academic scholars have sought to investigate some of the underlying issues of assessing resilience in

relation to those who have experienced childhood maltreatment (Haskett, Nears, Ward, & McPherson, 2006; Heller, Larrieu, D'Imperio, & Boris, 1999; Kinard, 1998; Walsh, Dawson, & Mattingly, 2010). Importantly, the findings of this work are not easily applicable to competitive sport performers who actively utilize and optimize a constellation of characteristics to ultimately raise their performance level, as opposed to clinical populations who have essentially been "forced" to exhibit resilient qualities in order to maintain normal functioning (cf. Fletcher & Sarkar, 2012).

In light of these contextual differences, researchers have recently begun to investigate psychological resilience in the specific domain of sport performance (see, e.g., Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). In all of the studies, it is interesting to note that the authors highlighted the need for a measure of psychological resilience for athletic performers to advance sport psychologists' understanding of this area. As a caveat to this recommendation, Gucciardi et al. (2011) argued that "before scholars can develop a sport-specific measure of resilience, there is a need for sport psychology researchers to provide a comprehensive review of methodological issues pertaining to the measurement of resilience and how it can be applied to sport" (p. 431).

The purpose of part one of this chapter is to review psychometric issues in resilience research and to discuss the implications for sport psychologists seeking to measure this phenomenon in an athletic context. Drawing on the broader measurement literature in this area to inform the discussion, the narrative is divided into three main sections relating to resilience and its assessment: adversity, positive adaptation, and protective factors. It is anticipated that the psychometric lessons learned in general psychology, combined with our knowledge of resilience-related topics in sport, will help researchers begin to answer the question: How should we measure psychological resilience in sport performers?

2.11 Measuring adversity. Luthar and Cicchetti (2000) stated that adversity "typically encompasses negative life circumstances that are known to be statistically associated with adjustment difficulties" (p. 858). Based on this approach, adversity is defined in terms of statistical probabilities; that is, a life condition qualifies as a risk indicator if it is significantly associated with maladjustment in critical domains (Masten, 2001). Exposure to parental divorce, for example, constitutes an adversity since children experiencing it are two to three times more likely than those from non-divorced families to exhibit psychological and behavioral problems (Hetherington & Elmore, 2003). From a measurement perspective, this indicates that an incident can only represent an adversity or risk if the problems displayed are greater than those exhibited in normative populations. However, in their recent review of

definitions, concepts and theories of resilience, Fletcher and Sarkar (2013) argued that when adversity is defined as a situation associated with negative consequences it prevents the inclusion of ongoing daily stressors despite an increasing amount of evidence to the contrary. This observation is particularly pertinent in the sport context since athletes typically experience regular everyday hassles that are embedded in their sporting careers, such as relationship problems, inadequate preparation, and logistical issues (see, e.g., Thelwell, Weston, & Greenlees, 2007). Indeed, in addition to encountering major "nonsporting" life adversities (see, e.g., Tamminen, Holt, & Neeley, 2013), athletes also encounter more common demands associated with competitive performance and the sport organization within which they operate. For example, Mellalieu, Neil, Hanton, and Fletcher (2009) identified five general categories of performance-related stressors in elite and non-elite sport performers. These consisted of preparation, injury, expectations, self-presentation, and rivalry. Most recently, Arnold and Fletcher (2012) synthesized the research that has identified the organizational stressors encountered by athletes. The demands were abstracted into 31 subcategories, which formed four categories: leadership and personal issues, cultural and team issues, logistical and environmental issues, and performance and personal issues. Accordingly, when assessing adversity in athletic performers, it is imperative that sport psychology researchers consider the inclusion of both significant life events and ongoing daily stressors.

In empirical studies of resilience, three broad approaches have been employed to measure adversity: multiple-item checklists of negative life events, single life occurrences, and the simultaneous consideration of multiple risks to form an overall adversity estimate (see, for a review, Luthar & Cushing, 1999). The first measurement strategy is commonly reflected in the use of checklists, such as the Life Events Checklist (Work, Cowen, Parker, & Wyman, 1990), that assess adverse events in an individual's life. To gain a more complete picture of adversity, scholars have also measured daily hassles to assess stressors that have lower severity but greater chronicity than major life events. The Daily Hassles Scale (Kanner, Coyne, Schaefer, & Lazarus, 1981) is a good example of this approach. From a measurement perspective, a main concern with such strategies involves the validation of the instruments as measures of adversity. When investigating the stress-buffering effects of resilience, for example, Pinquart (2009) attempted to address this concern by providing construct validity for a daily hassles measure since adolescents with more daily hassles were found to show higher levels of psychological distress. Although employing an outcome-dependent approach is clearly relevant when assessing adversity, Fletcher and Sarkar (2013) recently argued that

ostensibly positive life events – that are *not* typically associated with a higher probability of undesirable outcomes – can also make substantial contributions to adversity counts. To illustrate in an athletic context, winning an important sport competition is unlikely to be labeled as an adversity but will nonetheless require athletes to positively adapt to the inevitable heightened expectations related to success (cf. Kreiner-Phillips & Orlick, 1993). Notwithstanding this point, to ensure that a measure of adversity does in fact represent its intended concept, researchers seeking to measure psychological resilience in sport performers should provide empirical evidence of the associations between scores on an adversity measure and other conceptually related indices (cf. Masten, Best, & Garmezy, 1990).

An additional issue about life event measures pertains to potential measurement confounds; that is, variables that may influence the result of an investigation. In the context of assessing resilience, this concern specifically relates to the "controllability" of items. Numerous instruments using multiple-item checklists contain both "uncontrollable" events (e.g., serious illness) and "controllable" incidents (e.g., excessive smoking). While the inclusion of both types of circumstances appears intuitively reasonable, Luthar and Cushing (1999) suggested that the inclusion of controllable demands may artificially inflate associations between stressors and outcomes (see also Masten et al., 1988). In order to mitigate such associations, items that could be construed as clearly controllable by an individual, or as indexes of maladjustment, should ideally be excluded from potential measures (cf. Lin, Sandler, Ayers, Wolchik, & Leucken, 2004). With this in mind, sport psychology researchers developing a measure of psychological resilience in sport performers should therefore systematically identify the stressors encountered by athletes and, using a panel of experts, rate these stressors in terms of their controllability. If the majority of raters agree that the occurrence of a particular event is likely to be beyond the control of a typical athlete, it should be retained as part of a measure of uncontrollable sport-related stressors. Although events that are under a person's control could also be potentially stressful, from a methodological perspective, an instrument including only uncontrollable incidents (i.e., free of confounds) is deemed to be the most rigorous type of assessment strategy in resilience research.

A further consideration when using multiple-item inventories to measure adversity relates to the heterogeneity of events sampled. There is a need to differentiate between chronic circumstances and acute events since the effects associated with each of these categories can differ (Masten, Neemann, & Adenas, 1994). Indeed, in the context of athletic performance, Fletcher et al. (2006) noted that sport psychology researchers should take into

account the different properties of stressors, such as the duration (chronic vs. acute), frequency (rare vs. common occurrence), and intensity (high vs. low demand). Particularly relevant in the context of assessing adversity is whether it is appropriate to treat events that vary in intensity or seriousness, such as the death of a loved one or financial difficulties in the family, as comparable to one another (Luthar & Cushing, 1999). Failure to account for varying degrees of seriousness may at first glance appear to be problematic from a measurement perspective. However, studies that have examined weighted negative events, based on a respondent's estimation of relative impact, have shown little difference in weighted and unweighted scores (see, e.g., Swearingen & Cohen, 1985). Furthermore, relying on individuals to judge severity for themselves could potentially lead to spurious conclusions. Specifically, this approach can confound severity with individuals' responses to adversity, which is an outcome of interest (Kessler, 1997). To illustrate in a sport context, if an athlete classifies a performance slump, for example, as highly intense it could signify the severity of the event itself or it could be an indicator of maladjustment. Although solely assessing the number of events experienced may not fully capture the meaningful variability in adversity, frequency counts will avoid these potential ambiguities in measuring adversity (Seery, Holman, & Silver, 2010). Thus, when developing a measure of psychological resilience in sport performers, researchers in this area should request that athletes only indicate how *often* they encountered an adversity or stressor, rather than how intense or severe it was.

The second approach to assessing adversity has been based on specific life stressors. Examples of single life occurrences include war, serious illness, child abuse, and parental divorce. In an athletic context, examples include performance slumps (see, e.g., Grove & Stoll, 1998), career transitions (see Wylleman, Alfermann, & Lavallee, 2004), choking under pressure (see Hill, Hanton, Matthews, & Fleming, 2010), serious injuries (see e.g, Shearer, Mellalieu, & Shearer, 2011), disordered eating (see e.g., Papathomas & Lavallee, 2012), and emotional abuse (see e.g., Stirling & Kerr, 2008). As noted by Richters and Weintraub (1990), the main psychometric issue when considering such distal risk factors (i.e., factors that have a remote causal influence on a specific outcome), is that individuals demonstrating positive adaptation may actually be facing low proximal risks (i.e., risks that represent an immediate vulnerability). From a measurement perspective, it is important to note that single risk indices, such as a career-ending injury, are typically of a distal nature; they do not impinge on an individual directly but are influenced indirectly by various proximal variables, such as the availability of support. A specific event that has received considerable attention in an athletic context is the return to sport following a serious injury (see, for a review, Podlog

& Eklund, 2007). Using this incident as an illustration, sport psychology researchers (e.g., Rees, Mitchell, Evans, & Hardy, 2010) have identified a strong association between injury-related stressors (e.g., incapacitation) and negative psychological responses (e.g., devastation). Accordingly, athletic performers appear to be at high risk of maladjustment if they encounter a serious injury. However, in reality, they may be facing low proximal risk particularly if they perceive that social support is available to them since the detrimental relationship between stressors and psychological responses is reduced for those with high levels of perceived social support (Rees et al., 2010). With this example in mind, sport psychology researchers seeking to measure psychological resilience in sport performers should recognize that although examining distal risks can yield critical insights on successful adaptation in the face of adversity, they convey little information about the proximal processes by which they operate.

The third strategy of measuring adversity involves the constellation of specific, discrete risk factors that are combined to form an overall approximation of the adversity encountered. This cumulative risk approach, exemplified in the work of Sameroff and colleagues (e.g., Gutman, Sameroff, & Cole, 2003; Sameroff, Gutman, & Peck, 2003), typically involves computing a total risk score across different high-risk sociodemographic dimensions, such as low parental income and minority group membership, and subsequently assigning counts of one versus zero for each risk index. Researchers are increasingly using this measurement approach given that people experience multiple challenges simultaneously rather than in isolation (Fletcher & Sarkar, 2013; Heller et al., 1999; Luthar, 2006). Indeed, this assessment strategy has high face and ecological validity since it reflects the coexistence of multiple stressors in the real world. Notwithstanding the benefits of summated risk inventories, it is important that scholars examine the "riskiness" (Luthar & Cushing, 1999, p. 138) of individual variables before developing composite measures of adversity in resilience research. Large family size, for example, has been frequently used as a component within aggregated risk constellations. Although a high ratio of children to adults tends to be associated with relatively poor child outcomes (Garrett, Ng'andu, & Ferron, 1994), scholars have conversely found the co-residence of another adult to be negatively associated with the quality of parenting (Chase-Lansdale, Brooks-Gunn, & Zamsky, 1994). Hence, when assessing constellations of multiple risks in the domain of competitive sport, it is important that researchers are attentive to each of the individual items included within a composite measure of adversity to determine if they do, in fact, represent high risk for athletes.

2.12 Measuring positive adaptation. In conjunction with the assessment of

adversity, researchers striving to develop a measure of psychological resilience in sport performers need to separately assess positive adaptation. Positive adaptation or competence has been defined as "[adaptation] that . . . is substantially better than what would be expected given exposure to the risk circumstance being studied" (Luthar & Zelazo, 2003, p. 515). In studies of resilience in children and adolescents, researchers have typically operationalized positive adaptation in terms of achieving the social, behavioral, and educational milestones appropriate to their stage of development (Luthar et al., 2000; Masten, 2001). Accordingly, assessments of competence are usually derived from classmate, parent, and teacher ratings to gauge if children and adolescents are developing healthy and meaningful relationships with peers, are well-behaved, and are attaining good academic marks respectively. In contrast, adult resilience studies have generally focused on self-reported well-being and distress, with competence indices including longevity (see, e.g., Danner, Snowdon, & Friersen, 2001), physical and mental health status (see, e.g., Campbell-Sills et al., 2006), and career success (see, e.g., Bartley, Head, & Stansfield, 2007). Interestingly, it has been argued that the sole use of internal well-being indices is somewhat inadequate since it is unrealistic to expect individuals to instantly alleviate the emotional ramifications of critical threats to personal values, such as experiencing a serious injury (cf. Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003). To provide a more balanced representation of positive adaptation, Luthar, Sawyer and Brown (2006) suggested that scholars working with children and adults should learn from each other's methods as they consider strategies for assessing competence.

In a similar fashion to the measurement of adversity, three broad approaches have been employed to measure positive adaptation: multiple-item measures on a continuum between adjustment and maladjustment, the absence of serious psychopathology, and the integration of multiple domains of competence (see, for a review, Luthar & Cushing, 1999). As alluded to earlier, the first measurement strategy typically involves (external) ratings of young people's success at meeting stage-salient developmental tasks or (internal) ratings of adult's symptoms related to well-being. When researchers use multiple-item instruments to assess competence, a major problem is the difficulty of gauging "high competence" within the sample being examined since the reference group is usually the sample itself and not any larger normative group. As a result, when using such measures, little is known about how the most competent (resilient) individuals within the sample compare with those in low-risk groups. When employing this particular assessment strategy, scholars should interpret their findings with caution since it is possible – if one were to make comparisons with the general population for example – that the highest levels of competence within the sample were

merely the best of a generally poorly functioning group (cf. Mulholland, Watt, Philpott, & Sarlin, 1991). In order to address potential interpretive ambiguities in athlete-related resilience studies that lack a quantitative benchmark, sport psychology researchers should provide qualitative characterizations to help describe high and low levels of competence achieved by a subset of athletes within the group in question.

An additional concern about multiple-item scales of competence pertains to the validity of such measures regarding their conceptual relevance to the adversity being examined. Specifically, it has been argued that indices used to assess positive adaptation should be specific to the particular risk under scrutiny in terms of domains assessed and stringency of criteria used (see, for a review, Fletcher & Sarkar, 2013). To illustrate, when communities carry high risk for antisocial problems, it would be appropriate to assess socially conforming behaviors (see, e.g., Seidman & Pedersen, 2003), whereas among competitive athletes who typically seek out challenging situations to attain success and well-being, other indicators would be more contextually relevant. These include sport-related indices such as subjective performance (cf. Nicholls, Polman, & Levy, 2010), athlete satisfaction (cf. Jowett & Cramer, 2009), and flow (cf. Swann, Keegan, Piggott, & Crust, 2012), and general well-being indices such as life satisfaction and psychological well-being (cf. Lundquist, 2011). Importantly, although measuring risk can involve one or more negative events, competence should ideally be assessed across multiple "theoretically similar" (Luthar et al., 2000, p. 548) domains since an overly narrow conceptualization of positive adaptation can convey a misleading picture of success in the face of adversity (Luthar, 2006; Luthar & Zelazo, 2003). As a caveat to this assertion, when resilience is based on two or three confined domains of competence, it is important that scholars explicitly state that success in the particular areas cannot be assumed to generalize to other spheres. With regards to the stringency of criteria, assessment decisions should be determined by the seriousness of the risk under consideration (Luthar, 2006; Luthar et al., 2000; Luthar & Zelazo, 2003). Specifically, if an individual is exposed to a serious life adversity (e.g., direct exposure to terrorist attacks) it is sufficient to justify the existence of positive adaptation in terms of the absence of psychiatric symptoms. If the adversity is not as severe, but is nonetheless relatively taxing (e.g., operating in a demanding sport environment on a daily basis), then it is entirely appropriate to expect excellent functioning in the specific domain (e.g., peer recognition of athletic performance) as evidence of positive adaptation.

The second approach to assessing competence has been based on the absence versus presence of psychiatric symptoms. Measures based on this premise are most commonly

employed with individuals at high risk for serious psychopathology, such as military personnel (see e.g., Schaubroeck, Riolli, Peng, & Spain, 2011). Although sport performers are unlikely to encounter many incidents associated with a high probability of mental distress, there are a number of instances where athletes may be at-risk of maladaptive behaviors (Shearer et al., 2011). For example, it would be pertinent for sport psychology researchers to utilize this measurement strategy when investigating resilience in young athletes who have a family history of major psychiatric disorders (cf. Conrad & Hammen, 1993). In such situations, assessments would typically be derived from interviews with various informants. From a measurement perspective, the main concern when using this approach relates to potential reliability threats regarding information across respondents and among the interviewers conducting the assessments. Scholars need to consider the different sources of information when using this measurement strategy particularly when the target individual is a child (Windle, 1999). In relation to childhood maltreatment, for example, discrepancies between child, parent, and teacher reports are well-documented (see Haskett et al., 2006; Heller et al., 1999; Kinard, 1998; Walsh et al., 2010). Thus, a child may be considered competent based on the information from a parent but he or she may not be considered competent on the basis of a teacher. Moreover, questions have arisen about whether a teacher's evaluation accurately reflects a child's overall psychopathology when their knowledge is derived primarily from limited contact in a classroom environment (Kinard, 1998). In the context of competitive sport, it may be slightly less problematic for a coach to provide an accurate reflection of an athlete's mental state given that a coach is often the first person that an athlete looks to for advice, guidance and support when they are experiencing difficulty (Bowes & Jones, 2006). Notwithstanding this observation, it is critical that sport personnel conducting assessment interviews are provided with appropriate clinical training to ensure that there is sufficient reliability among those arriving at diagnoses. Indeed, when employing this particular measurement approach with athletic performers, sport psychologists in this area should incorporate tests of inter-rater reliability to ensure adequate consistency among interviewers.

The third strategy of measuring positive adaptation involves the integration of scores across different domains of adjustment. As with summative approaches to measuring risk, a crucial requirement in using this strategy is that individual domains of functioning must be carefully examined before scholars derive an overall competence index. To illustrate, when investigating school-based behavioral competence among inner-city adolescents, Luthar and McMahon (1996) examined four component dimensions within two composite constructs:

peer acceptance (high popularity and low isolation) and prosocial leadership (high prosocial orientation and low aggressiveness). Interestingly, while using this aggregated approach, they found that a reputation of popularity characterized disruptive bullies to a similar extent as it did prosocial leaders. Thus, although peer acceptance may be considered to be a desirable resilience-related attribute in teenage groups, it would be inappropriate to use popularity to connote behavioral competence in this particular population.

A related concern of this measurement strategy pertains to the issue of circularity pervasive in resilience research (Harvey & Delfrabro, 2004; Kinard, 1998; Luthar & Zelazo, 2003; Masten & Obradovic, 2006; Windle, 2011). Specifically, the distinction between antecedent (protective) factors and positive outcomes is often blurred in the resilience literature. To illustrate, good peer relationships is sometimes considered to be a factor that predicts competence (Seidman & Pedersen, 2003) and is sometimes deemed to be an outcome of positive adaptation (Bolger & Patterson, 2003). In a similar fashion, self-efficacy has been considered to be both a precursor and a consequence of resilience (Kinard, 1998). Whichever approach is taken, scholars need to provide a clear justification of their decision and should reflect high relevance to the specific research question being addressed. In an athletic context, for example, high self-efficacy might be seen as a protective factor when exploring the ramifications of confidence for athletes' performance and well-being. In contrast, improvements in self-efficacy might be considered to be a positive outcome if sport psychology researchers sought to understand what helps injured athletes obtain confidence after experiencing such an incident. Indeed, Luthar and Zelazo (2003) remarked that "the interchangeable examination of constructs as predictors and as outcomes should not be seen as reflecting confusion in the resilience literature; quite to the contrary, it is essential for advancing scientific knowledge" (pp. 516-517).

2.13 Measuring protective factors. The thrust of early research examining resilience involved the search for factors that protected an individual from the stressors they encountered (see, for a review, Luthar, 2006). To illustrate, Garmezy (1991) unearthed characteristics of young people who thrived whilst living in difficult circumstances and he subsequently clustered the identified resilient qualities around three key themes: dispositional attributes (i.e., personality) of the individual, family cohesion and warmth, and the availability and utilization of social support. As briefly mentioned earlier, these "resilient qualities" have commonly been referred to as protective factors in the psychology research literature. Protective factors have been defined as "influences that modify, ameliorate, or alter a person's response to some environmental hazard that predisposes to a maladaptive

outcome" (Rutter, 1985, p. 600). This line of inquiry has provided significant contributions to the assessment of resilience by addressing the question: What characteristics help people flourish in adversity? During the past three decades, over a dozen measures of resilience have been developed and validated by various researchers (see, for a review, Windle, Bennett, & Noyes, 2011). Importantly, these instruments have predominantly focused on assessing a constellation of characteristics that enable individuals to adapt to the demands they encounter. Drawing directly from current resilience scales in other psychology sub-disciplines, six psychometric issues will be explored and discussed forthwith related to the assessment of protective factors.

The first problem with this approach is that the majority of measures focus on resilient qualities at the level of the individual only (Ahern, Kiehl, Sole, & Byers, 2006; Naglieri & LeBuffe, 2005; Windle et al., 2011). For example, items on the Connor-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007; Connor & Davidson, 2003) solely tap into personal factors of resilience including control, commitment, challenge, adaptability, and problem-solving. Furthermore, the Resilience Scale (RS; Wagnild & Young, 1993) assesses five resilient characteristics exclusively based at the individual level: equanimity, perseverance, self-reliance, meaningfulness, and existential aloneness. Whereas features of the individual are undoubtedly important for positive adaptation in the face of adversity, the availability of resources from family (e.g., close bonds with at least one parent) and the community (e.g., support from peers) are also invaluable (see e.g., Collishaw et al., 2007; Horton & Wallander, 2001). When considering resilience across different levels of analysis, scholars need to be aware that the meaning of constructs may differ (Zautra, Hall, & Murray, 2008). Zautra et al. (2008) cited the example of trust; a factor that has been found to be an important aspect of resilience in elite sport (Fletcher & Sarkar, 2012). Specifically, they argued that although this quality is best understood at the level of the person in terms of his or her social interactions, trust may be best characterized by cohesiveness and collaborative ties at the family and community levels respectively. To gain a better understanding of resilience in sport performers, the development of a measurement instrument capable of assessing a range of protective mechanisms within multiple domains represents the optimal approach for advancing the field.

The second concern relates to the limited evidence base for the selection of items within current measures of resilience (Atkinson, Martin, & Rankin, 2009; Davydov et al., 2010). For example, the Brief Resilient Coping Scale (BRCS; Sinclair & Wallston, 2004) was developed solely using Polk's (1997) classification of resilience phenomenon. Although a

conceptual framework underpinned the instrument, the authors did not provide a justification as to why this particular perspective was prioritized over others. Furthermore, although the content of the CD-RISC was drawn from a number of different peer-reviewed sources (e.g., Kobasa, 1979; Lyons, 1991; Rutter, 1985), Connor and Davidson (2003) also included putative resilience factors – with questionable theoretical basis – based on the memoirs of Sir Edward Shackleton's expedition in the Antarctic in 1912 (Alexander, 1998). In relation to instrument development, Davydov et al. (2010) mentioned that measures include different constructs according to researchers' own views on resilience and its underlying meaning. To illustrate, the Brief Resilience Scale (BRS; Smith et al., 2008) was solely derived from a dictionary definition of resilience (the ability to "bounce back" or recover from stress) favored by the lead author. Hence, the items included in this measure, such as 'I tend to bounce back quickly after hard times' and 'it is hard for me to snap back when something bad happens', are based on a somewhat narrow conceptualization of resilience. When developing a resilience scale for sport performers, researchers need to clearly justify their approach to item development and, perhaps most importantly, they should exploit the vast empirical knowledge in key resilience-related areas.

The third issue with measuring protective factors is that the qualities assessed are specific to the context in which they arise and cannot be easily generalized to other populations (Davydov et al., 2010; Ungar et al., 2008). For example, the Suicide Resilience Inventory-25 (SRI-25; Osman et al., 2004) assesses characteristics that dissuade individuals from considering suicide as an option. Moreover, the Trauma Resilience Scale (TRS; Madsen & Abell, 2010) specifically assesses protective factors associated with positive adaptation following violence. Indeed, all the resilience inventories to date have been developed for use in non-sport contexts, such as psychiatric patients (see, e.g., Connor & Davidson, 2003; Madsen & Abell, 2010; Osman et al., 2004). This is particularly problematic for sport psychology researchers since constructs that are meaningful to non-sport participants, such as spirituality in clinical samples, are unlikely to be entirely relevant to athletic performers (cf. Fletcher & Sarkar, 2012). Gucciardi et al. (2011) recently argued that "important protective (e.g., teammate support) and vulnerability (e.g., rigorous training schedules) factors are likely not to be adequately captured when using [current resilience] measures . . . that were developed with other populations in mind" (p. 431). Hence, as a prerequisite to developing a sport-specific measure of resilience, scholars need to comprehensively review risk and protective factors in the context of athletic performance.

The fourth problem concerns the validity of current scales purporting to assess

resilient qualities. More specifically, a number of inventories measure phenomena that are related to resilience but are conceptually distinct from the construct. For example, the BRS provides a measure of recovery from stress and the BRCS and the CD-RISC were designed to assess an individual's stress-coping ability. Whereas recovery and coping are often discussed in relation to resilience, and sometimes used interchangeably with the term, there is growing evidence to suggest that they should be conceived as conceptually distinct from resilience (see, for a review, Fletcher & Sarkar, 2013). To provide further illustrations, the Dispositional Resilience Scale (DRS; Bartone, Ursano, Wright, & Ingraham, 1989) presents a measure of hardiness and the Ego-Resiliency Scale (ER89, Block & Kremen, 1996) was developed to assess ego-resiliency. Although both constructs share a number of similarities with the attributes of resilience, they do not contain all of the relevant features (Windle, 2011). In addition, as Windle (2011) noted, both hardiness and ego-resiliency are considered to be stable personality traits, whereas resilience is deemed to be a dynamic process that changes over time. Accordingly, it is important that future measures in this area distinguish resilience from a number of related terms to ensure that they do not divert researchers' attention from examining the true nature of resilience.

The fifth issue with this approach is that a set of questions at a single point in time may only capture state characteristics as opposed to assessing an individual's thoughts, feelings and behavior throughout the entire process of dealing with adversity. Based on this premise, Hoge, Austin, and Pollack (2007) argued that "a true resilience scale would measure an individual's reaction to an experimental stress paradigm or to stressful life events or traumas over time" (p. 147). In view of this proposition, it is worth noting that longitudinal studies are important in determining the stability of resilience across an individual's lifespan (Heller et al., 1999; Kinard, 1998; Luthar, 2006; Walsh et al., 2010; Windle, 1999). Indeed, in the sport psychology literature, there is a consensus that longitudinal research is needed to investigate resilient characteristics and performance throughout the entire process of managing potentially stressful situations (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). In relation to developing and validating a sport-specific measure of resilience, Gucciardi et al. (2011) argued that it is crucial that researchers explore the factor structure stability and item consistency in a longitudinal fashion. Moreover, when employing a prospective research design, it has been proposed that scholars should ideally obtain measurements on at least three separate occasions, with assessments spaced far enough in time to enable the hypothesized protective factors to exert their effects (Luthar et al., 2000). To illustrate, in the context of sport performance, it would be useful to assess an athlete's

resilient qualities before, during, and after an adverse event (e.g., serious injury) to determine any potential changes in the relationship between stressors and positive adaptation (e.g., performance and well-being). Indeed, utilizing a longitudinal design when researching this desirable construct represents a useful approach that is consistent with the conceptualization of resilience as a dynamic process of positive adaptation to adversity (Luthar, 2006).

The sixth problem with exclusively assessing resilient qualities relates to the limited knowledge gleaned regarding the relationship between protective factors and stressors. Specifically, current measures of resilience predominantly focus on the sole assessment of variables that are implicitly assumed to be associated with positive adaptation in the face of adversity (Olsson et al., 2003). However, without the simultaneous measurement of context-specific stressors, this connection cannot be corroborated. Examining the interplay between resilient characteristics and adverse events is an important aspect of resilience research since it highlights the processes underlying vulnerability or adaptation (Luthar & Zelazo, 2003; Naglieri & LeBuffe, 2005; Rutter, 2006; Windle, 2011). Indeed, Rutter (2006) argued that "resilience is an interactive concept that can only be studied if there is a thorough measurement of risk and protective factors" (p. 3).

Before sport psychology researchers investigate the associations between risk and protective factors, they need to consider a number of psychometric issues depending on which of the two main strategies – variable-focused or person-focused – are employed (see, for a review, Windle, 1999). When examining the relationships between adversity, protective factors, and competence (i.e., variable-focused approaches), measurement issues pertain to the reliance on statistics to detect such interactive processes (Luthar & Cushing, 1999). Firstly, multivariate analyses convey nothing about how many individuals within a particular sample meet the dual criteria of high risk and high competence. In addition, when using this strategy, it is difficult to isolate which (specific) risk and protective factors are contributing to the interaction and to the inferred resiliency processes. Secondly, when resilience studies involve interactive concepts there are potential problems with the instability of findings. More specifically, the sheer number of risk and protective factors may substantially reduce statistical power given that interaction effects in statistical models are typically associated with small effect sizes and as a result, are notoriously unstable (see, Rutter, 1983, for detailed discussions of this issue). When isolating a subset of individuals who have experienced high risk and demonstrated high competence (i.e., person-focused approaches), empirical studies of resilience are less prone to statistical fallacies. Notwithstanding the benefit of individual-based measurement, there is a concern regarding the variations in stringency for categorizing

individuals as resilient (Luthar & Cushing, 1999). To illustrate, whereas some investigators have provided labels of resilience among high-risk individuals if their competence scores were in the top 16% (+1SD) of the research sample (see, e.g., Cicchetti, Rogosch, Lynch & Holt, 1993), others have employed competence cut-off scores based on quartiles or thirds of distributions (see, e.g., Flores, Cicchetti, & Rogosch, 2005). To help reduce ambiguities that may arise due to variations in quantitatively delineated resilience, qualitative analyses of exemplar resilient individuals can provide a valuable addition in elucidating the nature of this complex psychological phenomenon.

2.14 Concluding remarks. There is a consensus in the sport psychology literature that a measure of psychological resilience in athletes is needed to advance researchers' understanding of this desirable construct (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). Drawing on the broader psychometric literature in this area, this review has discussed a variety of measurement approaches and issues in the empirical study of resilience. Hopefully, part one has helped to explain how psychological resilience should be measured in sport performers. The key recommendations to emerge from this discussion, for sport psychology researchers seeking to develop a measure of psychological resilience in athletes, are that:

- Measures of resilience need to consider three pivotal components – adversity, positive adaptation, and protective factors – in a tripartite fashion. Importantly, due to the fundamentally distinct nature of these concepts, researchers need to separately assess and analyze adversity, positive adaptation, and protective factors from the outset.
- To gain a comprehensive picture of adversity, researchers should assess both significant life events and ongoing daily stressors.
- Researchers should provide empirical evidence of the associations between scores on an adversity measure and other conceptually related indices.
- When assessing adversity, items that could be construed as clearly controllable by athletes should ideally be excluded from potential measures.
- Relying on athletes to judge the severity of adverse events themselves could potentially lead to spurious conclusions. Frequency counts will avoid potential ambiguities in measuring adversity.
- Whereas an examination of distal risks can yield critical insights on successful adaptation in the face of adversity, it is also invaluable for scholars to scrutinize the proximal processes underlying the specific distal risks.

- When assessing constellations of multiple risks, researchers should be attentive to each of the individual items included within a composite measure of adversity to determine if they do, in fact, represent high risk for athletes.
- When employing multiple-item instruments to assess competence, little is known about how the most competent (resilient) individuals within the sample compare with those in low-risk groups. Ambiguities in this context can be partially addressed by providing qualitative characterizations of a subset of individuals within the group being examined.
- Indices used to assess positive adaptation should be specific to the particular risk under scrutiny in terms of domains assessed and stringency of criteria used. Among competitive athletes, excellence in subjective sport performance and global well-being are likely to be of particular relevance.
- Sport personnel assessing psychiatric symptoms in athletes should be provided with appropriate clinical training to ensure that there is sufficient reliability among those arriving at diagnoses.
- Individual domains of functioning should be carefully examined before researchers derive an overall competence index.
- Scholars should provide a clear justification of their decision to examine constructs as either predictors or outcomes and should reflect high relevance to the specific research question being addressed.
- Researchers need to: assess a range of protective factors across different levels of analysis, clearly justify their approach to item development, comprehensively review risk and protective factors in the specific context of sport performance, distinguish resilience from a number of related terms, utilize a longitudinal design, and examine the interplay between stressors and protective factors.

It is hoped that these psychometric lessons gleaned from general psychology will provide the platform for generating an accurate and reliable measure of psychological resilience in sport performers. The breadth of measurement strategies within the wider resilience research is indeed critical for the refinement of future measures in this area:

> The mélange of empirical approaches across the last two decades allows for a more fine-grained scrutiny than has been heretofore possible, in honing in on central principles . . . regarding risk, competence, and the associations between these and protective forces (Luthar & Cushing, 1999, p. 152).

Part Two: Psychological Resilience in Sport Performers: A Review of Stressors and Protective Factors [2]

In part two of this chapter, I discuss psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands. It is hoped that synthesizing what is known in these areas will help researchers gain a deeper profundity of resilience in sport, and also provide a rigorous and robust foundation for the development of a sport-specific measure of resilience.

2.2 Introduction

The sporting arena represents a 'natural laboratory' to study how individuals operate and perform in highly demanding circumstances. Top-level sport is characterized by the ability of athletes to utilize and optimize a range of psychological qualities to withstand the pressures that they experience (Fletcher & Sarkar, 2012; Gould et al., 2002). Over the past few decades, researchers have identified numerous stressors that sport performers encounter (see, e.g., McKay et al., 2008; Scanlan, Stein, & Ravizza, 1991) and explored the role of psychological characteristics in helping elite performers adapt to setbacks and transitions encountered along the pathway to excellence (MacNamara, Button, & Collins, 2010a; 2010b). The influence of psychological factors within the context of the stress process is broadly conceptualized as psychological resilience (cf. Fletcher & Sarkar, 2013).

The study of psychological resilience seeks to understand why some individuals are able to withstand – or even thrive on – the pressure they experience in their lives. Fletcher and Sarkar recently defined psychological resilience as "the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors" (2012, p. 675; 2013, p. 16). This definition extends previous conceptual work in this area in a number of ways. First, the focus on *psychological* resilience delimits the scope of the description, by definition, to "mental processes and behavior" and excludes other types of resilience such as physical, molecular, and structural resilience. Second, this definition encapsulates aspects of both trait and process conceptualizations of resilience (cf. Fletcher & Sarkar, 2012, 2013). Regarding the trait conceptualization, the

[2] **Sarkar, M.**, & Fletcher, D. (2013, December). *Psychological resilience in sport performers: A review of stressors and protective factors.* Poster presented at the 3rd Biennial Meeting of the British Psychological Society's Division of Sport and Exercise Psychology, Manchester, UK.

Sarkar, M., & Fletcher, D. (2014). Psychological resilience in sport performers: A review of stressors and protective factors. *Journal of Sports Sciences, 32*, 1419-1434.

"mental processes and behavior" enable individuals to adapt to the circumstances they encounter (cf. Connor & Davidson, 2003). The process conceptualization of resilience recognizes that it is a capacity that develops over time in the context of person-environment interactions (Egeland et al., 1993). Central to the definition is the focusing of the conceptual lens on the *role* that psychological-related phenomena play – rather than the mental processes and behavior per se – in avoiding negative consequences. Third, the emphasis is placed on the more neutral term "stressor" rather than the negative value-laden term "adversity" (cf. Fletcher & Sarkar, 2013). Fourth, the focus is on "promoting personal assets and protecting an individual from the potential negative effect of stressors" rather than positive adaptation per se, because resilience generally refers to the ability of individuals to maintain normal levels of functioning rather than the restoration or enhancement of functioning (cf. Bonanno, 2004). Although not directly related to the presented definition, a relevant conceptual debate in this area is the comparison between psychological resilience and other potentially related constructs. The interested reader is directed to relevant papers that discuss the similarities and differences between resilience and other psychological phenomena such as mental toughness (see Gucciardi & Gordon, 2009; Gucciardi, Gordon, & Dimmock, 2008, 2009), hardiness (see Howe, Smajdor, & Stockl, 2012; Windle, 2011), recovery (see Bonnano, 2004; deRoon-Cassini, Mancini, Rusch, & Bonanno, 2010; Deshields et al., 2006; Lam et al., 2010), and coping (see Campbell-Sills et al., 2006; Major et al., 1998; Van Vliet, 2008).

In terms of the extant resilience research, studies have sampled children, adults and families who have overcome significant adversities in their lives, including the death of a parent (Greeff & Human, 2004), childhood sexual abuse (Bogar & Hulse-Killacky, 2006), and terrorism (Bonanno et al., 2007). When considering the adversity experienced by study participants, resilience researchers have tended to employ a threshold-dependent conception by defining adversity in terms of statistical probabilities; that is, the focus is on negative life events that are statistically associated with maladjustment, an approach that is closely aligned to the notion of risk (Fletcher & Sarkar, 2013). Due to the contextual specificity of resilience (cf. Luthar et al., 2000), the findings of many studies in this area are not easily applicable to elite athletes who actively choose to participate in competitive sport and engage with its inherent demands largely of their own volition (cf. Fletcher & Sarkar, 2012).

Over the past few years, researchers have begun to specifically investigate psychological resilience in sport performers (e.g., Fletcher & Sarkar, 2012; Galli & Vealey, 2008). In one of the initial sport resilience studies, Galli and Vealey (2008) interviewed college and professional athletes' about their perceptions and experiences of resilience. Four

different adversities were identified: injury, performance slump, illness, and career transition. The findings revealed various personal resources and socio-cultural factors that influenced the athletes' efforts to manage the unpleasant emotions and mental struggles associated with the adversities. Resilient qualities included positivity, determination, competitiveness, commitment, maturity, persistence, passion for the sport, and strong networks of social support. During the interviews, the athletes were asked to describe the biggest obstacle they had faced in trying to be successful in their sport and the remainder of the interview flowed from the response to this initial question on identifying one type of adversity. As noted by Galli and Reel (2012), this was perhaps an oversimplification of the participants' sport experiences given that athletes typically encounter multiple challenges simultaneously rather than in isolation. Another point worth highlighting is that Galli and Vealey (2008) recognized that further knowledge of the resilient qualities that enable sport performers to positively adapt to stressors is necessary to enhance understanding of resilience in sport.

In the most recent sport resilience study, Fletcher and Sarkar (2012) interviewed twelve Olympic champions to explore and explain the relationship between psychological resilience and optimal sport performance. They found that Olympic gold medalists encountered a wide variety of different stressors, ranging from ongoing daily demands (e.g., balancing work and training) to major life events (e.g., the death of a close family member). The emergent grounded theory (see Figure 1) indicated that the world's best athletes protect themselves from the potential negative effect of stressors by influencing their challenge appraisal and meta-cognitions. These constructive cognitive reactions promoted facilitative responses that appeared to be firmly embedded in taking personal responsibility for one's thoughts, feelings, and actions. In turn, positive responses led to the realization of optimal sport performance. Importantly, Olympic champions possess several psychological-related phenomena (relating to a positive personality, motivation, confidence, focus and perceived social support) that underpin the resilience-stress-performance relationship.

In the majority of sport resilience studies, it is worth noting that the authors have identified a need for a measure of psychological resilience in athletic performers to advance sport psychologists' understanding of this area. To further enhance researchers' knowledge of measuring resilience in athletes, and in line with a recommendation by Gucciardi et al. (2011), in part one of this chapter, I reviewed psychometric issues in resilience research and considered the implications for sport psychology. Importantly in the context of the present discussion, I contended that examining the interplay between stressors and protective factors is essential since it focuses the analytical lens on the processes underlying adaptation or

vulnerability (see also Luthar & Zelazo, 2003; Naglieri & LeBuffe, 2005; Rutter, 2006; Windle, 2011). The importance of the context was recently emphasized by Gucciardi et al. who argued that "important protective (e.g., teammate support) and vulnerability (e.g., rigorous training schedules) factors are likely not to be adequately captured when using [current resilience] measures . . . that were developed with other [than sport] populations in mind" (p. 431). Hence, before developing a sport-specific measure of resilience, I recommended, in part one of this chapter, that researchers utilize the empirical knowledge base in the pivotal resilience-related areas of stressors and protective factors.

In part two of this chapter, I discuss psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands. To the best of my knowledge, this is the first review of resilience in sport. It is hoped that synthesizing what is known in these areas will help researchers gain a deeper profundity of resilience in sport, and also provide a rigorous and robust foundation for the development of a sport-specific measure of resilience. Indeed, Rutter (2006) observed that "resilience is an interactive concept that can only be studied if there is a thorough measurement of risk and protective factors" (p. 3). I undertook a narrative review to allow for extensive coverage of psychological resilience in sport performers. A systematic review was not considered appropriate due to the broad nature of the research topic (cf. Davydov et al., 2010). Indeed, this is reflected in the general psychology literature which currently does not have any published systematic reviews of resilience, but numerous narrative reviews (see, e.g., Davydov et al., 2010; Fletcher & Sarkar, 2013; Luthar & Zelazo, 2003; Windle, 2011). Furthermore, in an editorial entitled, 'Balancing the strengths of systematic and narrative reviews', Collins and Fauser (2005) remarked:

> The primary problem is that the narrow focus and prescribed methods of the systematic review do not allow for comprehensive coverage. [Certain] topics . . . require the wider scope of a traditional narrative review, in which less explicit methods are the trade-off for broader coverage (pp. 103-104).

The narrative is divided into two main sections. The first section reviews the different types of stressors encountered by sport performers under three main categories: competitive, organizational, and personal. Based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience in Olympics champions, the second section discusses the five main families of psychological factors (viz. positive personality, motivation, confidence, focus,

perceived social support) that protect the best athletes from the potential negative effect of stressors. The review is organised around this model because it is the only sport-specific theory of resilience, grounded in original data, which is free from the constraints of a preconceived model. In line with the narrative review approach adopted in part two of this chapter, studies were selected based on situational choices about the inclusion of evidence (cf. Collins & Fauser, 2005; Dijkers, 2009). In this review, studies were selected that significantly advanced researchers' knowledge of the stressors encountered by competitive athletes and enhanced researchers' understanding of withstanding stress and pressure in competitive sport.

2.21 Stressors. Fletcher and Sarkar (2013) recently observed that when researchers investigate how individuals' positively adapt to difficult life events, adversities or risks are predominantly considered; that is, resilience researchers focus on negative life circumstances that are known to be statistically associated with adjustment difficulties (cf. Luthar et al., 2000). They went on to argue that this threshold-dependent approach is somewhat limited since it typically precludes the inclusion of many highly taxing, yet still common, events. This is pertinent for the sport context since athletes often experience regular everyday hassles that are embedded in their sporting lives, such as relationship problems, inadequate preparation, and logistical issues (see, e.g., Thelwell et al., 2007). Moreover, although the term "adversity" associates negative circumstances with negative consequences, ostensibly positive life experiences – that are *not* typically associated with a higher probability of undesirable outcomes – are also relevant in resilience research (Fletcher & Sarkar, 2013). To illustrate, in a sport context, winning an important competition is unlikely to be labeled as an adversity but will nonetheless require individuals to positively adapt to the inevitable heightened expectations related to success (cf. Kreiner-Phillips & Orlick, 1993). On the basis of these arguments, in part one of this chapter, I proposed that when measuring resilience in sport performers researchers should assess both significant life events and ongoing daily hassles. Thus, to allow different types of situations, circumstances, and experiences to be included under the rubric of resilience, the more neutral term "stressor" is employed here and defined as "the environmental demands (i.e., stimuli) encountered by an individual" (Fletcher et al., 2006, p. 359).

Over the past couple of decades or so, sport psychology researchers have unearthed a wide range of stressors encountered by sport performers (see, e.g., Gould, Jackson, & Finch, 1993; McKay et al., 2008; Mellalieu et al., 2009; Noblet & Gifford, 2002; Scanlan et al., 1991; Thelwell et al., 2007; Weston, Thelwell, Bond, & Hutchings, 2009; Woodman &

Hardy, 2001). Collectively, the stressors identified in these studies have been associated with competitive performance, the sport organization within which athletes operate, and personal "nonsporting" life events (Fletcher et al., 2006). Based on this classification, the following subsections will review and synthesize the stressors experienced by athletes in each of these respective categories.

2.211 *Competitive stressors*. Competitive stressors are defined as "the environmental demands associated primarily and directly with competitive performance" (Mellalieu, Hanton, & Fletcher, 2006, p. 3). Sport psychology researchers identified performance-related stressors in a number of early exploratory studies (e.g., Gould et al., 1993; Holt & Hogg, 2002; James & Collins, 1997). More recently, scholars have investigated competitive stressors in a more systematic fashion (see, Hanton, Fletcher, & Coughlan, 2005; Mellalieu et al., 2009; Neil, Hanton, Mellalieu, & Fletcher, 2011). Based on the collective findings of these studies, stressors experienced in relation to competitive performance include preparation, injuries, pressure, underperforming, expectations, self-presentation, and rivalry.

Demands related to preparation for competition have been frequently cited by the majority of athletes in studies exploring the different types of environmental demands (see, e.g., Weston et al., 2009). Specifically, sport performers have identified how various aspects of their preparation (physical, mental, technical, and tactical) were at times inadequate, inappropriate, or arduous prior to competition. Another common stressor, experienced by a variety of athletic populations, has been sport-related injuries (see, e.g., Gould, Udry, Bridges, & Beck, 1997). Injury-related pressures include the risk of sustaining an injury, the risk of being deliberately injured due to an opponent's actions, the act of getting injured, determining the cause of injury, the inability to train, missing important competitions, loss of fitness, attaining pre-injury levels of performance, and competing whilst injured (see Evans, Wadey, Hanton, & Mitchell, 2012). In addition, athletes have reported the pressure to perform well at competition (see, e.g., McKay et al., 2008). To illustrate, sport performers have identified the demands of international competition, performing under pressure, and the pressure to beat others. Furthermore, underperforming in competition has been a frequent demand encountered by a variety of sport performers (see, e.g., Dugdale, Eklund, & Gordon 2002). Specifically, athletes have reported pressures related to making mistakes or errors during performance, periods of limited progress, not achieving performance goals, poor personal and team performances, not performing as expected, a loss of form, and performance slumps.

One of the most common stressors experienced by athletes is performance

expectations (see, e.g., Gould et al., 1993). Internal expectations, that is, pressures that a performer places on his or her self as a result of external demands, include wanting to start well during competition, aspiring to perform to one's ability, and staying at the top of the rankings. External expectations, that is, pressures placed on a performer by an external source, include being the favorite for a competition, starting well for the benefit of the team, other people expecting you to do well, competing for a better ranking place, and competing on live television. Self-presentation issues have been repeatedly identified by numerous athletes (see, e.g., James & Collins, 1997). Frequently cited demands in this subcategory include the evaluation of performance from coaches and teammates, not wanting to let coaches and teammates down, wanting to look the part physically, the demonstration of ability, and seeking recognition. The final type of competitive stressor encountered by sport performers relates to the rivalry experienced as part of competition (see, e.g., Thelwell et al., 2007). Rivalry-related demands include competing against better athletes, opponents behaving deviously, and competing against up-and-coming opponents.

2.212 *Organizational stressors*. Organizational stressors are defined as "the environmental demands associated primarily and directly with the organization within which an individual is operating" (Fletcher et al., 2006, p. 359). In a number of early studies that identified different types of environmental demands, sport psychology researchers unearthed a variety of organizational-related stressors (see, e.g., Gould et al., 1993; Scanlan et al., 1991). Subsequently, scholars began to systematically investigate the organizational stressors encountered by athletic performers (see, e.g., Fletcher & Hanton, 2003; Fletcher, Hanton, Mellalieu, & Neil, 2012; Hanton et al., 2005; Kristiansen & Roberts, 2010; Woodman & Hardy, 2001).

To advance the body of knowledge in this area, Arnold and Fletcher (2012) recently synthesized the research that has identified the organizational stressors encountered by athletes and developed a taxonomic classification of these environmental demands. Using a meta-interpretation method, thirty-four studies (with a combined sample of 1809 participants) were analyzed and yielded 640 distinct organizational stressors. The demands were abstracted into 31 subcategories, which formed four categories: leadership and personal issues, cultural and team issues, logistical and environmental issues, and performance and personal issues. Leadership and personal issues consisted of the coach's behaviors and interactions, the coach's personality and attitudes, external expectations, support staff, sports officials, spectators, media, performance feedback, and the governing body. Cultural and team issues consisted of teammates' behaviors and interactions, communication, team atmosphere and

support, teammates' personality and attitudes, roles, cultural norms, and goals. Logistical and environmental issues consisted of facilities and equipment, selection, competition format, structure of training, weather conditions, travel, accommodation, rules and regulations, distractions, physical safety, and technology. Finally, performance and personal issues consisted of injuries, finances, diet and hydration, and career transitions.

Beyond the identification of stressors encountered by athletes, researchers in this area have explored the content and quantity of stressors in elite and non-elite sport performers. For example, Hanton et al. (2005) found that elite athletes experienced and recalled more demands associated primarily and directly with the sport organization than with competitive performance. Furthermore, this population appeared more likely to experience similar competitive stressors but varied organizational stressors, perhaps because the former are typically common to most athletes' experiences of performance, whereas the latter are generally disparate and subject to numerous sociocultural, political, economic, occupational, and technological influences. More recently, Fletcher et al. (2012) compared the frequency and content of organizational stressors between elite and non-elite sport performers. They found that the higher skilled participants encountered more stressors than the lower skilled participants. The findings also suggested that across skill levels certain types of organizational stressors are experienced and recalled more frequently than others. More specifically, the elite performers mentioned travel and accommodation arrangements, income and funding, media attention, and a lack of participation in the decision-making process more often than their non-elite counterparts. To examine the potential negative effects of organizational stress on sport performers, Tabei, Fletcher, and Goodger (2012) investigated the relationship between organizational stressors and burnout in collegiate soccer players. Results revealed multiple organizational stressors linked to athlete burnout comprising training and competition load, training and competition environment, travel arrangements, nutritional issues, risk of injury, leadership style, lack of social support, career and performance development, inadequate communication channels, and role overload.

2.213 ***Personal stressors*****.** Personal stressors are defined as the environmental demands associated primarily and directly with personal "nonsporting" life events. Within this category, stressors encountered by sport performers include: the work-life interface, family issues, and the death of a significant other. Firstly, the work-life interface has been repeatedly identified as a stressor in the sport psychology literature (see, e.g., Gould et al., 1993). Youth athletes in the initial stages of their career have identified difficulties associated with academic commitments, and balancing educational goals with personal relationships

(see, e.g., McKay et al., 2008). Older athletes in the latter stages of their career have identified demands related to work commitments, specifically the difficulties of balancing personal relationships with a job (see, e.g., Noblet & Gifford, 2002). Within this subcategory, relocation-related pressures have also been recognized, including problems with finding suitable accommodation, missing family and friends, and adjusting to independent living (see, e.g., Giacobbi et al., 2004). Secondly, family issues have been a frequent demand encountered by a wide variety of athletes. Specifically, sport performers have faced financial pressures of having to provide for a family (see, e.g., Thelwell et al., 2007), relationship problems (see, e.g., Gould et al., 1993), family responsibilities (see, e.g., Weston et al., 2009), and a volatile family life at home (see, e.g., Scanlan et al., 1991). Thirdly, a number of sport performers have identified the death of a significant other. Some athletes have experienced the death of a family member (see, e.g., McKay et al., 2008) whereas others have experienced the loss of team members (see, e.g., Scanlan et al., 1991).

In summary, this section has reviewed the stressors encountered by sport performers under the following categories and subcategories: competitive performance (preparation, injuries, pressure, underperforming, expectations, self-presentation, and rivalry), the sport organization within which the athletes operate (leadership and personal issues, cultural and team issues, logistical and environmental issues, and performance and personal issues), and personal "nonsporting" life events (work-life interface, family issues, and the death of a significant other). By synthesizing the wealth of knowledge in this pivotal resilience-related area, across a large number and wide range of studies, it is anticipated that researchers will gain a more complete understanding of the stressors encountered in competitive sport. In the context of psychological resilience, and from an applied perspective, it is crucial that individuals' immediate environment is carefully managed to optimize the stressors they encounter in their lives. Traditionally, there has been a tendency to assume that negative situations and circumstances impede positive adaptation. However, Seery et al. (2010) recently found that people with a history of some lifetime adversity reported better mental health and well-being outcomes than people with no history of adversity (see also Neff & Broady, 2011; Seery, 2011b). Drawing from theories of stress inoculation (Meichenbaum, 1985), it has been suggested that exposure to stressors in moderation can mobilize previously untapped resources, help engage social support networks, and create a sense of mastery for future stressors. Thus, where possible, aspiring high performers should be encouraged to actively seek out challenging situations since this will make subsequent demands seem more manageable (cf. Sarkar & Fletcher, 2014a), leading to improvements in performance (see,

e.g., Arnetz, Nevedal, Lumley, Backman, & Lublin, 2009).

2.22 Protective factors. Within the field of psychology, early research examining resilience represented a "paradigm shift from looking at risk factors that led to psychosocial problems to the identification of strengths of an individual" (Richardson, 2002, p. 309). Increasingly, researchers focused on identifying the characteristics of individuals, particularly young people, who thrived whilst living in difficult circumstances, such as poverty and parental mental illness (Garmezy, 1991; Rutter, 1990; Werner & Smith, 1992). Examples of such qualities were: an easy temperament, good self-esteem, planning skills, and a supportive environment inside and outside the family. These qualities have been referred to as protective factors, which Rutter (1985) defined as "influences that modify, ameliorate, or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome" (p. 600). Since the publication of this work, numerous protective factors have been identified in the resilience research literature, including hope (Horton & Wallander, 2001), extraversion (Campbell-Sills et al., 2006), optimistic explanatory style (Kleiman et al., 2013), self-efficacy (Gu & Day, 2007), spirituality (Peres et al., 2007), and social support (Brown, 2008). In the context of the present discussion, it is worth noting that a constellation of these factors, that protect individuals' from the stressors they encounter, are assessed in the majority of resilience instruments to date (Windle et al., 2011).

In my review of psychometric issues in resilience research, in part one of this chapter, I explored and discussed various issues pertaining to the measurement of protective factors in sport performers. Perhaps most importantly, I argued that the protective factors assessed in current measures of resilience are specific to the context in which they arise and cannot be easily generalized to other populations. Indeed, when considering the implications for sport psychology, I observed that all of the resilience inventories to date have been developed for use in non-sport contexts, such as psychiatric patients (see, e.g., Connor & Davidson, 2003; Madsen & Abell, 2010; Osman et al., 2004). This is particularly problematic for sport psychology researchers since qualities that are meaningful in non-sport participants are unlikely to be entirely relevant to athletic performers (Gucciardi et al., 2011). In light of these arguments, in part one of this chapter, I proposed that as a prerequisite to developing a sport-specific measure of resilience, scholars need to comprehensively review protective factors in the specific context of athletic performance. Based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience in Olympics champions, this section will review the five main families of psychological factors (viz. positive personality, motivation, confidence, focus, perceived social support) that the best athletes utilize and optimize to withstand the

stressors they encounter.

2.221 ***Positive personality*****.** Personality traits have been defined as "the relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, 2009, p. 140). Fletcher and Sarkar (2012) found that Olympic gold medalists possessed numerous positive personality characteristics, which influenced the resilience-related mechanisms of challenge appraisal and meta-cognition. Indeed, certain dispositional qualities have been frequently associated with sporting excellence by influencing athletes' cognitive processing in a positive fashion (Gould & Maynard, 2009). The main personality traits that have been found to have a desirable impact on athletes' reactions and responses are: adaptive perfectionism, optimism, competiveness, hope, and proactivity.

Adaptive perfectionism is a healthy type of perfectionism that is characterized by having high personal standards and striving for excellence but, at the same time, having little concern for mistakes and doubts about actions (see, for a review, Stoeber & Otto, 2006). Studies have found that features of adaptive perfectionism are associated with positive attitudes, processes, and outcomes, such as mastery and performance approach goals (see Stoeber, Stoll, Pescheck, & Otto, 2008), competitive self-confidence (see Stoeber, Otto, Pescheck, Becker, & Stoll, 2007), self-serving attributions of success and failure (see Stoeber & Becker, 2008), lower levels of anxiety (see Stoeber et al., 2007), and lower levels of burnout (see Hill, Hall, Appleton, & Kozub, 2008).

Optimism has been defined in two main ways: as a trait-like expectancy for successful outcomes (Scheier & Carver, 1985) and as an approach to explaining positive and negative events (Peterson, 2000). Based on the first conception, dispositional optimism has been linked with lower levels of pre-competition anxiety (Wilson, Raglind, & Pritchard, 2002), better emotional adjustment during sport competition (Gaudreau & Blondin, 2004), and task-oriented coping following a performance slump (Grove & Heard, 1997). In line with the second conception, athletes with an optimistic explanatory style (i.e., those who usually explain bad events with unstable, contextual, and external causes) have been found to bounce back after failure (Coffee & Rees, 2011; Coffee, Rees, & Haslam, 2009; Martin-Krumm et al., 2003). To illustrate, using an experimental design, Martin-Krumm et al. (2003) examined the relationship between explanatory style and resilience in a group of recreational basketball players. Following failure feedback in a dribbling task, optimistic participants were found to be more confident, less anxious, and perform better, than pessimistic participants.

Competiveness has been described as the desire to win in interpersonal situations (Gill

& Deeter, 1988). Using the Sport Orientation Questionnaire (Gill & Deeter, 1988), research has shown that a competitive orientation is positively related to outcome self-efficacy (Martin & Gill, 1991) and facilitative interpretations of anxiety (Jones & Swain, 1992). With regards to this latter study, and particularly important in the context of psychological resilience, Jones and Swain (1992) found that competitive athletes reported their anxiety as more facilitative and less debilitative for performance than less competitive athletes. In addition, based on interviews with elite sport performers, competitiveness has recently been found to play an important role in adapting to setbacks (e.g., injuries, performance slumps) that are encountered along the pathway to sporting excellence (MacNamara et al., 2010a; 2010b).

Hope is defined as "a cognitive set that is based on a reciprocally derived sense of successful (a) agency (goal-directed determination) and (b) pathways (planning of ways to meet goals)" (Snyder et al., 1991, pp. 570-571). High-hope individuals are able to envision alternative routes in the face of goal blockage, develop multiple strategies for overcoming obstacles, and display high levels of dedication and energy in pursuing desirable goals (see Snyder, Lehman, Kluck, & Monsson, 2006). Surprisingly, empirical investigations of hope in the sport domain are scarce. Using the Dispositional and State Hope Scales (Snyder et al., 1991; 1996), Curry, Snyder, Cook, Ruby, and Rehm (1997) found that sport performers with higher hope performed better academically and athletically after controlling for other possible influences such as self-esteem, mood, and confidence. More recently, Gustfasson, Hassmen, and Podlog (2010) found that feelings of high hope were associated with lower perceptions of burnout among sport performers. By enabling athletes to develop their strengths, to mobilize effort, and to pursue goal-attainment in the face of adversity, hope appears to be associated with better ability to withstand stress in competitive sport.

Proactivity has been defined as a "dispositional construct that identities differences among people in the extent to which they take action to influence their environments" (Bateman & Crant, 1993, p. 103). People who are proactive identify opportunities and act on them, show initiative, and persevere until they bring about meaningful change. Researchers have found a proactive personality to be an important characteristic in predisposing one to higher levels of achievement in various performance domains, including politics (Deluga, 1998), business (Seibert, Kraimer, & Crant, 2001), and sport (Fletcher & Sarkar, 2012). In one of the few sport studies in this area, Baker, Côté, and Deakin (2005) recognized this personal disposition in athletes and found that expert triathletes were more proactive in their preparation with a greater emphasis on thoughts related to their performance, whereas non-experts reported more passive thoughts unrelated to performance. In the context of

psychological resilience, research has found that a proactive disposition is an important attribute for withstanding the pressure associated with sport at the highest levels (Fletcher & Sarkar, 2012). Collectively, the research in these five areas suggests that positive personality traits are relevant to sport performers' resilience by influencing their reactions and responses in a positive fashion.

2.222 *Motivation*. The topic of motivation addresses the 'what' and 'why' of human behavior (cf. Deci & Ryan, 2000), and concerns "energy, direction, persistence and equifinality – all aspects of activation and intention" (Ryan & Deci, 2000, p. 69). Optimal levels of motivation are consistently reported as a required psychological attribute for withstanding stress and pressure in competitive sport (see, for a review, Standage, 2012; Treasure, Lemrye, Kuczka, & Standage, 2007). Fletcher and Sarkar (2012) found that Olympic champions had multiple motives for competing at the highest level including "being the best that you can be", social recognition, passion for the sport, achieving incremental approach goals, demonstrating competence, and proving their worth to others. Particularly important in the context of psychological resilience, Olympic gold medalists consciously valued and judged external demands as important and therefore actively chose to perform in challenging sport environments. This process of internalization and integration of regulations and values, whereby one's goals are brought into line with one's self identity, is central to self-determination theory (Ryan & Deci, 2000), and appears to be an important psychological asset that protects the best athletes from the potential negative effect of stressors.

Previous research that has examined the motivation of elite athletes has suggested that their behavior is not solely intrinsically motivated, that multiple motives are likely to exist, and that the social conditions defining one's participation are likely to have a significant effect on motivational processes. Chantal, Guay, Dobreva-Martinova, and Vallerand (1996) examined the motivational profiles of 98 elite Bulgarian athletes from a variety of sports using the Bulgarian version of the Sport Motivation Scale (Pelletier et al., 1995). They found that, in comparison with less successful athletes, the best performing athletes exhibited higher levels of non-self-determined types of motivation. Specifically, title holders and medal winners more frequently reported external rewards, feelings of obligation, and pressure as their primary sources of motivation. Interestingly, the authors suggested that the highly competitive sport structure that prevailed in Bulgaria at the time may have influenced the athletes' motivation in that the sport structure strongly emphasized winning at all costs. To provide a greater insight into the motivation of elite sport performers in less controlling social conditions, Mallet and Hanrahan (2004) explored the motivational processes of elite track

and field athletes in Australia using semi-structured interviews. They found that these individuals were characterized by multiple motivations that were both self-determining and non-self determining in nature. Although the interview data revealed excitement, enjoyment, and a sense of relatedness with fellow athletes as important motives, less self-determined reasons also emerged. Indeed, some of the athletes identified beating opponents, money, and social recognition as motives for competing at the highest level. The results of Mallett and Hanrahan's study, however, suggest that elite sport performers appear to be able to internalize and integrate more self-determined forms of extrinsic motivation. That is, they are gradually able to transform external regulations into self-regulation. More specifically, and particularly important in the context of psychological resilience, they find ways to evaluate and bring into congruence the environmental demands of the sport with their personally held values and beliefs.

A fundamental tenet of self-determination theory is that individuals engaged in an activity by choice will experience better consequences than those whose participation is less autonomous (see, Ryan & Deci, 2000). Indeed, in sport settings, autonomous motivation has been shown to predict adaptive outcomes, such as better well-being and vitality (Gagne, Ryan, & Bargmann, 2003), higher levels of flow (Kowal & Fortier, 1999), greater reported effort, interest, and persistence (Pelletier, Fortier, Vallerand, & Briere, 2001), and positive sportsmanship orientations (Ntoumanis & Standage, 2009). In the case of elite sport, however, a great deal of training can be uninteresting and, although essential to improving performance, extremely repetitive and monotonous. Nonetheless, research has demonstrated that even the most tedious aspects of training can be transcended through the use of interest-enhancing strategies that assist an individual's internalization of self-determined motivation regulations (Green-Demers, Pelletier, Stewart, & Gushue, 1998). The preceding research findings suggest that optimal motivation is an important asset for psychological resilience in sport performers. Specifically, possessing autonomous values and beliefs appear to have a positive influence on athletes' thought processes.

2.223 *Confidence*. Confidence has been identified as a positive influence for withstanding stress and pressure in competitive sport (Galli & Vealey, 2008; Gucciardi et al., 2011). In an athletic context, it is described as the degree of certainty one possesses about his or her ability to be successful in sport (Vealey, 1986). Confidence was deemed to be a particularly important factor underpinning the resilience-stress-performance relationship in Olympic champions (Fletcher & Sarkar, 2012). Various sources of confidence were salient to the world's best athletes, including multifaceted preparation, experience, self-awareness,

visualization, coaching, and teammates.

To explore this desirable construct in the specific context of athletic performance, Vealey, Hayashi, Garner-Holman, and Giacobbi (1998) examined the sources of sport confidence in high school and collegiate athletes. Using factor analysis techniques to develop a measure of sport confidence, they identified nine separate sources of sport confidence that grouped into three domains: achievement (mastery and demonstration of ability), self-regulation (physical/mental preparation and physical self-presentation), and social climate (sources of social support, coaches leadership, vicarious experience, environmental comfort, and situational favorableness). Building on this study in an elite sample of sport performers, Hays, Maynard, Thomas, and Bawden (2007) explored the sources and types of confidence salient to athletes who had medalled in at least one major championship (i.e., Olympic Games, World Championship and/or World Cup) using qualitative methods. Nine sources of confidence were identified: preparation, performance accomplishments, coaching, innate factors, social support, experience, competitive advantage, self-awareness, and trust. Analysis also revealed six types of sport confidence: skill execution, achievement, physical factors, psychological factors, superiority to opposition, and tactical awareness. Following on from this investigation, Hays, Thomas, Maynard, and Bawden (2009) examined the role of confidence in relation to the cognitive, affective and behavioral responses it elicits within the organizational subculture of world class sport. Qualitative analysis indicated that high sport confidence facilitated performance through its positive effect on athletes' thoughts, feelings, and behaviors. Specifically, high sport confidence was found to be synonymous with effective cognitions (e.g., focus on the task at hand), positive affect (e.g., enjoyment), and effective behaviors (e.g., confident body language).

In a review of this area, Vealey and Chase (2008) noted that solely possessing a general sport confidence may not be enough to perform successfully; rather, they argued that athletes need to possess robust confidence to overcome possible setbacks. Indeed, it has been suggested that the robust nature of confidence (i.e., the ability to maintain belief in the face of disconfirming experiences) may contribute to success over and above the contribution of the level of general sport confidence (where high levels are perceived as sufficient) (cf. Bull, Shambrook, James, & Brooks, 2005). In the first study to specifically explore this area, Thomas, Lane, and Kingston (2011) defined and contextualized the characteristics of robust sport confidence based on semi-structured interviews with elite sport performers. Robust sport confidence was defined as "a set of enduring, yet malleable positive beliefs that protect against the ongoing psychological and environmental challenges associated with competitive

sport" (p. 194). Qualitative data analysis procedures also resulted in the identification of six characteristics of robust sport confidence: multidimensional, malleable, durable, strength of belief, developed, and protective. This latter feature is particularly important in the context of psychological resilience since it indicates that robust sport confidence has the potential to act as a buffer against stressors. Building on this construct using quantitative methods, Beattie, Hardy, Savage, Woodman, and Callow (2011) developed and validated a Trait Robustness of Self-Confidence Inventory for use in competitive sport settings. The single-factor eight-item inventory, including questions such as "my self-confidence goes up and down a lot" and "if I perform poorly, my confidence is not poorly affected", was consistent across both male and female athletes. Regarding the predictive validity of the inventory, high robust confidence scores were associated with more stable self-confidence levels prior to competition, and athletes with high levels of robust confidence managed to maintain higher state self-confidence following disconfirming experiences than those with low robust confidence levels. In sum, both general and robust confidence are important psychological factors for withstanding stress and pressure in competitive sport. More specifically in the context of psychological resilience, general sport confidence appears to have a desirable impact on athletes' reactions and responses, and robust sport confidence seems to be particularly influential in protecting athletes from the potential negative effect of stressors.

2.224 *Focus*. Focus, or concentration, refers to a person's ability to exert deliberate mental effort on what is most important in any given situation (Moran, 1996). Fletcher and Sarkar (2012) found that the ability to focus was an important aspect of resilience for the world's best athletes. Specifically, Olympic champions were able to focus on relevant cues in the environment, maintain focus over long time periods, remain aware of the situation around them, and alter the scope of their attention as demanded by the situation.

Two main lines of inquiry illustrate the importance of focus and concentration. The first source of evidence comes from descriptive research exploring the psychological characteristics associated with athletes' ability to withstand – and thrive on – pressure when preparing and performing at major sporting events (see, e.g., Gould & Maynard, 2009). Indeed, numerous aspects of focus and concentration appear to be important for dealing with pressure and adversity in various competitive sport contexts (see, e.g., Bull et al., 2005; Gucciardi et al., 2008; Jones, Hanton, Connaughton, 2002; 2007). Specifically, elite athletes are able to withstand the pressure associated with sport at the highest level by: remaining fully focused on the task at hand in the face of distractions, switching a sport focus on and off as required, refusing to be swayed by short-term goals (e.g., finances) that will jeopardize the

achievement of long-term goals, and remaining focused on processes and not solely outcomes. More recently, researchers have found that having an appropriate attentional focus, and focusing on task relevant cues are fundamental mental qualities that help young elite athletes adapt to setbacks and effectively negotiate key transitions encountered along the pathway to excellence (Holland, Woodcock, Cumming, & Duda, 2010; MacNamara & Collins, 2010).

The second source of evidence that demonstrates the importance of focus and concentration has emerged from experimental research. For example, using quantitative methods, Mallett and Hanrahan (1997) found that sprinters who had been trained to use race plans, that deliberately involved focusing on the task at hand, ran faster than those in baseline (control) conditions. Indeed, the authors contended that the improvements observed were due to the employment of a specific cognitive strategy that focused attention on task-relevant information associated with sprint performance. Similarly, research has shown that the use of associative concentration techniques, in which athletes are trained to concentrate on bodily signals such as heart beat and kinesthetic sensations, are effective cognitive strategies that enable faster performances in running (Masters & Ogles, 1997; Morgan, 2000) and swimming (Couture, Jerome, & Tihanyi, 1999). The preceding lines of evidence, therefore, converge on the conclusion that the ability to focus and concentrate appropriately is vital for psychological resilience in sport performers since it has a positive influence on athletes' cognitive processing under pressure.

2.225 ***Perceived social support.*** In an athletic context, perceived social support refers to "one's potential access to social support and is a support recipient's subjective judgment that friends, team-mates, and coaches would provide assistance if needed" (Freeman, Coffee, & Rees, 2011, p. 54). Fletcher and Sarkar (2012) found that Olympic champions were protected from the pressures of elite sport by perceiving that high quality social support was available to them, including support from family, coaches, team-mates, and support staff. Results indicated that the perception of available support from a variety of social agents underpinned the resilience-stress-performance relationship in the world's best athletes. This finding shows the stress-buffering effects of perceived social support and suggests that it is an important aspect of resilience in elite sport.

In order to gain a better understanding of the social support experiences of sport performers, Rees and Hardy (2000) conducted interviews with high-level athletes regarding their experiences of social support. The results highlighted the multidimensional nature of social support, revealing four primary dimensions: emotional, esteem, informational, and

tangible. Emotional support refers to others being there for comfort and security, leading to a person feeling loved and cared for. Esteem support refers to others bolstering a person's sense of competence or self-esteem. Informational support refers to others providing advice or guidance, and tangible support refers to others providing concrete instrumental assistance. In line with these definitions, Freeman et al. (2011) recently developed and validated the Perceived Available Support in Sport Questionnaire (PASS-Q) using confirmatory factor analysis. Specifically, by deriving items from statements made by the high-level athletes in Rees and Hardy's study, they found evidence for a four dimension factor structure in two independent samples of athletes. Regarding the structural and predictive validity of the questionnaire, the findings demonstrated that higher levels of perceived emotional, esteem, informational, and tangible support were associated with higher levels of self-confidence and lower levels of burnout.

The four primary dimensions of support have been used to frame research on the stress-buffering effects of social support (see, e.g., Freeman & Rees, 2009; Freeman & Rees, 2010). The stress-buffering hypothesis suggests that high levels of perceived support protect an individual from the potential negative effect of stressors. Specifically, perceived support is hypothesized to intervene when a stressor is encountered, leading it to be appraised as less stressful (Cohen & Wills, 1985). In a sample of university athletes, Freeman and Rees (2010) examined the stress-buffering effects of social support on self-confidence using moderated hierarchical regression analyses. The findings showed that high perceived emotional, esteem and informational support from team-mates buffered the potential detrimental effect of performance-related stressors on self-confidence. Specifically, at low and moderate levels of support, stressors negatively affected self-confidence. However, at high levels of support, stressors did not significantly predict self-confidence. To better understand the potential mechanisms through which perceived support influences performance, Freeman and Rees (2009) examined the relationship between perceptions of support availability and objective performance in a competitive sport environment using observed variable path analysis. Findings revealed that the beneficial effects of perceived support were primarily attributable to esteem support. Perhaps more importantly in the context of psychological resilience, individuals with high levels of available esteem support appraised competitive situations as more of a challenge and less as a threat. In turn, challenge appraisals were associated with better performance. Collectively, the research in this area suggests that different types of perceived support are relevant to sport performers and that the notion of stress buffering may help to better elucidate the shielding effect of perceived available support.

In summary, this section has reviewed the five main psychological factors (viz. positive personality, motivation, confidence, focus, perceived social support) that protect athletes from the potential negative effect of stressors. By exploiting the empirical knowledge base in these areas, it is anticipated that researchers will gain a deeper profundity of the numerous protective factors that sport performers utilize and optimize to withstand the stressors they encounter. From an applied perspective, individuals operating in competitive sport should identify and monitor the psychological characteristics outlined in this review that athletes need to develop to exhibit resilience. Practitioners, for example, should help aspiring sport performers' to be proactive in their sporting development, be sensitive to different types of motivation, build confidence from multiple sources rather than focusing on one particular source, focus on what they can control and on processes, and take specific steps to obtain the support that they need.

2.23 Future research directions. There are a number of directions that future researchers can explore to advance knowledge of psychological resilience in sport performers. Regarding the stressors that athletes encounter, although researchers have extensive information about the different types of environmental demands, there is a limited understanding about the interface between and interactive impact of stressors. It would be beneficial, for example, to investigate the relationship between competitive, organizational and personal stressors and examine their combined effect on athletes' reactions and responses (cf. Brough & O'Driscoll, 2005). In the context of psychological resilience, it is important to consider the suitability of appropriately exposing athletes to stressors and encouraging them to actively engage with challenging situations that present opportunities to raise their performance level. Indeed, in Fletcher and Sarkar's (2012) study, exposure to stressors was an essential feature of the stress-resilience-performance relationship with some highly demanding adversities deemed to be crucial in the psychological and performance development of Olympic champions (see also Sarkar, Fletcher, & Brown, in press). As suggested in this observation, it will also be interesting to explore the extent to which significant adversities are instrumental in the resilience-high achievement relationship (cf. Sarkar & Fletcher, 2014a). However, before addressing these questions, a more fundamental avenue for research is better understanding when a stressor (i.e., an environmental demand) becomes an adversity (i.e, a typically negative event) for sport performers. In the extant sport psychology literature, stressors are often assumed to be adversities for athletes, including performance slumps, coach conflicts, and career transitions (see, e.g., Galli & Vealey, 2008; Tamminen et al., 2013). However, based on the definition of an adversity, a stressor only

represents an adversity if the problems displayed by an individual are typical of those exhibited in normative populations (Luthar et al., 2000). Exposure to parental divorce, for example, constitutes an adversity since children experiencing it are two or three times more likely to exhibit psychological and behavioral problems than those from non-divorced families (Hetherington & Elmore, 2003). This type of epidemiological evidence is required in relation to the stressors encountered by sport performers to ascertain whether they do indeed represent actual adversities.

Turning to the protective factors that help athletes withstand stressors, although there is a relatively large knowledge base on the main protective factors (i.e., positive personality, motivation, confidence, focus, perceived social support), there is a dearth of information about whether a matching effect exists between protective factors and stressors; that is whether particular protective factors match best with certain stressors. Furthermore, building on Fletcher and Sarkar's (2012) assertion that practitioners should intervene to achieve the best levels of, and balance between, these qualities, research is needed to determine the optimal combination of protective factors for different sport types and skill levels. This type of research, where the relative importance of each factor is determined and compared, will be best realized once a sport-specific measure of resilience is developed. In terms of better understanding this area, it is worth noting that researchers have distinguished between protective and promotive factors (see, e.g., Sameroff et al., 2003). Specifically, they have argued that, while the former implies shielding or insulation from the potential negative effects of an event, there are psychological-related phenomena that impute an independent salutary value by yielding benefits such as frequent success experiences. Sport psychology researchers need to examine the aforementioned factors at a more fine-grained level to determine if they moderate associations between stressors and adaptive outcomes (i.e., protective) or if they have a direct association with adaptive outcomes (i.e., promotive) (cf. Laird, Marks, & Marrero, 2011).

Regarding the grounded theory of psychological resilience, it is open to extension and can be tested and modified to accommodate new insights (Fletcher & Sarkar, 2012). For example, although the theory focuses on the relationship between psychological resilience and optimal sport performance, future research needs to elucidate other important outcomes of the resilience process (e.g., well-being). In terms of the design of the model, Fletcher and Sarkar (2012) acknowledged that a potential limitation concerns the validity of the linear stage framework evident within its structure. Recent evidence from cognitive neuroscience indicates that sequential, unitary approaches are rather simplistic and that parallel, multiple

processes offer a more ecologically valid conceptualization of psychological resilience (see, e.g., Feder, Nestler, & Charney, 2009). Another important consideration is the sociocultural context in which an individual operates. The model was predominantly focused on *psychological* processes underpinning the resilience-performance relationship and future resilience researchers need to explore the sociocultural context within which this occurs (cf. Ungar, 2008). It is acknowledged that the model of sport resilience is relatively new and, hence, is currently untested. To determine the utility of the model, future studies should use it to generate research questions and hypotheses about resilience in sport. For example, what psychological factors lead to positive outcomes either directly or indirectly via their influence on challenge appraisal and meta-cognitions? Since the model was derived from data collected from a specific group of participants, such questions might be best answered through large scale quantitative studies, using statistical techniques such as structural equation modeling, to predict resilience across a wider range of athletes and sport settings.

Part two of this chapter has provided a platform for developing a sport-specific measure of psychological resilience (cf. this volume, chapter two, part one). Due to the conceptually distinct nature of stressors and protective factors, researchers will need to assess these concepts and validate their associated scales separately from the outset. In terms of measuring the stressors that athletes' encounter, when generating a pool of questionnaire items, researchers need to consider the variety of demands associated with competitive performance, the sport organization within which the athletes operate, and personal "nonsporting" life events. To gain a more comprehensive picture of stressors, sport psychology researchers should consider the inclusion of both significant life events and ongoing daily pressures in an initial pool of items. In terms of measuring the factors that protect athletes from negative consequences, researchers will need to assess the protective factors relating to a positive personality, motivation, confidence, focus, and perceived social support. More specifically, when generating a pool of items, questions should focus on aspects of athletes' desirable cognitive tendencies, autonomous values and beliefs, general and robust sport confidence, ability to focus appropriately, and perceptions of available social support.

2.24 Concluding remarks. Psychological resilience is important in sport since athletes must utilize and optimize a constellation of protective factors to withstand the distinct stressors that they encounter (Fletcher & Sarkar, 2012). To help researchers gain a better appreciation of the existing knowledge base in key resilience-related areas, in part two of this chapter I reviewed stressors and protective factors in the specific context of athletic

performance. The stressors encountered by sport performers can be classified under the following three categories and fourteen subcategories: competitive performance (preparation, injuries, pressure, underperforming, expectations, self-presentation, and rivalry), the sport organization within which the athletes operate (leadership and personal issues, cultural and team issues, logistical and environmental issues, and performance and personal issues), and personal "nonsporting" life events (work-life interface, family issues, and the death of a significant other). In part two of this chapter I also synthesized the extant literature pertaining to the five main psychological factors (viz. positive personality, motivation, confidence, focus, perceived social support) that protect athletes from the potential negative effect of stressors. It is hoped that this review will provide a rigorous and robust foundation for the development of a sport-specific measure of resilience, and subsequently help researchers examine the interplay between stressors and protective factors, which will, in turn, focus the analytical lens on the processes underlying psychological resilience in athletes.

2.3 Rationale, Purpose, and Structure of the Thesis

To significantly advance psychologists' knowledge and understanding of this area, there exists an urgent need to develop a sport-specific measure of resilience (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). The purpose of this thesis, therefore, is to investigate the assessment of psychological resilience in sport performers. Chapter two has provided a rigorous and robust foundation for the development of a sport-specific measure of resilience. Drawing on the reviews of resilience in sport in Chapter two, Chapter three (studies one-three) describes the development and validation of the Sport Resilience Scale (SRS). Using the SRS, and based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience, Chapter four (studies 4 and 5) investigates resilience in sport performers via an examination of moderation and mediation hypotheses. Lastly, Chapter five offers a summary, discussion, and conclusion of the thesis.

Chapter Three: Empirical Research: Studies One-Three

In the previous chapter, I explored psychometric issues in resilience research and the implications for sport psychologists seeking to measure this phenomenon in an athletic context (part one) and discussed psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands (part two). Drawing on the knowledge of resilience, gleaned from chapters one and two, the aim of chapter three is to describe the development and validation of the Sport Resilience Scale (SRS). Chapter three reports a series of three related studies. The purpose of Study 1 is to provide content validity of a pool of items designed to reflect psychological resilience in athletes. The aim of Study 2 is to examine the factorial structure of the SRS using exploratory factor analysis. The purpose of Study 3 is to test the factorial structure of the SRS via confirmatory factor analysis, to investigate whether the components of the measurement model are invariant across different groups, and to examine the relationship between the SRS and other relevant concepts.

Development and Validation of the Sport Resilience Scale (SRS)

3.1 Introduction

Psychological resilience is important in the sport context because athletes must constantly withstand a wide range of pressures to attain and sustain performance and well-being (cf. Gould & Maynard, 2009; Hardy, Jones, & Gould, 1996; Krane & Williams, 2006). The majority of studies that have specifically examined resilience in sport (see, e.g., Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011) have highlighted the need for a measure of resilience in athletic performers to advance sport psychologists' understanding of this area. The purpose of the current chapter was, therefore, to develop a sport-specific measure of resilience and provide evidence of its validity.

Psychological resilience has recently been defined as "the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors" (Fletcher & Sarkar, 2012, p. 675; 2013, p. 16). Regarding the assessment of this desirable construct, over a dozen measures of resilience have been developed and validated by various researchers during the past three decades (see, for a review, Windle et al., 2011). Although Windle et al. (2011) "found no 'gold standard' amongst 15 measures of resilience" (p. 8), one measure that has received considerable research attention – more so than other scales – is the Connor-Davidson Resilience Scale (CD-RISC; Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). In the first and only study to apply this measure in a sport context, Gucciardi et al. (2011) examined the factor structure of the CD-RISC in a sample of Australian athletes. Although partial structural integrity of the revised 10-item scale was found across samples of adolescent and adult cricketers, the authors argued that the "CD-RISC-10 (and its original version) diverts the user's attention from examining the true nature of resilience (i.e., positive adaptation in the face of adversity)" (p. 430). In addition, they go on to mention that "important protective (e.g., teammate support) and vulnerability (e.g., rigorous training schedules) factors are likely not to be adequately captured when using measures such as the CD-RISC that were developed with other populations in mind" (p. 431). Other limitations of the scale include its focus on individual resilient qualities, the limited evidence base for the selection of items, and its conceptual overlap with coping (Sarkar & Fletcher, 2014b; this volume, chapter two, part one).

Drawing on the broader psychometric literature in this area, in part one of chapter two, I reviewed measurement issues in resilience research and discussed the implications for sport psychology. I concluded that resilience itself cannot be directly measured but can be inferred based on the direct assessment of three independent components: stressors (or adversity)[1], protective factors, and positive adaptation. Based on this tripartite conceptualization of psychological resilience, and in a conceptually analogous fashion to the tripartite structure of efficacy beliefs (cf. Jackson, Knapp, & Beauchamp, 2008; Jackson, Whipp, Chua, Pengelley, & Beauchamp, 2012), resilience is considered to be an overarching construct comprising of the three aforementioned distinct concepts. Thus, to realize a complete and accurate representation of psychological resilience, researchers need to

[1] To allow different types of situations, circumstances, and experiences to be included under the rubric of resilience, the more neutral term "stressor" is employed here rather than the negative value-laden term "adversity" (cf. this volume, chapter two, parts one & two).

separately assess and analyze stressors, protective factors, and positive adaptation from the outset (this volume, chapter two, part one).

3.11 Stressors. Stressors are defined as "the environmental demands (i.e., stimuli) encountered by an individual" (Fletcher et al., 2006, p. 359) and are an essential feature of resilience for athletic performers (Fletcher & Sarkar, 2012; Sarkar, Fletcher, & Brown, in press). In one of the first sport-related resilience studies, Galli and Vealey (2008) identified four different stressors (viz. injury, performance slump, illness, career transition) experienced by college and professional athletes. It is worth noting that exposure to these demands mobilized personal resources for subsequent stressors (cf. Neff & Broady, 2011; Seery, 2011). Most recently, Fletcher and Sarkar (2012) interviewed twelve Olympic champions to explore and explain the relationship between psychological resilience and optimal sport performance. They found that the world's best athletes encountered a wide variety of different stressors, ranging from ongoing daily demands (e.g., balancing work and training) to major life events (e.g., the death of a close family member). Importantly, in the context of the present discussion, exposure to stressors was a vital feature of the resilience-performance relationship with some significant adversities deemed to be crucial in the psychological and performance development of Olympic champions (see also Sarkar et al., in press).

To help researchers gain a deeper profundity of resilience in sport, in part two of chapter two, I reviewed the different types of stressors encountered by sport performers. The demands were classified under three main categories: competitive performance (preparation, injuries, pressure, underperforming, expectations, self-presentation, and rivalry), the sport organization within which the athletes operate (leadership and personal issues, cultural and team issues, logistical and environmental issues, and performance and personal issues), and personal life events (work-life interface, family issues, and the death of a significant other). The stressors identified in this review provided the foundation for the first component of my sport-specific measure of resilience.

3.12 Protective factors. Protective factors are defined as "influences that modify, ameliorate, or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome" (Rutter, 1985, p. 600). Galli and Vealey (2008) found that a number of personal resources and socio-cultural factors positively influenced athletes' efforts to withstand stressors. Resilient qualities included positivity, determination, competitiveness, commitment, maturity, persistence, passion for the sport, and strong networks of social support. In the most recent study in this area, Fletcher and Sarkar (2012) found that Olympic champions possessed several psychological-related phenomena that underpinned the

resilience-stress-performance relationship. These factors related to a positive personality, motivation, confidence, focus, and perceived social support.

To gain a more comprehensive understanding of protective factors in the specific context of sport performance, in part two of chapter two, I synthesized the research investigating the five main families of psychological factors that the world's best athletes utilize and optimize to withstand the stressors they encounter (Fletcher & Sarkar, 2012). Personality traits that were identified in the review were adaptive perfectionism, optimism, competiveness, dispositional hope, and proactivity. In terms of motivation, the process of internalization and integration appeared to be an important psychological asset. Specifically, elite sport performers find ways to evaluate and bring into congruence the demands of the sport with their personally held values and beliefs (cf. Mallett & Hanrahan, 2004). Various sources of confidence, salient to world class athletes, were identified in the review including preparation, performance accomplishments, coaching, innate factors, social support, experience, competitive advantage, self-awareness, and trust (see, e.g., Hays et al., 2007). Perhaps more importantly in the context of psychological resilience, robust confidence (i.e., the ability to maintain belief in the face of disconfirming experiences) was identified as a psychological characteristic that acts as a buffer against stressors (cf. Thomas et al., 2011). In terms of focus, the review concluded that the ability to focus and concentrate is vital for psychological resilience in sport performers since it has a positive influence on athletes' cognitive processing under pressure. Lastly, four dimensions of perceived social support (viz. emotional, esteem, informational, tangible) were identified in the literature (see Rees & Hardy, 2000) that protect athletes from the potential negative effect of stressors (see, e.g., Freeman & Rees, 2009). The protective factors synthesized in this review provided the basis for the second component of my sport-specific measure of resilience.

3.13 Positive adaptation. Positive adaptation has been defined as "[adaptation] that . . . is substantially better than what would be expected given exposure to the risk circumstance being studied" (Luthar & Zelazo, 2003, p. 515). In a competitive sport setting, a contextually relevant operationalization of positive adaptation would be indicators of competence and well-being (this volume, chapter two, part one). Galli and Vealey (2008) identified numerous positive outcomes in their study of resilience relating mainly to athletes' well-being, including learning valuable lessons from experiences with stressors and gaining a new outlook or perspective on sport and/or life. Fletcher and Sarkar (2012) explored and explained the resilience-performance relationship since "everything is a performance issue" (McCann, 2008, p. 268) for athletes competing at Olympic level. Interestingly, the world's

best athletes described optimal sport performance as fulfilling their athletic potential rather than becoming an Olympic champion. Thus, the authors asserted that "whilst becoming more resilient appears to lead to better performance, it would be an oversimplification to suggest that in winning an Olympic gold an athlete had reached a point of being resilient" (p. 675). When further examining the grounded theory of psychological resilience in a different sample of elite sport performers, Moyes, Sarkar, Brown, Coleridge-Smith, and Fletcher (2013) found that although becoming more resilient seemed to lead to better performance, the results also indicated that well-being was an important outcome of resilience.

When discussing how best to measure positive adaptation in sport performers, in part one of chapter two, I asserted that indices used to assess positive adaptation should be specific to the particular risk under scrutiny in terms of the domains assessed and stringency of criteria used. I further argued that this component of resilience should be assessed across multiple "theoretically similar" (Luthar et al., 2000, p.548) domains since an overly narrow conceptualization of positive adaptation can convey a misleading picture of success in the face of adversity. Among competitive athletes, I proposed that subjective performance and well-being are likely to be of particular relevance. It is worth noting that current performance measures utilized in sport psychology have typically been limited to one or two items that solely assess a participant's rating of his or her general performance level (see, e.g., Dewar & Kavussanu, 2011; Nicholls et al., 2010; Reeves, Nicholls, & McKenna, 2011). More comprehensive measures of subjective performance are needed that assess an individual's perception of mastery, achievement, improvement, and goal attainment. Furthermore, the majority of studies examining athletes' wellbeing do not provide a conceptual rationale for its measurement (Lundqvist, 2011). More specifically, Lundqvist (2011) asserted that "sport psychology research on well-being among competitive athletes suffers from ambiguous and inconsistent definitions of well-being as many studies do not provide a definition, or use diverse well-being labels seemingly interchangeably" (p. 123). Thus, taking these limitations into account, I considered indicators of performance and well-being (i.e., positive adaptation) more thoroughly in the third component of my sport-specific measure of resilience.

Drawing on the knowledge of resilience, gleaned from qualitative studies and reviews of this area (viz. Fletcher & Sarkar, 2012; this volume, chapter two, parts one & two), the aim of chapter three was to develop and validate a measure of psychological resilience in sport performers. More specifically, a series of three studies were carried out to develop and provide initial evidence for the reliability and validity of the Sport Resilience Scale (SRS). The purpose of Study 1 was to provide content validity of a pool of items designed to reflect

psychological resilience in athletes. The aim of Study 2 was to examine the factorial structure of the three independent components of the SRS (viz. stressors, protective factors, and positive adaptation) using exploratory factor analysis. The purpose of Study 3 was to test the factorial structure of the SRS via confirmatory factor analysis, to investigate whether the components of the measurement model were invariant across different groups, and to examine the relationship between the SRS and other relevant concepts.

3.2 Study One

The aims of Study 1 were to (a) develop a pool of items reflecting the tripartite nature of psychological resilience in sport performers (b) assess the content validity of the items via independent panels of experts.

A multi-method approach was adopted to inform the development of the SRS (cf. Hagger & Chatzisarantis, 2011). Specifically, the present scale was derived from a grounded theory of psychological resilience in Olympic champions (Fletcher & Sarkar, 2012), and items were generated from narrative reviews of psychological resilience in the context of sport performance (this volume, chapter two, parts one & two). An initial pool of sport-relevant items was developed to capture the three pivotal components of resilience: stressors, protective factors, and positive adaptation. To facilitate item creation, the applicability of items – that tapped into pertinent features of resilience – were evaluated from various existing measures. These included: organizational stressors (Arnold, Fletcher, & Daniels, 2013), sport motivation (Lonsdale, Hodge, & Rose, 2008), robust sport confidence (Beattie et al., 2011), perceived social support (Freeman et al., 2011), athlete satisfaction (Riemer & Chelladurai, 1998), and feelings of competence in sport (Ng, Lonsdale, & Hodge, 2011). In line with Gelbach and Brinkworth's (2011) guidelines for item development, I strived to include more items than were needed for the final scale, ensured that every part of every question applied to every respondent, and checked that the item stems cohered with the response anchors. In addition, I avoided lengthy items, items that required a high level of reading comprehension, and double-barreled items. The result of this item generation process was a preliminary version of the SRS containing 105 items: 30 items for stressors, 50 items for protective factors, and 25 items for positive adaptation.

Content validity refers to the degree to which a set of items reflects the domain they intend to measure and is an important aspect of scale development (Haynes, Richard, & Kubany, 1995). The most effective way of examining content validity is through expert opinion (Dunn, Bouffard, & Rogers, 1999). Based on the operational definitions of the three components of resilience, independent panels of experts assessed the pool of items that were

identified as potentially relevant in the item generation phase. The details of how content validity was established are reported forthwith.

3.21 Method.

3.211 *Participants*. For participant details, see Table 3.1.

3.212 *Procedure*. Ethical approval was obtained from the principal investigator's university ethics committee for each of the studies reported in this paper, which were conducted in accordance with American Psychological Association's (2010) guidelines. Specialists from around the world were subsequently recruited, via an invitational email, to participate in the first study to help validate the SRS. A large variety of judges was specifically sought to ensure heterogeneity within the sample (cf. Dunn et al., 1999). Three expert panels were enlisted in total, with each panel containing at least five athletes, three coaches, one sport psychology PhD student, one sport psychologist, and one academic with extensive experience of psychometrics. In line with DeVellis's (2012) guidelines for scale development, experts were asked to rate the suitability of each item presented to them by marking "yes", "no", or "unsure" with respect to "relevance" (i.e., does this question reflect the definition of stressors/protective factors/positive adaptation provided?), "clarity" (i.e., is this question easily understood?), and 'specificity' (i.e., is this question focused enough and not too general?). I considered asking all the experts to assess the relevance, clarity, and specificity for each of the 105 proposed items; however, I was concerned that making 315 ratings might have been overly burdensome (cf. Lonsdale et al., 2008). Instead, the reviewers were presented with a sample of questions from each of the three parts of the scale (see Appendix 1). This approach ensured that all of the items from the various sections were assessed and scrutinized by several different members of a panel. Indeed, Dunn et al. (1999) asserted that raters with diverse backgrounds and experiences can provide different assessments of item content.

Under each item, a comments section was included to provide an opportunity for participants to suggest modifications to the questions, and to offer any further comments regarding their responses. In addition, panel members were asked a number of open-ended questions about the format, layout, and presentation of the psychometric tool. Lastly, the judges were asked to choose the most suitable name of the instrument specifically to determine which name, from the following options, best represented the questions that were posed and was the most aesthetically pleasing: Sport Resilience Scale (SRS), Resilience Scale for Sport Performers (RS-SP), and Resilience in Sport Questionnaire (RSQ). After the expert panels were completed, the feedback (quantitative and qualitative) was then reviewed.

Table 3.1 *Participant Characteristics (Studies One, Two, and Three)*

	Study 1	**Study 2**	**Study 3 – Full Sample**	**Study 3 – Sub Sample**
N	49	475	1566	918
Male	31	280	818	538
Female	18	195	748	380
M_{age} (*SD*)	29.69 (9.56)	26.50 (9.80)	28.44 (11.99)	28.98 (11.83)
Number of Nationalities	7	35	51	38
Number of Sports	17	56	73	55
Sport Type				
Team	24	203	951	640
Individual	25	272	615	278
Performance Status				
Full-time	5	65	1273	757
Part-time	44	410	293	161
Performance Level				
International	4	34	213	98
Senior national	9	39	187	95
Collegiate/University	3	152	371	178
State/Regional	3	26	81	53
Junior national	5	5	34	15
County	5	18	118	69
Club	13	190	545	403
Other	7	11	17	7
Experience (*SD*)	13.27 (8.25)	9.92 (9.32)	13.73 (10.90)	14.87 (11.62)
Expert Type				
Athlete	15	Not applicable	Not applicable	Not applicable
Coach	10	Not applicable	Not applicable	Not applicable
Sport Psychology PhD student	10	Not applicable	Not applicable	Not applicable
Sport Psychologist	7	Not applicable	Not applicable	Not applicable
Psychometrician	6	Not applicable	Not applicable	Not applicable
Sport Operations Manager	1	Not applicable	Not applicable	Not applicable

Note. All reported values represent the number of participants, with the exception of the values for mean age and experience, which are reported in years.

3.22 Results and discussion. An item was retained if it was viewed as relevant, specific, and clear by at least 75% of the panel members (cf. Eys, Loughead, Bray & Carron, 2009; Jowett & Ntoumanis, 2004; Rhind & Jowett, 2010). Based on this quantitative criterion, 85 items were retained and 20 items were modified. As an illustration of item evaluation, three items were considered to be somewhat unrelated to the domain they intended to measure. This was thought to be due to the reverse-scored nature of the items. In theory, negatively worded items are useful to prevent respondents from answering all the questions in the same way; in practice, however, reversals in item polarity may be confusing for participants, especially when completing a long questionnaire, and may also diminish scale reliability (DeVellis, 2012; Gelbach & Brinkworth, 2011). Thus, to enhance item relevance, all negatively phrased items (e.g., 'I disliked competing against others') were modified to be positively worded (e.g., 'I enjoyed competing against others'). Regarding feedback for the name of the psychometric instrument, the SRS was judged to be the most appropriate for the questions that were posed (38.8%) and perhaps more evidently, the most aesthetically pleasing (69.4%).

To supplement the quantitative ratings, qualitative comments provided valuable information regarding the content validity of the items and enhanced my ability to revise the scale. For example, the item 'I was able to identify opportunities' was considered to lack clarity and specificity according to the aforementioned quantitative criterion, and the qualitative feedback confirmed these viewpoints with participants suggesting that the item was "a little vague" and that "perhaps [I could] expand this [item] to include the sort of opportunities [I had] in mind". The item was subsequently changed, as a result of these comments, to 'I have identified opportunities in the environment to improve my performance in sport'. Overall, the independent panels of experts helped to establish the content validity of the SRS. This assertion is nicely captured in the following quote by an expert panel member who, at the time of the study, was researching resilience in elite sport:

> An attractive sounding scale and clearly adds something different to existing inventories and helps to make resilience distinct from other overlapping areas. Also, effective in capturing both sport and life aspects which could be critical than merely sport performance (hence why I didn't think the title 'Resilience Scale for Sport Performers' was as effective [as 'Sport Resilience Scale']. The life aspects could be very important bearing in mind recent events such as the death of Gary Speed [an ex-soccer player from the United Kingdom who committed suicide].

3.3 Study Two

The aim of Study 2 was to examine the factor structure of the 105 item SRS, generated and validated in Study 1, using exploratory factor analysis (EFA). EFA was undertaken at this early stage of scale development to avoid misspecification of the number of factors and to maximize the convergent and discriminant validity of the items constituting each factor (Gerbing & Hamilton, 1996). In line with the tripartite conceptualization of psychological resilience (this volume, chapter two, part one), resilience was considered to be an overarching construct comprising of three distinct concepts.

3.31 Method.

3.311 *Participants*. For participant details, see Table 3.1.

3.312 *Measure* (see Appendix 2)**.** The SRS contained 105 items and was divided into three separate parts: stressors, protective factors, and positive adaptation. Within each section, items were randomly ordered to reduce the potential for response bias.

3.3121 *Stressors.* In part one, 30 items were generated that were purported to represent a range of stressors encountered by sport performers (see, for a review, this volume, chapter two, part two). Participants were asked about pressures they may have experienced in the past month. They rated each item responding to the stem "in the past month, I have experienced pressure associated with . . ." with each item being assigned a 5-point Likert scale ranging from 1 = *never* to 5 = *always*.

3.3122 *Protective factors.* In part two, 50 items were generated that were purported to represent a range of sport-specific protective factors (see, for a review, this volume, chapter two, part two). Participants were asked about personal qualities and thoughts they may have displayed when experiencing pressures (identified in part one). They rated each item responding to the stem "in the past month . . ." with each item being assigned a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*.

3.3123 *Positive adaptation.* In part three, 25 items were generated that were purported to represent multiple indicators of positive adaptation in athletes (cf. this volume, chapter two, part one). Participants were asked to consider how they felt about sport and life in relation to the pressures they had experienced (identified in part one). The item stem and 5-point scale was the same as part two.

3.313 *Procedure*. A heterogeneous sample of athletes who had participated in competitive sport over the past month at club level or higher was recruited. A variety of sport personnel were contacted directly, via email, to explain the purpose and nature of the study. Following an introduction to the study, athletes who met the aforementioned criteria for

completion were invited to participate in the study. Athletes were directed to an online questionnaire via a URL embedded in the email. Bristol Online Surveys (www.survey.bris.ac.uk) was used to collect the data. This online survey platform encrypts survey responses using secure socket layers to protect the transmission of participant responses to the online database. As an additional measure to maintain participant confidentiality and anonymity, Bristol Online Surveys do not collect the Internet protocol addresses of respondents. It is worth noting that collecting data online typically provides a better response rate and contains fewer missing responses than paper methods (cf. Lonsdale, Hodge, & Rose, 2006). Various pieces of information were presented to participants on the first page of the website: an introduction to the study, an estimated time of completion, an encouragement to share experiences in an open and honest manner, and reassurances that responses would be confidential and anonymous. These confidential assurances were deemed to be essential since they have been shown to improve the response rate for sensitive data (Ransdell, 1996). Once participants understood the purpose and nature of the study and consented to complete it, they were presented with a series of web pages containing demographic information and the questionnaire items.

3.32 Results and discussion.

3.321 ***Exploratory factor analysis*****.** Three EFA's were conducted on the three separate parts of the SRS to identify the underlying dimensions of stressors (30 items), protective factors (50 items), and positive adaptation (25 items). Indeed, when suggesting best practice for developing a resilience scale for sport performers, in part one of chapter two, I argued that due to the conceptually distinct nature of stressors, protective factors, and positive adaptation, researchers need to separately assess and analyze these concepts from the outset to attain a comprehensive and true representation of resilience.

For each part of the scale, principal axis factor analyses were carried out with a direct oblimin rotation. Principal-axis factoring was chosen because, unlike principal components analysis, it distinguishes between common and error variance in the items, and is appropriate when the research is driven by conceptual and theoretical predictions (Tabachnick & Fidell, 2007). An oblique rotation was used since it was hypothesized that the factors within each part of the scale would be interrelated. Although the sample size exceeded 300, the average communalities of the items was < .60, highlighting the need to use multiple criteria for factor extraction (Field, 2009). An inspection of eigenvalues of > 1.0 was made and particular attention was paid to the scree plot since solely adopting the criteria for eigenvalues may lead to the retention of factors with no practical significance (Stevens, 2002). The cleanest factor

structure was assessed using the following criteria: (a) item loadings above .30 (no items with primary factor loadings < .30), (b) no high cross-loadings (i.e., secondary loadings > .30), and (c) no factor with less than 3 items. Following a sequence of factor analyses and employing the aforementioned criteria, the factor solution for each part of the scale was generated and is reported forthwith.

3.3211 *Stressors.* The final EFA solution contained 14 items that loaded onto 3 factors and accounted for 57.18% of the item variance (see Table 3.2 for item means, standard deviations, factor loadings, factor correlations, and internal consistency estimates). The 3 factors were labeled *Performance and Self Presentation Issues, Coach and Team Issues,* and *Personal Commitments and Circumstances.* It is worth noting that five items relating to major life events (viz. 'the death of someone close to me', 'a serious illness', 'moving house to a different town or city', 'prejudice and discrimination from others', and 'a relationship breakdown') were removed initially since the item-level descriptive statistics indicated some departure from the levels of normality assumptions.

3.3212 *Protective factors.* The final EFA solution contained 20 items that loaded onto 4 factors and accounted for 55.95% of the item variance (see Table 3.3 for item means, standard deviations, factor loadings, factor correlations, and internal consistency estimates). The four factors were labeled *Perceived Social Support, Robust Confidence and Focus, Proactive Personality*, and *Autonomous Values and Beliefs*.

3.3213 *Positive adaptation.* The final EFA solution contained 12 items that loaded onto 2 factors and accounted for 61.05% of the item variance (see Table 3.4 for item means, standard deviations, factor loadings, factor correlations, and internal consistency estimates). The two factors were labeled *Perceived Sport Competence* and *Hedonic Well-being*.

3.3214 *Overall EFA.* An overall EFA was conducted on the 46 retained items to confirm they represented the overarching construct of psychological resilience. The solution loaded onto 9 factors, mirroring the factors from the separate EFA's, and accounted for 59.80% of the item variance.

3.322 ***Item analysis*.** Once the underlying dimensions of stressors, protective factors, and positive adaptation were determined, an item analysis was carried out to assess the homogeneity of the items representing each factor (DeVellis, 2012). To assess the internal reliability of each factor, the following criteria were employed: (a) an inter item correlation between $r = .20$ and $r = .70$, (b) a minimum corrected item-total correlation coefficient of $r = .30$, and (c) an increase in the alpha estimate if an item was deleted (Kidder & Judd, 1986; Nunnally & Bernstein, 1994). All of the items were retained since they met at least two out of

Table 3.2 *Stressors: Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following EFA (Study Two)*

Stressors Subscale and Item	**M**	**SD**	**F1**	**F2**	**F3**	**Skewness**	**Kurtosis**
Performance and Self Presentation Issues							
Others' expectations of my performance	2.54	1.16	*0.85*	0.02	0.09	0.32	-0.87
My performance being evaluated by others in my team	2.44	1.16	*0.75*	0.12	0.06	0.44	-0.74
Not wanting to let others down	2.76	1.23	*0.67*	0.07	0.00	0.30	-0.83
A dip in my usual levels of performance	2.41	1.02	*0.64*	0.09	0.09	0.61	-0.25
My mental preparation for competition	2.29	1.10	*0.63*	0.05	0.02	0.65	-0.35
Making mistakes during competition	2.13	0.93	*0.57*	0.04	0.03	0.81	0.62
Coach and Team Issues							
The relationship with my coach	1.80	1.00	0.02	*0.81*	0.00	1.33	1.17
My coach's behaviour	1.65	0.95	0.02	*0.79*	0.03	1.54	1.87
The communication within my team	1.95	0.99	0.30	*0.36*	0.20	1.02	0.59
The relationships within my team	1.93	1.06	0.22	*0.31*	0.27	1.17	0.76
Personal Commitments and Circumstances							
My relationship with significant others	1.84	1.00	0.06	0.10	*0.61*	1.19	0.80
My family responsibilities	1.88	1.14	0.07	0.02	*0.59*	1.19	0.46
My travel arrangements for training or competition	1.75	0.95	0.05	0.05	*0.55*	1.31	1.23
A lack of personal finances	2.09	1.24	0.15	0.12	*0.44*	0.96	-0.15

Factor Correlations and Internal Consistency	**1**	**2**	**3**
1. Performance and Self Presentation Issues	0.85		
2. Coach and Team Issues	0.42	0.79	
3. Personal Commitments and Circumstances	0.51	0.39	0.64

Note. F1 = Performance and Self Presentation Issues, F2 = Coach and Team Issues, F3 = Personal Commitments and Circumstances. Numbers in italics indicate primary loadings. Cronbach alpha's are presented on the diagonal of the factor correlation matrix.

Table 3.3 *Protective Factors: Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following EFA (Study Two)*

Protective Factors Subscale and Item	**M**	**SD**	**F1**	**F2**	**F3**	**F4**	**Skewness**	**Kurtosis**
Perceived Social Support								
Someone would have showed concern for me if I needed help	3.82	0.93	*0.78*	0.06	0.04	0.04	-0.68	0.07
Someone would have been there for me if I needed support	3.84	0.97	*0.77*	0.12	0.04	0.05	-0.67	-0.10
Someone would have increased my confidence to deal with pressure if needed	3.55	0.91	*0.76*	0.05	0.00	0.03	-0.58	0.16
Other people would have boosted my sense of competence if needed	3.65	0.84	*0.73*	0.04	0.00	0.04	-0.54	0.25
People around me would have given me appropriate support if I was performing poorly	3.59	0.87	*0.71*	0.06	0.03	0.00	-0.44	-0.14
Helpful feedback would have been given to me by others if needed	3.79	0.89	*0.63*	0.12	0.08	0.03	-0.70	0.23
People around me would have reinforced the positives in most situations	3.65	0.81	*0.62*	0.01	0.09	0.00	-0.50	0.31
Robust Confidence and Focus								
If I made a mistake my confidence was not badly affected	3.12	1.04	0.03	*0.78*	0.07	0.11	-0.05	-0.84
Negative feedback from others has not affected my levels of confidence	3.02	1.02	0.05	*0.70*	0.05	0.12	0.04	-0.78
My confidence has remained stable	3.49	1.07	0.04	*0.61*	0.19	0.25	-0.57	-0.46
I remained focused on processes and not solely on outcomes	3.48	0.90	0.12	*0.43*	0.18	0.10	-0.37	-0.35
I focused my time and energy on behaviours that were relevant to my objectives	3.73	0.76	0.10	*0.40*	0.25	0.06	-0.31	-0.12
I had the ability to maintain my concentration over long periods of time	3.71	0.90	0.16	*0.33*	0.10	0.12	-0.54	-0.10
Proactive Personality								
I have constantly been looking for better ways to do things in training or competition	4.02	0.80	0.07	0.02	*0.72*	0.05	-0.62	0.11
I have actively chosen to engage with challenging situations	3.93	0.79	0.03	0.06	*0.63*	0.17	-0.52	0.01
I have identified opportunities in the environment to improve my performance in sport	3.75	0.83	0.13	0.00	*0.46*	0.09	-0.60	0.31
Autonomous Values and Beliefs								
I enjoyed competing against others	4.20	0.81	0.01	0.02	0.01	*0.67*	-1.00	0.11
My sport provided me with an opportunity to be myself	4.20	0.81	0.12	0.07	0.17	*0.53*	-0.93	0.84
Participation in my sport allowed me to live in a way that was true to my values	3.96	0.79	0.05	0.12	0.02	*0.50*	-0.40	0.11
I have valued the benefits of my sport	4.41	0.65	0.10	0.05	0.13	*0.46*	-0.93	0.96

Factor Correlations and Internal Consistency	**1**	**2**	**3**	**4**
1. Perceived Social Support	0.88			
2. Robust Confidence and Focus	0.32	0.77		
3. Proactive Personality	0.34	0.27	0.71	
4. Autonomous Values and Beliefs	0.38	0.36	0.48	0.68

Note. F1 = Perceived Social Support, F2 = Robust Confidence and Focus, F3 = Proactive Personality, F4 = Autonomous Values and Beliefs. Numbers in italics indicate primary loadings. Cronbach alpha's are presented on the diagonal of the factor correlation matrix.

Table 3.4 *Positive Adaptation: Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following EFA (Study Two)*

Positive Adaptation Subscale and Item	**M**	**SD**	**F1**	**F2**	**Skewness**	**Kurtosis**
Perceived Sport Competence						
I felt I have been good at my sport	3.84	0.82	*0.86*	0.12	-0.80	0.85
I have felt successful at my sport	3.73	0.89	*0.84*	0.03	-0.65	0.22
I have been satisfied with my individual performance in my sport	3.73	0.88	*0.81*	0.04	-0.70	0.38
I have had the ability to perform well in my sport	3.97	0.81	*0.74*	0.02	-0.95	1.48
I have been satisfied with the improvement of my skill level	3.54	0.93	*0.66*	0.05	-0.53	0.11
I have been satisfied with the degree to which I have reached my performance goals	3.47	1.04	*0.64*	0.04	-0.46	-0.56
I have mastered challenging skills in my sport	3.71	0.91	*0.56*	0.17	-0.42	-0.34
Hedonic Well-being						
I had a sense of direction and purpose in life	3.98	0.87	0.09	*0.80*	-0.88	0.82
I achieved important things in my life	3.94	0.90	0.01	*0.80*	-0.79	0.41
I have been satisfied with my life	3.95	0.91	0.01	*0.74*	-0.97	1.11
I have been happy with my life	3.99	0.88	0.10	*0.66*	-0.91	0.90
I have learnt valuable lessons about life which have made me a stronger person	3.96	0.93	0.06	*0.47*	-0.77	0.23

Factor Correlations and Internal Consistency	**1**	**2**
1. Perceived Sport Competence	0.89	
2. Hedonic Well-being	0.61	0.83

Note. F1 = Perceived Sport Competence, F2 = Hedonic Well-being. Numbers in italics indicate primary loadings. Cronbach alpha's are presented on the diagonal of the factor correlation matrix.

the three conditions (cf. Jowett & Ntoumanis, 2004). Following this analysis, Cronbach alpha coefficients were calculated to assess the internal consistency of the factors. In the present study, internal consistency estimates for the scales ranged from .64 to .89 (M = .78).

Three items in the overall EFA did not meet the aforementioned criteria for factor extraction. Specifically, the items 'the communication within my team', "participation in my sport allowed me to live in a way that was true to my values", and "I have learnt valuable lessons about life which have made me a stronger person" had borderline cross loadings of .32, .33, and .35 respectively. Despite the marginal cross loadings for the three respective cases, the items contributed to good reliability estimates for their respective factors. Moreover, the items appeared to represent salient elements of resilience and were considered to be relevant by the expert panels in Study 1. Thus, I believed it would be premature to delete these items at such an early stage of psychometric testing.

3.4 Study Three

The first objective of Study 3 was to cross-validate the findings of Study 2 using CFA and, if necessary, further refine the structure of the SRS. CFA is a particularly pertinent data analytical technique when there is a strong theoretical base for the hypothesized measurement model (Russell, 2002; Williams, 1995). Indeed, in the sport and exercise psychology literature, Hagger and Chatzisaratis (2009) observed that "in the last 25 years, confirmatory factor analytic techniques have become the preferred state-of-the-art method to evaluate . . . the adequacy of a proposed factor structure" (p. 913; see also Marsh, 2012). Second, this study examined whether components of the measurement model were invariant across different groups. Third, Study 3 examined the concurrent validity of the SRS by observing the relationships between the resilience-related factors and other relevant concepts.

3.41 Method.

3.411 ***Participants*****.** For participant details, see Table 3.1.

3.412 ***Measures*** (see Appendix 3)**.**

3.4121 *Sport Resilience Scale (SRS).* The 46-item SRS, as described in Study 2, was distributed to participants.

3.4122 *Perceived Stress Scale (PSS).* Sport performers' perceived stress was measured using the 10-item PSS (Cohen & Williamson, 1988). The PSS is intended to measure the degree to which situations in one's life are considered stressful (i.e., stressors), comprising events that may cause strain. On a 5-point Likert-type scale that ranged from 0 (*never)* to 4 (*very often),* participants were required to indicate how they felt or thought over the past month (e.g., "in the last month, how often have you been upset because of something

that happened unexpectedly?", "in the last month how often have you felt nervous or stressed?", "in the last month how often have you felt difficulties were piling up so high that you could not overcome them?"). The 10-item version of the PSS is a revised version of the original 14-item scale, and it is considered by its developers to be psychometrically reliable and comparable with its predecessor (Cohen & Williamson, 1988). In the current study, the scale was internally consistent ($\alpha = .86$).

3.4123 *Connor-Davidson Resilience Scale (CD-RISC).* Sport performers' resilient qualities were measured using the 10-item CD-RISC (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003). The focus of the CD-RISC is on personal resources or qualities deemed appropriate for positive adaptation to adversity. In developing the CD-RISC, Connor and Davidson (2003) created items that were designed to tap into features or characteristics of resilience commonly reported in the available literature. These features included but were not limited to: control, commitment, challenge, adaptability, problem solving, and strengthening effects of stress. For each item (e.g., "I am able to adapt when changes occur", "under pressure, I stay focused and think clearly", "I am not easily discouraged by failure"), participants were provided with a 5-point Likert-type scale that ranged from 0 (*not true at all*) to 4 (*true nearly all the time*). The 10-item version of the CD-RISC is a revised version of the original 25-item scale and has been found to be psychometrically superior in a sport context (see Gucciardi et al., 2011). In the current study, the scale was internally consistent ($\alpha = .88$).

3.4124 *Thriving*. Sport performers' perceptions of thriving were measured using the 10-item measure of thriving at work (Porath, Spreitzer, Gibson, & Garnett, 2012). Porath et al.'s (2012) measure of thriving is intended to assess the psychological state in which individuals experience both a sense of vitality and learning. Carver (1998) noted that resilience is similar to thriving in that they both reflect a capacity for positive adaptation. During the development and validation process, Porath et al. established a link between thriving and adaptive outcomes, including individual job performance and health. In the current study, participants were required to answer each item (e.g., "I have energy and spirit", "I continue to learn more and more as time goes by", "I feel alert and awake", "I see myself continually improving") on a 7-point Likert-type scale that ranged from 1 (*strongly disagree*) to 7 (*strongly agree*) using an adapted stem ("in my sport" instead of "at work"). The two subscales (viz. vitality and learning) were internally consistent ($\alpha = .86$ and $\alpha = .84$).

3.413 ***Procedure.*** The procedures were the same as those outlined in Study 2. The SRS was completed by the full sample (n = 1566), and the additional validation measures

were completed by a sub-sample (*n* =918). See Table 3.1 for more information about the respective samples.

3.414 ***Data analysis.*** The 46-item SRS was analyzed with CFA using MPlus version 6.12 (Muthén & Muthén, 2011). One item from each of the nine factors was fixed to 1.0 for the purposes of identification and latent variable scaling. The adequacy of the model to the data was evaluated using multiple fit indices, namely the chi-square (χ^2) statistic, the comparative fit index (CFI; Bentler, 1990), the Tucker-Lewis index (TLI; Tucker & Lewis, 1973), the standardized root mean square residual (SRMR; Hu & Bentler, 1998), and the root mean square error of approximation (RMSEA; Steiger, 1990). Although values indicative of acceptable model fit remain controversial (Markland, 2007; Marsh, Hau, & Wen, 2004), it is typically accepted that an excellent fit between the hypothesized model and the data is indicated by values of around .08 for the SRMR and around .06 for the RMSEA (Hu & Bentler, 1999). For the CFI and TLI, a value of ≥ .90 is considered to indicate adequate fit whereas a value of ≥ .95 is thought to signify excellent fit (Hu & Bentler, 1999; Marsh et al., 2004; Schmeller-Engel, Moosbrugger, & Müller, 2003). In this study, these values were used as guides rather than absolute values (cf. Marsh et al., 2004), since the χ^2 statistic and fit indices are not immune to misspecification; therefore, given values for each should not be interpreted as golden rules (Heene, Hilbert, Draxler, Ziegler, & Bühner, 2011), but rather the overall fit of a model should be assessed by considering several statistics in combination (Williams, Vandenberg, & Edwards, 2009). Therefore, in addition to the fit indices, modification indices, standardized residuals, and standardized factor loadings were analyzed for model misspecification. Any items that displayed a large standardized residual (>|2.00|) or standardized factor loadings below .40 were considered for removal.

3.42 Results and discussion.

3.421 ***Descriptive statistics*****.** Stressors, protective factors, and positive adaptation had overall mean scores of 2.02, 3.79, and 3.82 (out of 5) respectively. In terms of stressors, the participants in this sample appeared to experience a low-moderate frequency of Performance and Self Presentation Issues (*M* = 2.43), Coach Issues (*M* = 1.65), and Personal Commitments and Circumstances (*M* = 1.99). In terms of protective factors, the participants in this sample appeared to have moderate-high levels of Perceived Social Support (*M* = 3.79), Autonomous Values and Beliefs (*M* = 4.22), Robust Confidence (*M* = 3.25), and Proactive Personality (*M* = 3.91). In terms of positive adaptation, the participants in this sample demonstrated moderate-high levels of Perceived Sport Competence (*M* = 3.73) and Hedonic Well-Being (*M* = 3.90). All item means and standard deviations are presented in Table 3.5.

3.422 ***Confirmatory factor analyses.*** Results of the initial CFA suggested that modifications were required: $\chi^2_{(1733)} = 8536.33$, $p < .001$, RMSEA = .05, SRMR = .05, CFI = .82, TLI = .81. Therefore, in a sequence of CFAs, 10 problematic items were subsequently removed. Excluding these 10 items improved the fit of the model to the data: $\chi^2_{(588)} = 2626.99$, $p < .001$, RMSEA = .05, SRMR = .04, CFI = .90, TLI = .90 (see Table 3.5 for item means, standard deviations, and standardized factor loadings). These values indicate that the model is excellent if adopting the RMSEA and SRMR guidelines, and adequate if adopting the CFI and TLI guidelines.

The highest correlation between the nine factors was .67 (viz. between Autonomous Values and Beliefs and Proactive Personality). Since this value is < .85, this finding provides initial evidence for the discriminant validity of the factors (Kline, 2005). In addition, the average variance extracted (AVE) was examined using Fornell and Larcker's (1981) technique to test convergent validity. An AVE of ≥ .5 suggests adequate convergent validity (Hair, Black, Babin, Anderson & Tatham, 2006). Six of the nine factors had an AVE of ≥ .5. Of the three factors (viz. Personal Commitments and Circumstances, Autonomous Values and Beliefs, Proactive Personality) with an AVE of < .5, attention was subsequently given to another indicator to demonstrate the items within these three factors had convergent validity. Specifically, the standardized factor loadings for all of the observed variables were ≥ .5 which indicated that all of the items demonstrated adequate convergent validity (Hair et al., 2006). To evaluate discriminant validity in a more rigorous fashion, the AVEs were compared to the squared correlation estimates (Fornell & Larcker, 1981). The majority of the AVEs were greater than the squared correlation estimates thus further supporting the discriminant validity of the factors. Regarding reliability, the majority of the factors were internally consistent ($\alpha \geq .75$). The only exceptions were the Personal Commitments and Circumstances factor ($\alpha = .61$), the Autonomous Values and Beliefs factor ($\alpha = .68$), and the Proactive Personality factor ($\alpha = .62$). To provide further evidence for internal reliability, all items were assessed against the aforementioned item analysis criteria (Kidder & Judd, 1986; Nunnally & Bernstein, 1994). All of the items met all of the criteria and thus, the 36 items were subsequently retained within the final SRS.

As suggested in the CFA literature (cf. Byrne, 2011; Jackson, Gillaspy, & Purc-Stephenson, 2009), alterative models were run to determine whether the first-order, nine-factor, 36-item model demonstrated the best fit to the observed data. First, a hierarchical model was tested in which the nine first-order factors were represented by one higher-order factor (viz. psychological resilience). The fit of the hierarchical measurement model was

Table 3.5 *Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following CFA (Study Three)*

SRS Subscale and Item	*M*	*SD*	Loading	Skewness	Kurtosis
Performance and Self Presentation Issues					
Others' expectations of my performance	2.50	1.12	0.76	0.48	-0.48
A dip in my usual levels of performance	2.34	0.95	0.62	0.81	0.41
My mental preparation for competition	2.13	1.00	0.66	0.85	0.36
My performance being evaluated by others in my teams	2.22	1.09	0.72	0.78	-0.06
Making mistakes during competition	2.44	1.04	0.66	0.65	-0.12
Not wanting to let others down	2.93	1.23	0.70	0.22	-0.96
Coach Issues					
The relationship with my coach	1.69	0.91	0.82	1.50	2.15
My coach's behaviour	1.61	0.92	0.81	1.61	2.15
Personal Commitments and Circumstances					
My family responsibilities	2.00	1.06	0.49	0.97	0.22
A lack of personal finances	2.14	1.20	0.51	0.91	-0.13
My relationship with significant others	1.92	1.01	0.59	1.10	0.72
My travel arrangements for training or competition	1.91	1.05	0.53	1.10	0.52
Perceived Social Support					
Someone would have showed concern for me if I needed help	3.92	0.83	0.72	-0.86	0.98
Someone would have increased my confidence to deal with pressure if needed	3.56	0.89	0.72	-0.46	-0.04
Someone would have been there for me if I needed support	4.02	0.83	0.74	-0.90	1.02
Other people would have boosted my sense of competence if needed	3.67	0.79	0.75	-0.58	0.41
Autonomous Values and Beliefs					
I enjoyed competing against others	4.37	0.74	0.53	-1.38	2.99
My sport provided me with an opportunity to be myself	4.15	0.79	0.65	-0.92	1.16
Participation in my sport allowed me to live in a way that was true to my values	3.95	0.81	0.62	-0.60	0.46
I have valued the benefits of my sport	4.42	0.66	0.58	-1.16	2.53
Robust Confidence					
If I made a mistake, my confidence was not badly affected	3.23	1.05	0.75	-0.27	-0.79
Negative feedback from others has not affected my levels of confidence	3.07	1.06	0.65	0.00	-0.79
My confidence has remained stable	3.44	1.03	0.73	-0.43	-0.58
Proactive Personality					
I have constantly been looking for better ways to do things in training or competition	4.06	0.80	0.54	-0.68	0.27
I have actively chosen to engage with challenging situations	3.92	0.82	0.64	-0.73	0.65
I have identified opportunities in the environment to improve my performance in sport	3.75	0.85	0.60	-0.57	0.14

Table 3.5 Continued *Item Means, Standard Deviations, Factor Loadings, and Skewness and Kurtosis Values Following CFA (Study Three)*

SRS Subscale and Item	*M*	*SD*	Loading	Skewness	Kurtosis
Perceived Sport Competence					
I felt I have been good at my sport	3.89	0.85	0.78	-0.97	1.33
I have felt successful at my sport	3.83	0.90	0.80	-0.80	0.54
I have been satisfied with my individual performance in my sport	3.62	0.96	0.80	-0.70	0.01
I have had the ability to perform well in my sport	3.96	0.81	0.75	-1.00	1.71
I have been satisfied with the improvement of my skill level	3.60	0.95	0.67	-0.53	-0.24
I have been satisfied with the degree to which I have reached my performance goals	3.48	0.92	0.72	-0.48	-0.23
Hedonic Well-being					
I had a sense of direction and purpose in life	3.92	0.87	0.61	-0.96	1.24
I achieved important things in my life	3.86	0.87	0.62	-0.67	0.42
I have been satisfied with my life	3.84	0.91	0.90	-0.82	0.62
I have been happy with my life	3.96	0.87	0.88	-0.88	0.90

worse than the 36-item model (though better than the nine-factor, first-order, 46-item model): $\chi 2$ (585) = 3684.67, $p < .001$, RMSEA = .06, SRMR = .08, CFI = .86, TLI = .85. Second, another hierarchical model was tested in which the nine first-order factors were represented by three higher-order factors (viz. stressors, protective factors, positive adaptation). The fit of the hierarchical measurement model was worse than the 36-item model (though better than the nine-factor, first-order, 46-item model, and the first hierarchical model): $\chi 2$ (582) = 3097.04, $p < .001$, RMSEA = .05, SRMR = .06, CFI = .88, TLI = .88. Third, a one-factor model was tested (with the 36 items), which produced a very poor fit to the data: $\chi 2$ (594) = 12526.34, $p < .001$, RMSEA = .11, SRMR = .12, CFI = .45, TLI = .42. The implications of these findings will be discussed later.

3.423 ***Invariance testing.*** A sequential model testing approach was employed via multisample CFA to examine whether the SRS displayed invariance across different variables. These were: gender (male or female), sport type (team or individual), competitive level (low or high where club and county was classified as low, and collegiate/university, senior national, and international were classified as high), performance status (part-time or full-time), and competitive experience (low or high based on a median split). For each of these variables, a baseline model was established and then additional models were devised that were increasingly constrained. These models were specified to examine the equality of measurement (item loadings) and structural parameters (factor variances and covariances) of the SRS across the different groups (Byrne, 2011). Traditionally, invariance testing has used the ΔS-B χ^2 test statistic to indicate equality across groups; however, this test is sensitive to sample size (Tabachnick & Fidell, 2007). As a result, the recommendations of Cheung and Rensvold (2002) were followed. These recommendations indicate that a change in CFI of $\leq$ .01 is considered indicative of model invariance. For gender, the CFI value was .90 for both male and female athletes. For sport type, the CFI value was .90 for both team and individual sport participants. For competitive level, the CFI value was .89 for athletes competing at a low level and .90 for athletes competing at a high level. For performance status, the CFI value was .90 for part-time athletes and .89 for full-time athletes. For competitive experience, the CFI value was .90 for sport performers with low competitive experience and .89 for sport performers with high competitive experience. Thus, the change in CFI values was $\leq$ .01 in all of the analyses. These findings support the equality of factor loadings, variances, and covariances on the SRS across gender, sport type, competitive level, performance status, and competitive experience.

3.424 ***Concurrent validity.*** Table 3.6 shows the correlations between the SRS scales

Table 3.6 *Correlations Between Sport Resilience, Perceived Stress, Resilient Qualities, and Thriving (Study Three)*

	Variable	Sample Size	*M*	*SD*	1	2	3	4	5	6	7	8	9
1	Performance and Self Presentation Issues	1566	2.43	1.07	0.84								
2	Coach Issues	1566	1.65	0.91	0.44	0.80							
3	Personal Commitments and Circumstances	1566	1.99	1.08	0.59	0.38	0.61						
4	Perceived Social Support	1566	3.79	0.83	-0.11	-0.11	-0.10	0.82					
5	Autonomous Values and Beliefs	1566	4.22	0.75	-0.11	-0.12	-0.01	0.53	0.68				
6	Robust Confidence	1566	3.25	1.05	-0.56	-0.25	-0.20	0.31	0.46	0.75			
7	Proactive Personality	1566	3.91	0.82	0.01	0.00	0.13	0.46	0.67	0.42	0.62		
8	Perceived Sport Competence	1566	3.73	0.90	-0.20	-0.04	-0.04	0.33	0.56	0.49	0.48	0.89	
9	Hedonic Well-being	1566	3.90	0.88	-0.19	-0.05	-0.21	0.37	0.44	0.38	0.40	0.60	0.84
10	Perceived Stress	918	2.64	0.97	0.46	0.21	0.43	-0.18	-0.23	-0.50	-0.19	-0.31	-0.52
11	Resilient Qualities	918	3.92	0.86	-0.27	-0.03	*-0.09*	0.28	0.40	0.52	0.47	0.35	0.47
12	Thriving – Vitality	918	5.65	1.19	-0.14	-0.05	-0.08	0.36	0.56	0.39	0.46	0.46	0.49
13	Thriving – Learning	918	5.71	1.20	0.00	0.03	0.06	0.35	0.42	0.27	0.64	0.42	0.35

Note. Cronbach's alpha values appear on the matrix diagonal. Pearson's *r* values appear below the matrix diagonal (underlined values significant at $p < 0.01$; italic values significant at $p < 0.05$).

and other variables.

3.4241 *Stressors and perceived stress.* Performance and Self Presentation Issues, Coach Issues, and Personal Commitments and Circumstances were all significantly correlated with perceived stress (r = .21 to .46, p < .01).

3.4242 *Protective factors and resilient qualities.* There was a significant correlation between the sport-specific protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality) and the general resilient qualities (r = .28 to .52), p < .01).

3.4243 *Positive adaptation and thriving.* Perceived Sport Competence was significantly correlated with both the thriving subscales: learning (r = .42, p < .01) and vitality (r = .46, p < .01). In addition, there was a significant positive correlation between hedonic well-being and both learning (r = .35, p < .01) and vitality (r = .49, p < .01).

3.5 General Discussion

Although psychological resilience is important in competitive sport (Fletcher & Sarkar, 2012), to date no measure has been developed to comprehensively and accurately assess this phenomenon in the sport context. Chapter three sought to address this issue by developing and validating the SRS via a series of three related studies. Based on the tripartite conceptualization of psychological resilience (this volume, chapter two, part one), the outcome was a 36-item scale that assesses the three components of psychological resilience (viz. stressors, protective factors, and positive adaptation) via nine subscales: Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances, Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being. Analyses indicate that the SRS provides a valid and reliable measure of psychological resilience in sport performers.

Underpinned by previous qualitative studies and reviews in this area (viz. Fletcher & Sarkar, 2012; this volume, chapter two, parts one & two), the nine factors emerging from this research represent parsimonious, but inclusive, subscales of the three components of psychological resilience in athletes. Specifically, the factors provide a detailed indication of stressors (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances), protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality), and positive adaptation (viz. Perceived Sport Competence, Hedonic Well-Being). Although the items representing stressors and protective factors were originally based on the three sub-categories of stressors (viz. competitive performance, the sport organization within which the athletes

operate, personal life events) and five sub-categories of protective factors (viz. positive personality, motivation, confidence, focus, perceived social support) identified in previous work in this area (Fletcher & Sarkar, 2012; this volume, chapter two, part two), the results reported here indicate that it was not possible to extract all of these broad factors and that specialized factors are more appropriate. Hence, although it is possible to subjectively identify all-encompassing subcategories of resilience-related factors, the conceptual links and empirical relationships between them point to a more fine-grained approach to the assessment of psychological resilience.

The first-order, nine-factor, 36-item model tested in Study 3 did not meet Hu and Bentler's (1999) revised CFI cutoff value of .95. Nonetheless, the measurement model met the SRMR, RMSEA and original CFI guidelines (cf. Bentler, 1992). Thus, the SRS demonstrates acceptable factorial validity when measuring psychological resilience in sport performers; however, future research should continue to test the factor structure, validity, and reliability of the SRS further. Exploratory structural equation modeling (ESEM; Asparouhov & Muthén, 2009) should be considered as a viable approach in this regard since it is an invaluable method particularly during a period of iterative model development (cf. Booth & Hughes, 2014). Within these tests, scholars should examine the three factors in the SRS (viz. Personal Commitments and Circumstances, Autonomous Values and Beliefs, Proactive Personality) that appear to have statistical deficiencies regarding internal consistency (α = .61 to .68). Although these factors met all item analysis criteria (cf. Kidder & Judd, 1986; Nunnally & Bernstein, 1994) and the factor structure was deemed valid in this research, future research should examine the psychometric properties of these three factors. Moreover, although the two-item factor relating to Coach Issues was deemed reliable (α = .80), researchers should further examine this factor in the SRS since it is generally accepted that subscales should consist of three or more items (Howell, 2011; MacCallum, Browne, & Sugawara, 1996; Tabachnick & Fidell, 2007).

In addition to examining the nine-factor model in Study 3, a one-factor structure was also tested; however, this displayed a very poor fit to the data. This finding indicates that psychological resilience is a multifaceted construct that is best represented by a number of separate, albeit related, factors (cf. this volume, chapter two, part one). In Study 3, a hierarchical structure was also tested in which the nine first-order factors were represented by three higher-order factors (viz. stressors, protective factors, positive adaptation). This model produced fit values that were only marginally lower than that of the first-order, 36-item model. Marsh (1987) remarked that the fit of a second-order model cannot be better than the

fit of the equivalent first-order structure; therefore, he suggested that if the fit of the higher model approaches that of the first-order model, the hierarchical structure should be preferred because it is more parsimonious. As a result, it is suggested that the hierarchical model should be adopted by researchers interested in a general measure of psychological resilience (e.g., when measuring resilience in complex structural equation modelling). However, for those examining the relationships between specific resilience-related factors and other concepts, the nine-factor model will most likely be applicable since it provides a more in-depth assessment. Study 3 also provided support for the factorial invariance of the measurement model by finding that the factor loadings, variances, and covariances were equivalent across gender, sport type, competitive level, performance status, and competitive experience. As a result, it is possible for researchers to assess psychological resilience across different groups of sport performers and make meaningful comparisons between them (cf. Vandenberg & Lance, 2000).

This research found support for the concurrent validity of the SRS by reporting significant correlations between stressors (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances) and perceived stress, sport-specific protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality) and general resilient qualities, and positive adaptation (viz. Perceived Sport Competence, Hedonic Well-Being) and thriving. Some of these relationships are in accordance with the extant literature in sport psychology, which has indicated that stressors can be perceived as stressful (see, e.g., Didymus & Fletcher, 2012; Dugdale et al., 2002; Nicholls, Polman, & Levy, 2012), and that positive adaptation is related to thriving (see, e.g., Sarkar & Fletcher, 2014a). However, future empirical research is required to examine in greater detail the correlations reported in this paper. From a theoretical perspective, the model of sport resilience (Fletcher & Sarkar, 2012) posits that numerous protective factors shield athletes from the potential negative effects of stressors by influencing their challenge appraisal. To examine the relationship between stressors, protective factors, positive adaptation, and other resilience-related mechanisms (e.g., cognitive appraisal), future research should use the grounded theory of psychological resilience to generate research questions and hypotheses about resilience in sport (this volume, chapter two, part two) using statistical techniques, such as moderation and mediation analyses, to answer them (cf. Hayes, 2009; 2013).

This research has developed the first valid and reliable measure of psychological resilience in sport performers. In contrast to previous measures applied in the sport context,

which only assess individual resilient qualities (see, e.g., Gucciardi et al., 2011), the SRS can be used to assess all three components of psychological resilience (viz. stressors, protective factors, and positive adaptation) in competitive sport. Notwithstanding this strength, it is worth highlighting some of the limitations of the series of studies reported here. First, like most other measures of resilience in the general psychology literature (see, for a review, Windle et al., 2011), this research relied solely on self-report data. Although an individual's own reports provide insights into his or her perceptions of resilience, the self-report of resilience can be confounded by sociocultural constructions (cf. Ungar & Liebenberg, 2011). To address this limitation, future research should consider adopting a triangulation strategy, which incorporates multiple methods (e.g., self-reports, observations, physiological indices) into a study design so that the drawbacks of one method can be attenuated by the strengths of another (cf. this volume, chapter two, part one). An individual's self-report can also be influenced by memory bias. The SRS asks participants about pressures experienced, personal qualities and thoughts displayed, and feelings about sport and life, in the past month because the authors deemed this to be an appropriate time period for recalling stressors, protective factors, and positive adaptation. Some research suggests, however, that retrospective reports of one's experiences over time tend not to be accurate (cf. Thomas & Diener, 1990). As a result, to minimize memory bias, future research should attempt to validate the SRS with different temporal instructions (e.g., over the past day or week) and incorporate the SRS into methods such as daily diaries (cf. Almeida, 2005). A second limitation of this research was the cross-sectional and correlational nature of the data collected. This approach was appropriate for developing and validating the measure and initially exploring relationships in this area; however, future research should adopt longitudinal designs to better capture the complex and dynamic nature of psychological resilience (cf. Gucciardi et al., 2011; this volume, chapter two, part one).

To conclude, the three related studies presented here report the development and validation of a psychometrically sound scale that assesses psychological resilience in athletes. This scale – labelled the Sport Resilience Scale (SRS) – measures the three components of psychological resilience (viz. stressors, protective factors, and positive adaptation) via nine subscales: Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances, Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being.

Chapter Four: Empirical Research: Studies Four and Five

In the previous chapter, I described the development and validation of the Sport Resilience Scale (SRS). Specifically, the research provided content validity for a pool of items designed to reflect psychological resilience in athletes (Study 1), examined the factorial structure of the SRS using exploratory factor analysis (Study 2), found support for the 9-factor structure of the SRS via confirmatory factor analyses, and provided evidence for the SRS's concurrent validity and invariance across different groups (Study 3). Using the SRS developed and validated in chapter three, and based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience, the aim of chapter four is to investigate resilience in sport performers via an examination of moderation and mediation hypotheses in two separate – but related – studies. Specifically, I test whether the association between the stressors athletes encounter and athletes' positive adaptation is moderated by the protective factors that athletes possess (Study 4) and whether the association between the stressors athletes encounter and athletes' positive adaptation is mediated by their cognitive appraisal processes (Study 5).

Psychological Resilience in Sport Performers: An Examination of Moderation and Mediation Hypotheses

4.1 Introduction

Psychological resilience represents an important phenomenon that describes the ability to use personal qualities to withstand pressure. Fletcher and Sarkar recently defined psychological resilience as "the role of mental processes and behavior in promoting personal assets and protecting an individual from the potential negative effect of stressors" (Fletcher & Sarkar, 2012, p. 675, 2013, p. 16). This definition encapsulates aspects of both trait and process conceptualizations of resilience (cf. Fletcher & Sarkar, 2012, 2013). Regarding the

trait conceptualization, the "mental processes and behavior" enable individuals to adapt to the circumstances they encounter (cf. Connor & Davidson, 2003). The process conceptualization of resilience recognizes that it is a capacity that develops over time in the context of person-environment interactions (Egeland et al., 1993). Central to the definition is the focusing of the conceptual lens on the *role* that psychological-related phenomena play – rather than the mental processes and behavior per se – in avoiding negative consequences.

Over the past few years, researchers have begun to investigate psychological resilience in sport performers (e.g., Fletcher & Sarkar, 2012; Galli & Vealey, 2008). In one of the initial sport resilience studies, Galli and Vealey (2008) interviewed college and professional athletes about their perceptions and experiences of resilience using Richardson (2002) and colleagues' (1990) resiliency model. Galli and Vealey found that various personal resources (e.g., being positive, determination, competitiveness, persistence) positively influenced the athletes' resilience process (described as 'agitation' by the authors). Although there has been some support for Richardson's model in relation to health promotion (e.g., Walker, 1996), it is not without its limitations including the linear stage framework evident within its structure, the absence of meta-cognitive and -emotive processes, and its bias toward coping-orientated processes (cf. Fletcher & Sarkar, 2013). These drawbacks are of particular concern since Richardson's model was used to help formulate questions for the interview guide and guide data analysis.

In recognizing the limitation of such approaches to conducting qualitative research, Fletcher and Sarkar (2012) developed a theory of resilience, grounded in original data, which is free from the constraints of a preconceived model. They interviewed twelve Olympic champions to explore and explain the relationship between psychological resilience and optimal sport performance. The findings revealed that numerous psychological factors (relating to a positive personality, motivation, confidence, focus, and perceived social support) protected the world's best athletes from the potential negative effect of stressors by influencing their challenge appraisal and meta-cognitions. These constructive cognitive reactions promoted facilitative responses that led to the realization of optimal sport performance. In part two of chapter two, I acknowledged that the grounded theory is relatively new and currently untested and thus, to determine the utility of the model, future studies should use it to generate research questions and hypotheses about resilience in sport.

Based on the grounded theory of psychological resilience (Fletcher & Sarkar, 2012), I propose two hypotheses in chapter four. First, I hypothesize that the association between the stressors athletes encounter and athletes' positive adaptation will be moderated by the

protective factors that athletes possess (see Figure 4.1). Specifically, I anticipate that the negative association between stressors and positive adaptation will be weaker for those athletes that display higher levels of protective factors. Second, I hypothesize that the association between the stressors athletes encounter and athletes' positive adaptation will be mediated by their cognitive appraisal processes. Specifically, I postulate that athletes' appraisal of stressors as a challenge would predict higher positive adaptation and athletes' appraisal of stressors as a threat would predict lower positive adaptation (see Figure 4.2). I describe the conceptual and empirical foundations for these hypotheses forthwith.

4.11 Moderation by protective factors. Protective factors are defined as "influences that modify, ameliorate, or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome" (Rutter, 1985 p. 600). Qualities identified in the resilience literature include self-efficacy, supportive parenting, and involvement in prosocial activities (see, for a review, Luthar, 2006; Masten & Reed, 2002; Rutter, 2000). Rutter's (1987) conceptualization suggests a differential or variable impact of protection on the relation between risk and behavioral outcomes such that its impact is most evident when protection is high, and its influence is more limited when protection is low. Within the general psychology literature, various studies have found that protective factors buffer, shield, or insulate individuals from the negative effects of stressors (see, e.g., Baldry & Farrington, 2005; Dilorio, Dudley, Soet, & McCarthy, 2004; Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). To illustrate, Jessor et al. (1995) found that protective factors served to moderate the relationship between risk and adolescent problem behavior (e.g., alcohol and drug abuse). Dilorio et al. (2004) also found a moderation effect of protective factors such that adolescents reporting both high risk and high protection were less likely to indicate involvement in sexual behaviors compared with adolescents reporting high risk and low protection. Similarly, Baldry and Farrington (2005) found that protective factors moderated the negative effects of risk factors on bullying and victimization.

Turning back briefly to the grounded theory (Fletcher & Sarkar, 2012), according to the Olympic champions, an integral aspect of the resilience-performance relationship was their ability to utilize and optimize a constellation of characteristics to withstand the stressors they encountered. This supports the trait conception of resilience and Rutter's (1987) view that psychological resilience is "the positive role of individual differences in people's response to stress and adversity" (p. 316). This "positive [moderating] role" of protective factors has yet to be quantitatively tested and I aim to address this in chapter four.

4.12 Mediation by cognitive appraisal. Cognitive appraisal is an intra-individual

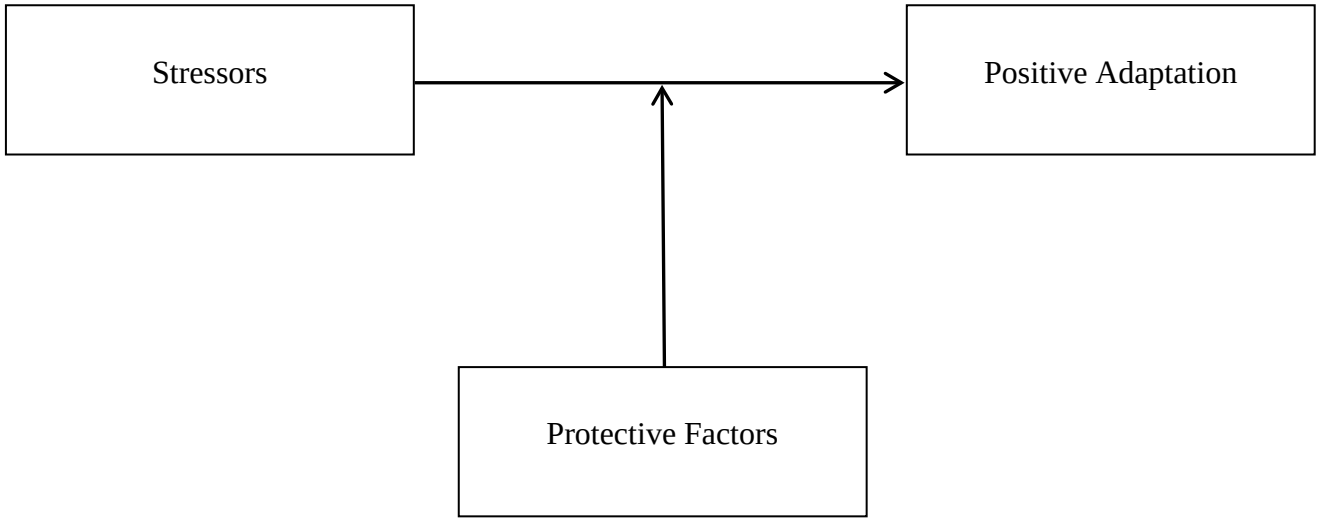

Figure 4.1. The hypothesized resilience moderation model of stressors, protective factors, and positive adaptation (Study four).

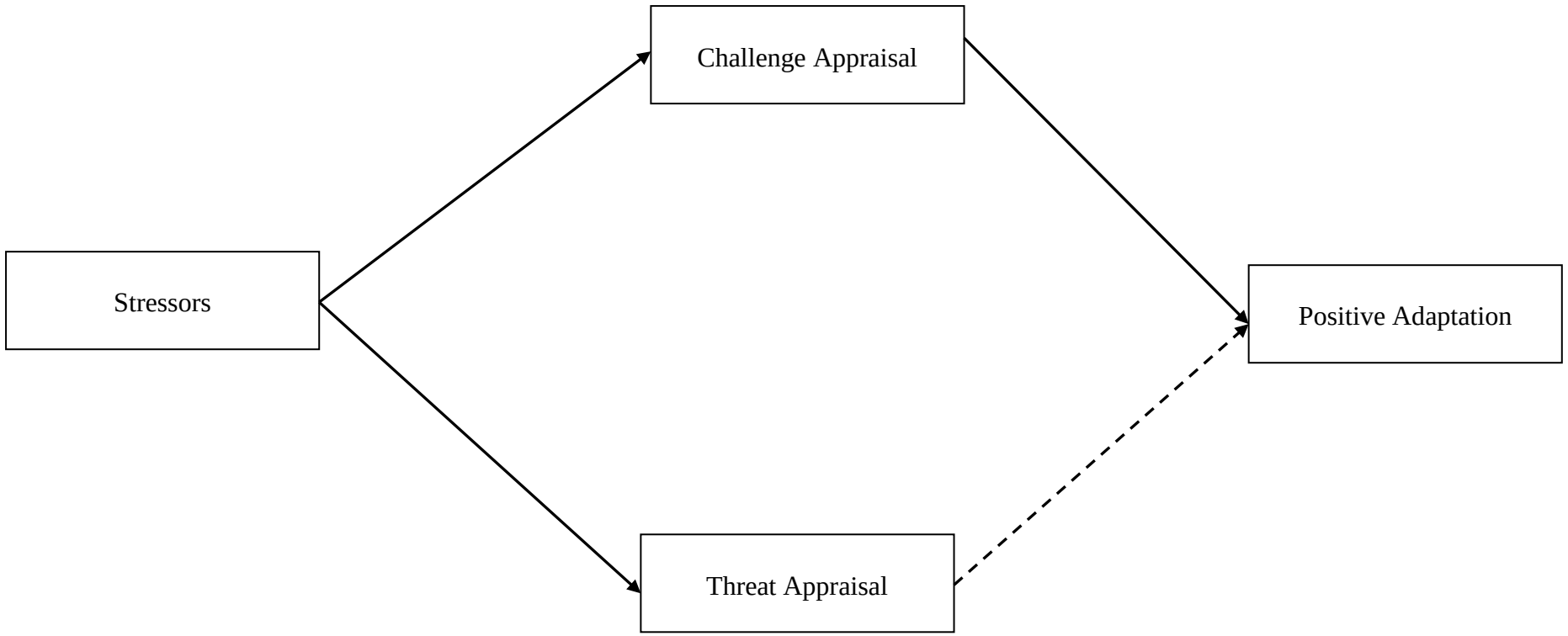

Figure 4.2. The hypothesized resilience mediation model of stressors, challenge/threat appraisal, and positive adaptation (Study five). *Note*. dashed lines indicate a hypothesized negative relationship; un-dashed lines indicate a hypothesized positive relationship.

mechanism that lies at "the theoretical heart of psychological stress" (Lazarus, 1999, p. 61). Appraisal refers to an individual's evaluations of demands and the meaning he or she ascribes to such encounters (Lazarus & Folkman, 1984). In their hypothesized model of resilience, Mancini and Bonnano (2009) proposed that appraisal processes are an important mechanism of resilience specifically playing a critical mediating role in promoting positive adaptation. According to Lazarus (1999), there are two main types of appraisals: *challenge* and *threat*. Challenge appraisal occurs when evaluated resources meet or exceed demands, whereas threat appraisal occurs when demands exceed resources. Based on the biopsychosocial model of challenge and threat (BPS; Blascovich, 2008; Blascovich & Tomaka, 1996), Seery (2011a) proposed, in relation to the potential stress of motivated performance situations, that evaluations of challenge typically reflect resilience and evaluations of threat typically reflect vulnerability. In terms of empirical evidence, within the general psychology literature, resilience research findings have revealed the mediating role of cognitive appraisal (see, e.g., Major et al., 1998; Mancini & Bonnano, 2009) with challenge appraisal predicting higher positive adaptation and threat appraisal predicting lower positive adaptation (see, e.g., Bonnano, Kennedy, Galatzer-Levy, Lude, & Elfström, 2012; Riolli, Savicki, & Spain, 2010; Schubroeck et al., 2011; Tugade & Fredickson, 2004).

Turning back briefly to the grounded theory (Fletcher & Sarkar, 2012), the core component of the model is based on the positive evaluation of stressors. The world's best athletes tended to perceive stressors as opportunities for growth, development, and mastery. More specifically, Olympic champions believed that stressors provided them with opportunities to develop a "psychological and competitive edge" over their peers and opposition. To illustrate, not being selected for a major international competition was frequently cited as ultimately a source of increased effort, and competition losses were viewed as learning opportunities for subsequent performances. This mediating role of appraisal has yet to be quantitatively tested and I aim to address this in chapter four.

4.13 Summary. From a theoretical perspective, Fletcher and Sarkar's (2012) model of sport resilience posits that protective factors shield athletes from the potential negative effects of stressors by influencing their challenge appraisal. To determine the utility of the model and advance knowledge in this area by explaining resilience across a wide range of athletes and sport settings, in chapter three, I noted that future studies should use it to generate research questions and hypotheses about resilience in sport using moderation and mediation statistical techniques. With conceptual and empirical foundations in the mainstream resilience literature (cf. Rutter, 1987; Seery, 2011a), the purpose of chapter four

is to investigate psychological resilience in sport performers via an examination of moderation and mediation hypotheses in two separate – yet related – studies.

4.2 Study Four

The aim of Study 4 is to test the hypothesis that the association between the stressors athletes encounter and athletes' positive adaptation is moderated by the protective factors that athletes possess (see Figure 4.1). Specifically, I anticipated that the negative association between stressors and positive adaptation would be weaker for those athletes that displayed higher levels of protective factors.

4.21 Method.

4.211 ***Participants.*** Participants[1] were 1566 competitive sport performers (818 male, 748 female) with a mean age of 28.44 years (*SD* = 11.99) and an average of 13.73 years (*SD* = 10.90) of competitive sport experience. Collectively, the athletes represented 51 nationalities, participated in 73 individual and team sports, and competed at a wide variety of performance levels: club (*n* = 545), county (*n* = 118), junior national (*n* = 34), state/regional (*n* = 81), collegiate/university (*n* = 371), senior national (*n* = 187), and international (*n* = 213).

4.212 ***Procedure.*** Before data collection, ethical approval was provided by Loughborough University ethics committee for the two studies reported in chapter four, which were conducted in accordance with American Psychological Association's (2010) guidelines. Participants were recruited via a standardized email addressed to a variety of sport personnel who were asked to circulate the email to athletes. The email detailed eligibility criteria – that participants must be 18 years or above and have participated in competitive sport within the last month – and contained a web link to an online questionnaire hosted by Bristol Online Surveys (www.survey.bris.ac.uk). The first page of the survey contained various pieces of information including an introduction to the study, an estimated time of completion, an encouragement to share experiences in an open and honest manner, and reassurances that responses would be confidential and anonymous. Once participants understood the purpose and nature of the study and consented to complete it, they were presented with a series of web pages containing demographic information and the questionnaire items.

4.213 ***Measure*****.**

4.2131 *Sport Resilience Scale (SRS; this volume, chapter three).* The SRS is a 36-item

[1] The data collected in studies four and five (chapter four) was collected at the same time as the data reported in studies one-three (chapter three); hence the identical samples.

scale that assesses psychological resilience in sport performers via nine subscales: Performance and Self Presentation Issues (6 items; e.g., In the past month, I have experienced pressure associated with others' expectations of my performance), Coach Issues (2 items; e.g., In the past month, I have experienced pressure associated with the relationship with my coach), Personal Commitments and Circumstances (4 items; e.g., In the past month, I have experienced pressure associated with my family responsibilities), Perceived Social Support (4 items; e.g., In the past month, someone would have showed concern for me if I needed help), Autonomous Values and Beliefs (4 items; e.g., In the past month, my sport provided me with an opportunity to be myself), Robust Confidence (3 items; e.g., In the past month, my confidence has remained stable), Proactive Personality (3 items; e.g., In the past month, I have actively chosen to engage with challenging situations), Perceived Sport Competence (6 items; e.g., In the past month, I have felt successful at my sport) and Hedonic Well-Being (4 items; e.g., In the past month, I have been happy with my life). Performance and Self Presentation Issues, Coach Issues, and Personal Commitments and Circumstances are measured on a 5-point Likert scale ranging from 1 = *never* to 5 = *always*. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being are measured on a 5-point Likert scale ranging from 1 = *strongly disagree* to 5 = *strongly agree* (see Appendix 4 and 5).

In accordance with the aforementioned recommendations (this volume, chapter three), a hierarchical structure was used in the current study in which the nine first-order factors were represented by three higher-order factors: Stressors (Performance and Self Presentation Issues, Coach Issues, and Personal Commitments and Circumstances), Protective Factors (Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, and Proactive Personality), and Positive Adaptation (Perceived Sport Competence and Hedonic Well-Being). This structure produced fit values ($\chi^2_{(582)} = 3097.04$, $p < .001$, RMSEA = .05, CFI = .88, TLI = .88) that were only marginally lower than that of the first-order, 36-item model ($\chi^2_{(588)} = 2626.99$, $p < .001$, RMSEA = .05, CFI = .90, TLI = .90), and each higher-order factor demonstrated excellent internal consistency (α = .83, .82, and .90 for Stressors, Protective Factors, and Positive Adaptation respectively). This broader model of psychological resilience adopted for the current study was, therefore, deemed to be valid and reliable (cf. this volume, chapter three).

4.214 ***Data analysis.*** To investigate whether protective factors moderated the direct effect between stressors and positive adaptation, I used the analytic methods discussed in Preacher, Rucker, and Hayes (2007; see also Hayes, 2013). These procedures generated a

multiple regression model with positive adaptation specified as the dependent variable. The results of the overall model and the significance of all the pathways were examined. After establishing the significance of the interaction term, I calculated confidence intervals to determine the values of the moderator at which the conditional direct effect was significant[2]. Finally, I used the Johnson-Neyman technique (Johnson & Neyman, 1936; see also Curran, Hill, & Niemiec, 2013 for an application of this technique to conditional process modeling) to examine the regional significance of the conditional direct effect across a range of values of the moderator.

4.22 Results.

4.221 ***Preliminary analyses.*** There was no missing data since the online questionnaire programme prompted participants to complete a missed item. I examined the degree to which each item was normally distributed via the assessment of skewness and kurtosis. The skewness and kurtosis values were small to moderate and within the acceptable range (skewness, < |±2|; kurtosis, <|±7|; West Finch, & Curran, 1995), with scores ranging from -1.38 to 1.61 for skewness and from -.96 to 2.99 for kurtosis.

4.222 ***Descriptive statistics and scale reliabilities.*** Table 4.1 presents scale reliabilities (Cronbach's alpha), means, standard deviations, and intercorrelations for the study measures (Studies 4 and 5). The participants in this sample appeared to experience a relatively low frequency of stressors (M = 1.99), had moderate-high levels of protective factors (M = 3.82), and demonstrated moderate-high levels of positive adaptation (M = 3.80). Cronbach alpha coefficients were calculated to assess the reliability of the measures used. Internal consistency estimates for stressors, protective factors, and positive adaptation ranged from .82 to .90 (M = .85).

4.223 ***Main analyses.*** The regression model (see Table 4.2) indicated that stressors, protective factors, and the interaction of protective factors with stressors explained 31.9% of the variance in positive adaptation ($F_{(3,1562)}$ = 243.32, p <.001). Stressors predicted lower levels of positive adaptation (b = -.45, p <0.01), protective factors predicted higher levels of positive adaptation (b = .55, p <.001), and, importantly, the interaction of protective factors with stressors predicted higher levels of positive adaptation (b = .11, p <0.05).

As a result of the significant interaction term, I looked at the conditional direct effect

[2] These direct effects are termed "conditional" because they are calculated using a product term that includes the interaction coefficient and the level of the moderator (i.e., $b_1 + b_3M$, where $b1$ is the path from the independent variable to the dependent variable, $b3$ is the path from the interaction coefficient to the dependent variable, and M is the level of the moderator; see Hayes, 2013; Preacher et al., 2007). By contrast, unconditional direct effects are calculated in the absence of the moderator (i.e., $b1$).

Table 4.1 *Scale Reliabilities, Descriptive Statistics, and Intercorrelations for the Study Measures (Studies Four and Five)*

	Variable	Sample Size	*M*	*SD*	1	2	3	4	5
1	Stressors	1566	1.99	0.57	0.83				
2	Protective Factors	1566	3.82	0.47	-0.21	0.82			
3	Positive Adaptation	1566	3.80	0.65	-0.17	0.56	0.90		
4	Challenge Appraisal	648	3.11	1.13	0.13	0.35	0.32	0.88	
5	Threat Appraisal	648	1.12	1.05	0.47	-0.24	-0.21	0.07	0.87

Note. Scale reliabilities (Cronbach's alpha) appear on the matrix diagonal. Pearson's *r* values appear below the matrix diagonal (underlined values significant at $p < 0.01$).

Table 4.2 *Conditional Direct Effect of Stressors on Athletes' Positive Adaptation across Levels of Protective Factors (Study Four)*

Sample Size = 1566
Number of Bootstrap Resamples = 1,000

	Dependent Variable Model (DV = Positive Adaptation)			
Predictor	***b***	***SE***	***t***	
Protective Factors (b_2)	.5489	.3660	4.94***	
Stressors (b_1)	-.4536	.0943	-2.63**	
Interaction (b_3)	.1051	.1727	2.32*	
	Conditional Direct Effect at Different Values of Moderator			
Values of Moderator	$b_1 + b_3M$	***SE***	***LLCI***	***ULCI***
1 *SD* Below the Mean	-.1012	.0309	-.1618	-.0406
At the Mean	-.0520	.0241	-.0993	-.0046
1 *SD* Above the Mean	-.0027	.0333	-.0680	.0626

Notes. The conditional direct effect is calculated by $b_1 + b_3M$, where b_1 is the path from stressors to positive adaptation, b_3 is the path from the interaction of stressors with protective factors to positive adaptation and *M* is protective factors.
* $p < .05$, ** $p < .01$, *** $p < .001$

of stressors on athletes' positive adaptation across levels of protective factors (see Table 4.2). Initially, I determined the values of the moderator at which the conditional direct effect was significant. With 1000 resamples, the conditional direct effect was significant at 1 *SD* below the mean (95% CI: {-.1618, -.0406}) and at the mean (95% CI: {-.0993, -.0046}), but was non-significant at 1 *SD* above the mean (95% CI: {-.0680, .0626}) of protective factors. To further probe this moderation, I examined the regional significance of the conditional direct effect across a range of values of the moderator using the Johnson-Neyman technique (Johnson & Neyman, 1936). Results suggested that the conditional direct effect was restrictive (see Figure 4.3), such that the conditional direct effect was negative when protective factors were lower than 3.8 ($b_1 + b_3M$ = -.05; 95% CI: {-.0071, -.1016}) but non-significant when protective factors were higher than 4.0 ($b_1 + b_3M$ = -.03; 95% CI: {.0177, -.0843}). As such, stressors only predict lower positive adaptation when protective factors are low and have no (negative) effect on positive adaptation when protective factors are high.

4.3 Study Five

The aim of Study 5 is to test the hypothesis that the association between the stressors athletes encounter and athletes' positive adaptation is mediated by their cognitive appraisal processes. I anticipated that the relationship between stressors and positive adaptation would be indirectly influenced by challenge and threat appraisal in opposing ways. More specifically, I postulated that athletes' appraisal of stressors as a challenge would, in turn predict higher positive adaptation. By contrast, athletes' appraisal of stressors as a threat would, in turn, predict lower positive adaptation (see Figure 4.2).

4.31 Method.

4.311 ***Participants.*** A sub-sample of participants from Study 4 was used in this analysis. Participants were 648 competitive sport performers (280 male, 368 female) with a mean age of 27.68 years (*SD* = 12.18) and an average of 12.12 years (*SD* = 9.59) of competitive sport experience. Collectively, the athletes represented 34 nationalities, participated in 59 individual and team sports, and competed at a wide variety of performance levels: club (*n* = 142), county (*n* = 49), junior national (*n* = 19), state/regional (*n* = 28), collegiate/university (*n* = 193), senior national (*n* = 92), and international (*n* = 115).

4.312 ***Measures*** (see Appendix 6)**.**

4.3121 *Sport Resilience Scale (SRS; this volume, chapter three).* The 36-item SRS, as described in Study 4, was distributed to participants.

4.3122 *Appraisal of Life Events (ALE; Ferguson, Matthews, & Cox, 1999).* The ALE scale assesses an individual's perceived cognitive appraisal of different situations,

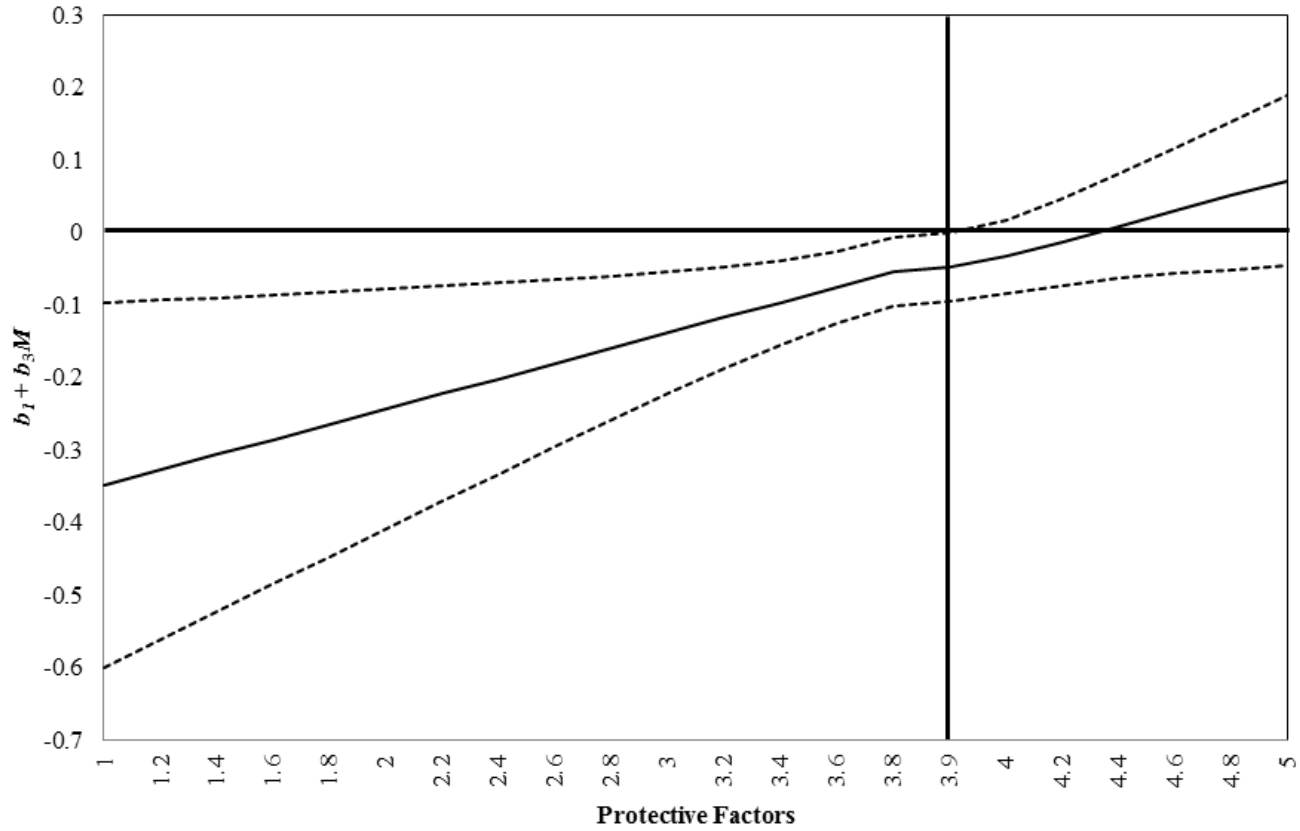

Figure 4.3. Plot of the conditional direct effect of stressors on athletes' positive adaptation across levels of protective factors (Study four). *Note.* $b_{1+}\, b_3M$ = the conditional direct effect. The solid plot depicts the trajectory of the conditional direct effect, and the dashed plots depict the upper and lower limits of the 95% CI. The vertical lines depict the boundaries of the regional significance of the conditional direct effect.

circumstances, and experiences across three dimensions: Participants were asked to appraise "pressures that you experienced in the past month" on 16 adjectives using a 5-point Likert scale from 1 (*not at all)* to 5 (*very much so). Challenge* (6 items; e.g., "enjoyable", "stimulating", "exciting"), the degree to which environmental demands are perceived as helpful for personal development and growth through the potential mastery of stressors; *Threat* (6 items; e.g., "fearful", "worrying", "hostile"), the degree to which environmental demands are perceived as hostile, apt to generate anxiety, and may be potentially harmful; and *Loss* (4 items; e.g., "painful", "depressing", "intolerable"), the potential for suffering and sadness. The three-factor ALE scale (i.e., challenge, threat, and loss) has been shown to have a stable factor structure, excellent internal reliability, high test-retest reliability, no significant associations with social desirability, and good construct validity with respect to stress process factors (Ferguson et al., 1999). Furthermore, it has been used effectively in previous resilience research (see, e.g., Riolli et al., 2010; Schaubroeck et al., 2011) In line with the research hypotheses, and guided by previous resilience research (see Seery, 2011a), I was specifically interested in athletes' challenge and threat appraisals.

4.313 ***Data analysis.*** The proposed model was tested using path analysis (AMOS version 18.0; Arbuckle, 2007) with the maximum-likelihood estimation (cf. Nicholls et al., 2012). This method allows for simultaneous examination of multiple direct and indirect predicted paths and provides global indices of the fit between the theoretical model and the data (Holmbeck, 1997). The following variables were included in the model: stressors, challenge appraisal, threat appraisal, and positive adaptation.

The adequacy of the model to the data was evaluated using a number of fit indices, namely the chi-square (χ^2) statistic, the root mean square error of approximation (RMSEA; Steiger, 1990), the comparative fit index (CFI; Bentler, 1990), and the incremental fit index (IFI; Bollen, 1989). The chi-squared statistic reflects the discrepancy between the observed covariance matrix derived from the data and the predicted covariance matrix by the model. The chi-square statistic is dependent on sample size, model complexity, and deviation from multivariate normality in the data (Hu & Bentler, 1998). In addition, a model is only an approximation in reality. Testing whether the observed and predicted covariance matrices are identical is too strict a criterion. The RMSEA was therefore reported. The RMSEA provides an estimate of the average absolute difference between the model covariance estimates and the observed covariance. A value of $\leq .06$ for the RMESA indicates an excellent fit whereas a value of $\leq .08$ is considered an acceptable fit (Browne & Cudek, 1993; Hu & Bentler, 1999). The CFI and IFI were also calculated. The CFI provides an indication of how the theoretical

model better fits the data in comparison to a baseline model constraining all constructs to be uncorrelated with one another. The IFI is computed by using ratios of the chi-squares of the theoretical model and the baseline model and the degrees of freedom for the two respective models. The CFI and IFI are more robust statistics than chi-square for deviations from multivariate normality. A CFI and IFI value of ≥ .95 is considered an excellent fit whereas a value of ≥ .90 is considered to indicate adequate fit (Hu & Bentler, 1999; Marsh et al., 2004; Schmeller-Engel et al., 2003). In this study, these values were used as guides rather than absolute values (cf. Marsh et al., 2004), since the χ^2 statistic and fit indices are not immune to misspecification; therefore, given values for each should not be interpreted as golden rules (Heene et al., 2011), but rather the overall fit of a model should be assessed by considering several statistics in combination (Williams et al., 2009).

To determine the statistical significance of the mediated pathways in the present study, indirect effects were calculated and their 95% confidence intervals were derived using a distribution of the products method (*PRODCLIN* programme; MacKinnon, Fritz, Williams & Lockwood, 2007; Tofighi & MacKinnon, 2011). Indirect effects are the product of the coefficients (i.e., *ab*; Hayes, 2009), where *a* is the path from the predictor to the mediator and *b* is the path from the mediator to the criterion. The 95% confidence interval denotes the upper and lower boundary of an indirect effect that would be observed 95 times out of 100 if a sample of the same size were to be drawn from the population. Provided that a null or zero effect is not observed between the upper and lower bound of the 95% confidence interval, the indirect effect is deemed significant at the $p < .05$ level.

4.32 Results.

4.321 ***Descriptive statistics and scale reliabilities.*** Table 4.1 presents scale reliabilities (Cronbach's alpha), means, standard deviations, and intercorrelations for the study measures (Studies 4 and 5). Similar to Study 4, participants in Study 5 appeared to experience a relatively low frequency of stressors ($M = 2.00$), had moderate-high levels of protective factors ($M = 3.83$), and demonstrated moderate-high levels of positive adaptation ($M = 3.79$). Cronbach alpha coefficients were calculated to assess the reliability of the measures used. The challenge appraisal and threat appraisal subscales were both internally consistent ($\alpha = .88$ and $\alpha = .87$ respectively). Table 4.1 also provides an overview of the bivariate correlations between the variables in the path model. All predicted relationships between the variables were observed (cf. Nicholls et al., 2012).

4.322 ***Path analysis.*** The hypothesized model that was tested can be seen in Figure 4.4. Fit indices suggested that the hypothesized model possessed an excellent fit to the data:

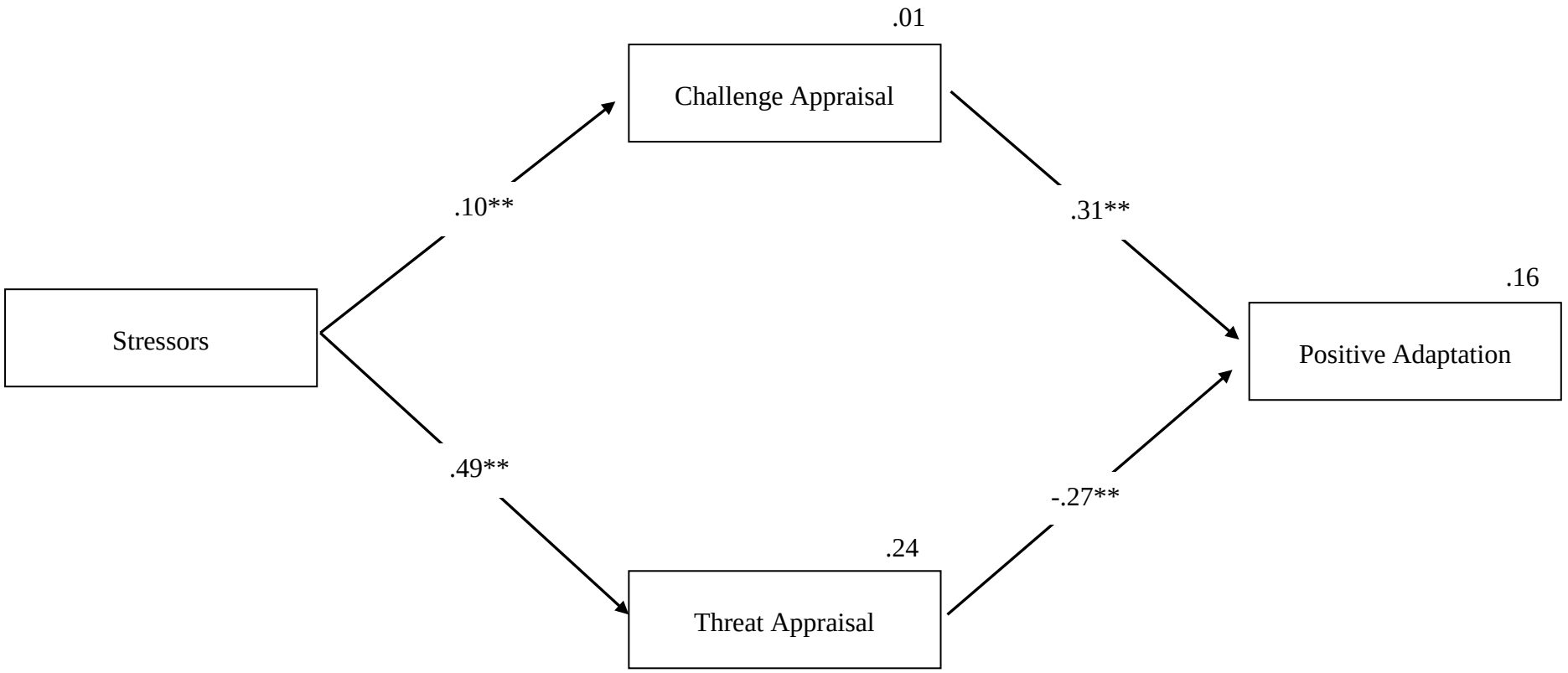

Figure 4.4. Results of path analysis for the hypothesized model (Study five). **p <.01. *Note.* Figures above the exogenous variables refer to the variance explained (R^2) by the endogenous variables. The exogenous variable residuals were uncorrelated.

χ^2 (2) = 16.00, $p < .05$; CFI = .95; IFI = .96; RMSEA = .07. Stressors positively predicted challenge appraisal (β = .10, $p < .01$) and threat appraisal (β = .49, $p < .01$). In turn, challenge appraisal predicted higher levels of positive adaptation (β = .31, $p < .01$) and threat appraisal predicted lower levels of positive adaptation (β = -.27, $p < .01$).

4.323 ***Indirect effects.*** Specific indirect effects were calculated to further test the mediating role of challenge and threat appraisal (see Table 4.3). Both indirect effects were significant: challenge appraisal (*ab* = .04; 95% CI: {.01, .06}) and threat appraisal (*ab* = -.15; 95% CI: {-.19, -.11}). Collectively, the results suggest that stressors predict higher positive adaptation via challenge appraisal whereas stressors predict lower positive adaptation via threat appraisal.

4.4 General Discussion

Chapter four investigated psychological resilience in sport performers via an examination of moderation and mediation hypotheses in two separate – yet related – studies. In Study 4, I hypothesized that the association between the stressors athletes encounter and athletes' positive adaptation would be moderated by the protective factors that athletes possess. Results supported this prediction. The interaction of protective factors with stressors predicted positive adaptation with the negative association between stressors and positive adaptation only evident among athletes who reported levels of protective factors at or below the mean. That is, the conditional direct effect was restrictive. Specifically, the conditional direct effect of stressors on positive adaptation was negative for those who reported lower levels of protective factors but was non-significant for those who reported higher levels of protective factors. In Study 5, I hypothesized that the association between the stressors athletes encounter and athletes' positive adaptation would be mediated by their cognitive appraisal processes. Results supported this prediction. Stressors positively predicted challenge appraisal and threat appraisal. In turn, challenge appraisal predicted higher levels of positive adaptation and threat appraisal predicted lower levels of positive adaptation. Additional support for the mediation model was provided by the two indirect effects with both reaching statistical significance.

4.41 Theoretical implications. These findings have important theoretical implications for psychological resilience in the sport context. Stressors predicted lower positive adaptation in athletes, suggesting that the environmental demands that sport performers encounter lead to diminished levels of sport competence and hedonic well-being when considered in isolation. When protective factors are considered in this relationship, the negative association between stressors and positive adaptation endures when protective

Table 4.3 *Specific Indirect Effects (Study Five)*

	Indirect effect	
Predictor (X) → Mediator (M) → Outcome (Y)	***ab* (SE)**	**95% CI**
Stressors→ Challenge → Positive adaptation	.04 (.02)	.01 to .06
Stressors→ Threat → Positive adaptation	-.15 (.02)	-.19 to -.11

Note. The 95% confidence intervals for the indirect effects were those derived from the *PRODCLIN* programme that produces confidence intervals on the basis of a distribution-of-the-product-method (MacKinnon, Fritz, Williams & Lockwood, 2007; Tofighi & MacKinnon, 2011).

factors are low yet the (negative) relationship becomes non-significant when athletes possess high levels of protective factors. Thus, in line with the moderating role of protective factors found in the mainstream resilience literature (cf. Baldry & Farrington, 2005; Dilorio et al., 2004; Jessor et al., 1995), this finding indicates that protective factors buffer, shield, or insulate athletes from the negative effects of stressors, which provides quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience. Interestingly, the results further showed that stressors had no (negative) effect on positive adaptation when protective factors were higher than 4.0 (out of 5). This suggests that there is a minimum level of protective factors that athletes need to possess (viz. an average level of 80%) to ensure shielding from negative consequences. Building on Fletcher and Sarkar's (2012) assertion that practitioners should intervene to achieve the best levels of, and balance between, these qualities, further research is needed to determine the optimal combination of protective factors for different sport types and skill levels (this volume, chapter two, part two). This type of research, where the relative importance of each factor is determined and compared, will be best realized with a more fine-grained assessment of resilience via the nine-factor SRS model (cf. this volume, chapter three). Furthermore, since protective factors and stressors were found to interact synergistically in predicting positive adaptation, it is important that future research on resilience examines whether a matching effect exists between protective factors and stressors; that is whether particular protective factors match best with certain stressors (cf. this volume, chapter two, part two).

In terms of the mediation results, stressors predicted higher positive adaptation via challenge appraisal whereas stressors predicted lower positive adaptation via threat appraisal. In line with Seery's (2011a) proposition, the first pathway is deemed to characterize the process of resilience. The findings indicate that challenge appraisal is an important mechanism of the resilience process (cf. Major et al., 1998; Mancini & Bonnano, 2009; Seery, 2011a), which provides additional quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience. Specifically, athletes are more likely to display higher levels of positive adaptation (i.e., competence and wellbeing) when they consider stressors to be relevant to their goals and when they evaluate the demands they are confronted with within their available resources. Challenge appraisal may predict higher levels of positive adaptation due to a variety of associated physiological responses (cf. Dienstbier, 1989). According to the biopsychosocial model of challenge and threat (BPS; Blascovich, 2008; Blascovich & Tomaka, 1996), a challenge state is characterized by increased sympathetic adreno-medullary (SAM) activity accompanied by catecholamine release

(epinephrine and norepinephrine) causing increases in heart rate (HR), ventricular contractility (VC), cardiac ouput (CO), and decreases in total peripheral resistance (TPR). These facilitative cardiovascular responses promote efficient energy use through increased blood flow to the brain and muscles, higher blood glucose levels (fuel for the nervous system) and an increase in free fatty acids that can be used by muscles as fuel (Blascovich, 2008; Blascovich & Tomaka, 1996). Thus, in the future, researchers should consider examining the role of diverse biological processes in human resilience (cf. Curtis & Cicchetti, 2003; Masten, 2007).

4.42 Practical implications. There are a number of practical implications of the findings presented. The results suggest that stressors and protective factors operate synergistically to facilitate athletes' positive adaptation. As such, individuals operating in elite sport should carefully manage athletes' immediate environment to optimize the demands they encounter in combination with identifying and monitoring the protective factors that athletes need to possess to shield them from negative consequences (viz. positive personality, motivation, confidence, focus, perceived social support). In terms of fostering these qualities, practitioners and coaches should help aspiring athletes to be proactive in their sporting development, be sensitive to different types of motivation, build confidence from multiple sources rather than focusing on one particular source, focus on what they control and on processes, and take specific steps to obtain the support that they need. To ensure protection from the negative effects of stressors, practitioners and coaches should intervene to attain the optimum level of these factors, which Study 4 indicates is at 80% of full capacity (i.e., an average of 4 out of 5 on the respective SRS items). Furthermore, the results suggest that stressors predict higher positive adaptation via challenge appraisal. Thus, educational programmes in challenge appraisal strategies, such as evaluating personal assumptions, minimizing catastrophic thinking, challenge counterproductive beliefs, and cognitive restructuring, should form a central part of resilience training (cf. Reivich, Seligman, & McBride, 2011; Schinke et al., 2004).

4.43 Limitations and future research. Several limitations of these studies deserve mention. First, the cross-sectional design precludes any inference of directionality or causality among the variables. It is important for future research to examine the proposed models using longitudinal methods to better capture the dynamic nature of resilience especially in light of Rutter (1981) observation that "if circumstances change, resilience alters (p. 317)". Indeed, the process conceptualization of resilience (see, for a review, Fletcher & Sarkar, 2013) recognizes that the effects of the protective factors will vary contextually (from

situation to situation) and temporally (throughout a situation and across an individual's lifespan). Thus, although an individual may react positively to stressors at one point in his or her life, it does not mean that the person will react in the same way to stressors at other points in his or her life (cf. Rutter, 2000).

Second, the current research did not assess athletes' meta-cognitions. When discussing their model of sport resilience, Fletcher and Sarkar (2012) asserted that whilst challenge appraisals appear to be a central feature of the resilience-performance relationship, the world's best athletes also appear to engage with higher level, meta-cognitive processes that involve reflecting on one's initial reaction to stressors (cf. Efkildes, 2008). This may be particularly salient in highly demanding performance environments, where an athlete may initially appraise a stressor in a negative manner, but further evaluate the result emotion as having the potential to facilitate performance, and thereby maintain resilience in stressful situations. Thus, it is important for future research to examine the relationships between stressors, cognitive appraisal (challenge and threat), meta-cognition, and positive adaptation.

Third, the present work used moderation and mediation analyses separately. Although this approach was useful to explore two independent research hypotheses, future research should consider using moderated mediation analyses (see Preacher et al., 2007) to test Fletcher and Sarkar's (2012) theoretical model of sport resilience in its entirety (i.e., to investigate whether protective factors shield athletes from the negative effects of stressors by influencing their challenge appraisal and meta-cognitions).

Fourth, due to the approach taken to measure resilience, it was difficult to gauge "high resilience" within the sample being examined since the reference group was the sample itself and not any larger normative group. Although participants in the present two studies appeared to display moderate-high levels of protective factors and demonstrate moderate-high levels of positive adaptation, they appeared to experience a relatively low frequency of stressors. As a result, although the sample seemed to be generally functioning well, they may not have been classified as "high resilience" if they had been compared to another group of athletes who had moderate-high levels of protective factors and demonstrated moderate-high levels of positive adaptation despite experiencing a relatively high frequency of stressors. In order to address potential interpretive ambiguities in athlete-related resilience studies that currently arise due to the lack of a quantitative benchmark, it may be beneficial to investigate and employ more sophisticated scoring systems to enable sport psychology researchers to identify an athlete's resilience profile and differentiate between different resilience profiles.

Fifth, all data was based on self-report measures, which introduces the possibility of

bias due to common method variance. This systematic source of measurement error can inflate associations among constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To address this limitation, future research should consider adopting a triangulation strategy, which incorporates multiple methods (e.g., self-reports, observations, physiological indices) into a study design so that the drawbacks of one method can be attenuated by the strengths of another (cf. this volume, chapter two, part one).

4.44 Conclusion. The two studies presented in chapter four provide quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience. Specifically, high levels of protective factors buffer, shield, or insulate athletes from the negative effects of stressors (Study 4) and stressors predict higher positive adaptation via challenge appraisal (Study 5). These findings underscore the importance of managing athletes' immediate environment to optimize the demands they encounter in combination with attaining the optimum level of protective factors that athletes need to possess to shield them from negative consequences. In addition, the results highlight the need to facilitate athletes' appraisal of stressors as opportunities for growth, development, and mastery, via challenge appraisal strategies, to enhance their perceived sport competence and hedonic well-being (i.e., positive adaptation).

Chapter Five:
Summary, Discussion, and Conclusion

This chapter is split into three parts. First, I provide a summary of chapter two (two-part literature review), three (studies one-three), and four (studies four and five). Second, I discuss the psychometric and conceptual/theoretical contributions of the thesis, its practical implications, strengths and limitations, and future research directions. Third, I offer concluding remarks on the three-year program of research regarding the assessment of psychological resilience in sport performers.

5.1 Summary

In this section, I provide a brief summary of the literature review and studies one-five.

5.11 Review: part one. Psychological resilience is important in sport because athletes must constantly withstand a wide range of pressures to attain and sustain high performance. To advance psychologists' understanding of this area, there exists an urgent need to develop a sport-specific measure of resilience. The purpose of part one was to review psychometric issues in resilience research and to discuss the implications for sport psychology. Drawing on the wider general psychology literature to inform the discussion, the narrative was divided into three main sections relating to resilience and its assessment: adversity, positive adaptation, and protective factors. The first section reviewed the different ways that adversity has been measured and considered the potential problems of using items with varying degrees of controllability and risk. The second section discussed the different approaches to assessing positive adaptation and examined the issue of circularity pervasive in resilience research. The final section explored the various issues related to the assessment of protective factors drawing directly from current measures of resilience in other psychology sub-disciplines. The commentary concluded with key recommendations for sport psychology researchers seeking to develop a measure of psychological resilience in athletes.

5.12 Review: part two. Psychological resilience is important in sport because athletes must utilize and optimize a range of mental qualities to withstand the pressures that they

experience. In part two, I discussed psychological resilience in sport performers via a review of the stressors athletes encounter and the protective factors that help them withstand these demands. It is hoped that synthesizing what is known in these areas helped researchers to gain a deeper profundity of resilience in sport, and also provided a rigorous and robust foundation for the development of a sport-specific measure of resilience. With these points in mind, I divided the narrative into two main sections. In the first section, I reviewed the different types of stressors encountered by sport performers under three main categories: competitive, organizational, and personal. Based on recent research examining psychological resilience in Olympics champions (Fletcher & Sarkar, 2012), in the second section I discussed the five main families of psychological factors (viz. positive personality, motivation, confidence, focus, perceived social support) that protect the best athletes from the potential negative effect of stressors. It is anticipated that this review will help sport psychology researchers examine the interplay between stressors and protective factors which will, in turn, focus the analytical lens on the processes underlying psychological resilience in athletes.

5.13 Studies one-three. The series of related studies reported here described the development and validation of the Sport Resilience Scale (SRS). In Study 1, an expert panel examined the content validity of an initial item pool. The resultant 105 items were analyzed with exploratory factor analysis in Study 2 with the factorial structure comprising 9 factors and 46 items. Using confirmatory factor analysis, Study 3 found support for the 9-factor structure (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances, Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being). Study 3 also provided evidence for the SRS's concurrent validity and invariance across different groups. The 36-item SRS is proposed as a valid and reliable measure of psychological resilience in sport performers.

5.14 Studies four and five. Based on Fletcher and Sarkar's (2012) grounded theory of psychological resilience, I investigated resilience in sport performers via an examination of moderation and mediation hypotheses in two separate – but related – studies. Specifically, I tested whether the association between the stressors athletes encounter and athletes' positive adaptation would be moderated by the protective factors that athletes possessed (Study 4) and whether the association between the stressors athletes encounter and athletes' positive adaptation would be mediated by their cognitive appraisal processes (Study 5). In line with my hypotheses, the two studies provided quantitative support for Fletcher and Sarkar's

(2012) theoretical model of sport resilience. Specifically, I found that stressors only predicted lower positive adaptation when protective factors were low and had no (negative) effect on positive adaptation when protective factors were high (Study 4), and stressors predicted higher positive adaptation via challenge appraisal whereas stressors predicted lower positive adaptation via threat appraisal (Study 5).

5.2 Discussion

In this section, I will discuss the psychometric contribution of the thesis in terms of its influence on the assessment of psychological resilience in sport performers, the thesis's conceptual and theoretical contribution to the sport psychology literature, practical implications of the thesis, its strengths and limitations, and future research directions.

5.21 Psychometric contribution. There is a general consensus in sport psychology that a measure of psychological resilience in athletes is needed to advance researchers' understanding of this desirable construct (cf. Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011). To the best of my knowledge, this research has developed the first valid and reliable measure of psychological resilience in sport performers, namely the Sport Resilience Scale (SRS), which provides a valuable psychometric contribution to the (sport) psychology literature.

The SRS is the only resilience measure to date that assesses all three components of psychological resilience (viz. stressors, protective factors, positive adaptation). Most of the current measures of resilience in the psychology literature focus on the sole assessment of protective factors (i.e., resilient qualities) that are implicitly assumed to be associated with positive adaptation in the face of adversity (Ahern et al., 2006; Windle et al., 2011). In their review of resilience measurement scales, Windle et al. (2011) observed that:

> All but one of the [fifteen] identified resilience scales reflects the availability of assets and resources that facilitate resilience, and as such may be more useful for measuring the process leading to a resilient outcome, or for . . . researchers who are interested in ascertaining the presence or absence of these resources (p. 14).

Importantly, assessing protective factors on its own provides a partial and inaccurate representation of psychological resilience. In relation to the CD-RISC (Campbell-Sills & Stein, 2007; Connor & Davidson, 2003), a popular measure of resilient qualities that has been applied in the sport context, Gucciardi et al. (2011) noted that "this [scale] diverts the user's attention from examining the true nature of resilience (i.e., positive adaptation in the face of

adversity) (p. 430)". This assertion was based on the work of Luthar and Zelazo (2003) who stated that resilience itself is never directly measured (see also Luthar, 2006; Masten & Obradovic, 2006) but is inferred based on the assessment of two distinct dimensions: adversity (or stressors) and positive adaptation. Moreover, examining the interplay between stressors and protective factors is an important aspect of resilience research since it focusses the analytical lens on the processes underlying adaptation or vulnerability (Luthar & Zelazo, 2003; Naglieri & LeBuffe, 2005; Rutter, 2006; Windle, 2011). Indeed, Rutter (2006) argued that "resilience is an interactive concept that can only be studied if there is a thorough measurement of risk and protective factors" (p. 3). Taking these points in mind, the SRS separately assessed and analyzed stressors, protective factors, and positive adaptation from the outset, based on this tripartite conceptualization, thus realizing a complete and accurate representation of psychological resilience.

Another important psychometric contribution of the SRS is that it can be employed at both a broad or fine-grained level depending on the nature of the research. A hierarchical structure in which the nine first-order factors are represented by three higher-order factors: Stressors (Performance and Self Presentation Issues, Coach Issues, and Personal Commitments and Circumstances), Protective Factors (Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, and Proactive Personality), and Positive Adaptation (Perceived Sport Competence and Hedonic Well-Being) can be adopted by researchers interested in a general measure of psychological resilience (e.g., when measuring resilience in complex structural equation modelling). Indeed, this was the approach taken in chapter four (studies 4 and 5 respectively). However, for those examining the relationships between specific resilience-related factors and other concepts, the nine-factor model can be adopted to provide a more in-depth assessment.

5.211 ***The assessment of protective factors.*** The SRS provides a valuable psychometric contribution to the (sport) psychology literature by addressing four main measurement issues relating to the assessment of protective factors (cf. this volume, chapter two, part one). Drawing directly from current resilience scales in other psychology disciplines, this sub-section will explain how the SRS addresses these issues and contributes to measurement in this area.

First, the SRS assesses a range of protective factors spanning personal qualities to one's potential access to social support. This is in comparison to the majority of measures that focus on protective factors at the level of the individual only (Ahern et al., 2006; Naglieri & LeBuffe, 2005; Windle et al., 2011). For example, the CD-RISC (Campbell-Sills & Stein,

2007; Connor & Davidson, 2003) solely tap into personal factors of resilience including control, commitment, challenge, adaptability, and problem solving. Similarly, the Resilience Scale (RS; Wagnild & Young, 1993) assesses five resilient characteristics exclusively based at the individual level: equanimity, perseverance, self-reliance, meaningfulness, and existential aloneness.

Second, the approach to item development was sufficiently justified in this research and vast empirical knowledge in key resilience-related areas was exploited. To illustrate, Study 1 noted that a multi-method approach was adopted to inform the development of the SRS (cf. Hagger & Chatzisarantis, 2011). Specifically, the SRS was derived from a grounded theory of psychological resilience in Olympic champions (Fletcher & Sarkar, 2012), and items were generated from narrative reviews of psychological resilience in the context of sport performance (this volume, chapter two, parts one & two). This rigorous foundation for the SRS is in contrast to some other measures of resilience which have used a disputable evidence base for the selection of items. For example, although the content of the CD-RISC was drawn from a number of different peer-reviewed sources (e.g., Kobasa, 1979; Lyons, 1991; Rutter, 1985), Connor and Davidson (2003) also included putative resilience factors – with questionable theoretical basis – based on the memoirs of Sir Edward Shackleton's expedition in the Antarctic in 1912 (Alexander, 1998). Furthermore, the Brief Resilience Scale (BRS; Smith et al., 2008) was solely derived from a dictionary definition of resilience (the ability to "bounce back" or recover from stress) favored by the lead author.

Third, the SRS assesses sport-specific protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, and Proactive Personality). This is important since resilient qualities assessed in current measures are specific to the context in which they arise and cannot be easily generalized to other populations (Davydov et al., 2010; Ungar et al., 2008). For example, the Suicide Resilience Inventory-25 (SRI-25; Osman et al., 2004) assess characteristics that dissuade individuals from considering suicide as an option. Moreover, the Trauma Resilience Scale (TRS; Madsen & Abell, 2010) specifically assesses protective factors associated with positive adaptation following violence. Indeed, all the resilience inventories to date have been developed for use in non-sport contexts, such as psychiatric patients (see Connor & Davidson, 2003; Madsen & Abell, 2010; Osman et al., 2004). This is particularly problematic for sport psychology researchers since constructs that are meaningful to non-sport participants are unlikely to be entirely relevant to athletic performers (cf. Fletcher & Sarkar, 2012). The importance of the context was recently emphasized by Gucciardi et al. (2011) who argued that "important protective (e.g., teammate

support) and vulnerability (e.g., rigorous training schedules) factors are likely not to be adequately captured when using [current resilience] measures . . . that were developed with other [than sport] populations in mind" (p. 431). The SRS addresses this psychometric issue by exploiting the empirical sport-specific knowledge base in the pivotal resilience-related areas of protective factors and stressors (cf. this volume, chapter two, part two).

Fourth, the SRS doesn't conflate psychological resilience with related terms and, by basing the scale on resilience concepts and theory (Fletcher & Sarkar, 2012; 2013; this volume, chapter two, parts one & two) subsequently ensures that it provides an accurate representation of resilience. In Study 1, for example, independent panels of experts helped to establish the content validity of the SRS with one expert panel member noting that the SRS was "an attractive sounding scale and clearly adds something different to existing inventories and helps to make resilience distinct from other overlapping areas". This is contrast to a number of existing inventories that measure phenomena that are related to resilience but are conceptually distinct from the construct. For example, the BRS provides a measure of recovery from stress and the CD-RISC was designed to assess an individual's stress-coping ability. Whereas recovery and coping are often discussed in relation to resilience, and sometimes used interchangeably with the term, there is a growing body of evidence to suggest that they should be conceived as conceptually distinct from resilience (see, for a review, Fletcher & Sarkar, 2013). To provide further illustrations, the Dispositional Resilience Scale (DRS; Bartone et al., 1989) presents a measure of hardiness and the Ego-Resiliency Scale (ER89, Block & Kremen, 1996) was developed to assess ego-resiliency. Although both constructs share a number of similarities with the attributes of resilience, they do not contain all of the relevant features (Windle, 2011). Grounded in resilience definitions, concepts, and theory (Fletcher & Sarkar, 2012; 2013), the SRS distinguishes resilience from a number of related terms to ensure that it does not divert researchers' attention from examining the true nature of resilience. To sum, the SRS provides a comprehensive and accurate measure of psychological resilience in sport performers and offers a number of valuable psychometric contributions to the (sport) psychology literature.

5.22 Conceptual and theoretical contribution. In addition to contributing to measurement in this area, this thesis provides a number of important conceptual and theoretical contributions to the sport psychology literature. In terms of its conceptual contribution, the two reviews of resilience in sport (viz. this volume, chapter two, parts one & two) initially operationalized the concepts of stressors, protective factors, and positive adaptation to provide the foundation for a comprehensive and accurate sport-specific measure

of resilience. Subsequently, during the development and validation of the SRS (studies one-three), the research (viz. Study 3) found support for the concurrent validity of the resilience measure by reporting significant correlations between stressors (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances) and perceived stress, sport-specific protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality) and general resilient qualities, and positive adaptation (viz. Perceived Sport Competence, Hedonic Well-Being) and thriving. These findings suggest that the SRS measures what it purports to be measuring based on the operational definitions of stressors, protective factors, and positive adaptation.

Two particular conceptual relationships are worth highlighting. First, in Study 3, the stressors measured in the SRS were perceived to be stressful with Performance and Self Presentation Issues, Coach Issues, and Personal Commitments and Circumstances, all significantly correlated with perceived stress (r = .21 to .46, p < .01). This finding provides an important conceptual contribution to the sport psychology literature since it provides empirical evidence of the associations between scores on a stressor measure and other conceptually related indices ensuring that the measure of stressors does in fact represent its intended concept (this volume, chapter two, part one). According to Lazarus and Folkman (1984), stressful appraisals occur when a situation is evaluated as being significant to an individual's well-being. The stressors assessed in the SRS appear to be linked to such a reaction. If an individual perceives an encounter to be significant, and thus stressful, there are a number of possible appraisals including challenge and threat (Lazarus & Folkman, 1984). Interestingly, qualitative studies have found that (organizational) stressors are predominantly appraised as threatening (see, e.g., Hanton, Wagstaff, & Fletcher, 2012; Didymus & Fletcher, 2012; Neil et al., 2011). Study 5 provides quantitative support for this observation across a variety of (competitive, organizational, and personal) stressors. Specifically, although stressors were found to positively predict both challenge and threat appraisal, there was a stronger prediction with threat appraisal (β = .49, p < .01) than challenge appraisal (β = .10, p < .01). Interestingly, in terms of resilience, although stressors predicted threat appraisal more strongly than challenge appraisal, challenge appraisal predicted higher levels of positive adaptation and threat appraisal predicted lower levels of positive adaptation. This finding will be discussed later in this section.

Second, in Study 3, positive adaptation was related to thriving with Perceived Sport Competence significantly correlated with both the thriving subscales: learning (r = .42, p < .01) and vitality (r = .46, p < .01), and Hedonic Well-Being also significantly correlated with

both learning (r = .35, p < .01) and vitality (r = .49, p < .01). Although previous work has suggested a conceptual link between positive adaptation, resilience, and thriving (see, e.g., Carver, 1998; Sarkar & Fletcher, 2014a; Sutcliffe & Vogus, 2003; Spreitzer, Sutcliffe, Dutton, Sonenshein, & Grant, 2005), this research is the first to provide quantitative support for this association. In one of the first papers to discuss the potential conceptual links and distinctions between resilience and thriving, Carver (1998) noted that resilience is similar to thriving in that they both reflect a capacity for positive adaptation (see also Sutcliffe & Vogus, 2003). In differentiating between the concepts, he argued that, in contrast to resilience, thriving is not contingent on the existence of a negative life event or chronic distress. Similarly, when distinguishing between resilience and thriving, Spreitzer et al. (2005) observed that the conceptualization of resilience typically encompasses adversity, whereas people can exhibit thriving with or without adversity. This research provides empirical evidence of the conceptual link between positive adaptation and thriving. Notwithstanding this contribution to the literature, "applying the resilience framework implies attention to positive outcomes in the presence of adversity [or stressors] rather than positive adaptation in general" (Luthar & Cicchetti, 2000, p. 863) and thus, conceptually, it is important that the SRS assesses and validates items related to stressors *and* positive adaptation.

In terms of the thesis's theoretical contribution, Studies 4 and 5 provide quantitative support for Fletcher and Sarkar's (2012) grounded theory of psychological resilience. The theory indicates that numerous psychological factors (relating to a positive personality, motivation, confidence, focus, and perceived social support) protect the world's best athletes from the potential negative effect of stressors by influencing their challenge appraisal and meta-cognitions. Since the grounded theory is relatively new and currently untested, the present research determined the utility of the theory using the model to generate research questions and hypotheses about resilience in sport (cf. this volume, chapter two, part two). Specifically, chapter four (studies 4 and 5) provides a valuable theoretical contribution to the sport psychology literature by addressing two important resilience hypotheses: moderation by protective factors (Study 4) and mediation by cognitive appraisal (Study 5).

With regards to the moderation hypothesis, Rutter's (1987) conceptualization suggests a differential or variable impact of protection on the relation between risk and behavioral outcomes such that its impact is most evident when protection is high, and its influence is more limited when protection is low. In line with this proposition, various studies within the general psychology literature have found that protective factors moderate the relationship

between risk and behavioral outcomes (see, e.g., Baldry & Farrington, 2005; Dilorio et al., 2004; Jessor et al., 1995; Pinquart, 2009). Based on these findings, it was hypothesized that the association between the stressors athletes encounter and athletes' positive adaptation will be moderated by the protective factors that athletes possess (see Figure 4.1). Study 4 found that stressors only predicted lower positive adaptation when protective factors were low and had no (negative) effect on positive adaptation when protective factors were high. Interestingly, the results further showed that the negative relationship between stressors and positive adaptation became non-significant when protective factors were higher than 4.0 (out of 5). In terms of the study's theoretical contribution to the literature, these findings not only indicate that protective factors buffer athletes from the negative effects of stressors; they also suggest, building on Fletcher and Sarkar's (2012) assertion that practitioners should intervene to achieve the best levels of, and balance between, these qualities, that there is a minimum level of protective factors that athletes need to possess (viz. an average level of 80%) to ensure shielding from negative consequences.

With regards to the mediation hypothesis, Mancini and Bonnano (2009)'s hypothesized model of resilience suggests that appraisal processes are an important mechanism of resilience specifically playing a critical mediating role in promoting positive adaptation. Furthermore, Seery (2011) proposed, in relation to the potential stress of motivated performance situations, that evaluations of challenge typically reflect resilience and evaluations of threat typically reflect vulnerability. In terms of empirical evidence, within the general psychology literature, resilience research findings have revealed the mediating role of cognitive appraisal (see, e.g., Major et al., 1998) with challenge appraisal predicting higher positive adaptation and threat appraisal predicting lower positive adaptation (see, e.g., Bonnano et al., 2012; Riolli et al., 2010; Schubroeck et al., 2011; Tugade & Fredickson, 2004). In the context of sport, Study 5 found that stressors predicted higher positive adaptation via challenge appraisal whereas stressors predicted lower positive adaptation via threat appraisal. In line with Seery's (2011) proposition, the first pathway is deemed to characterize the process of resilience. In terms of the study's specific theoretical contribution to the literature, the results provide empirical evidence for the notion that challenge appraisal is an important mechanism of the resilience process (cf. Major et al., 1998; Mancini & Bonnano, 2009; Seery, 2011). Specifically, athletes are more likely to display higher levels of positive adaptation (i.e., competence and wellbeing) when they consider stressors to be relevant to their goals and when they evaluate the demands they are confronted with within their available resources.

To sum, using the SRS components (viz. stressors, protective factors, positive adaptation) developed and validated in studies One-Three, studies 4 and 5 provided quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience. Specifically, high levels of protective factors buffer, shield, or insulate athletes from the negative effects of stressors (Study 4) and stressors predict higher positive adaptation via challenge appraisal (Study 5). Collectively, this work provides a number of valuable psychometric, conceptual, and theoretical contributions to the sport psychology literature.

5.23 Practical implications. Drawing on the thesis's findings and the existing body of knowledge in the area of psychological resilience, in this section, I present an evidence-based approach to the development of psychological resilience for sustained success.

Whilst operating in complex environments, elite athletes continually face situations that require actions to achieve valued goals. These "motivated performance situations" (Seery, 2011a, p. 2011) are potentially stressful in competitive sport because they are ubiquitous, often have meaningful consequences at stake, and are marked by uncertain chances for sustained success. Despite the traditional, intuitively appealing view that these environmental characteristics create a negative stressful experience for sport performers, this is not necessarily the case. Situations that seem objectively similar can be experienced by different individuals in a range of ways, from invigorating excitement to overwhelming fear. Consequently, some athletes are able to withstand the pressures associated with high performance sport and attain peak performances whereas others succumb to the demands and continually under-perform. It is the study of psychological resilience that seeks to understand this fascinating dichotomy.

A burgeoning body of empirical evidence points to the importance of mental fortitude for sustained success in sport and other high performance domains (see, e.g., Fletcher & Sarkar, 2012; Morgan, Fletcher, & Sarkar, 2013; 2015; Sarkar & Fletcher, 2014a). To advance the application of this resilience knowledge for sport practitioners, Fletcher and Sarkar (2012) asserted that "systematic resilience research programs . . . will provide the most rigorous and robust platform from which to develop resilience training in sport" (p. 676). Drawing on the thesis's findings and the existing body of knowledge in this area, this part of chapter five presents an evidence-based approach to the development of psychological resilience for sustained success. To this end, the narrative is divided into three main sections. The first describes the construct of psychological resilience and explains what it is and isn't. The second section outlines and discusses a mental fortitude training program for aspiring elite athletes. The final section provides some thoughts for practitioners when implementing

this program in practice.

5.231 ***What is psychological resilience?*** Put simply, psychological resilience refers to the ability of individuals to utilize and optimize a constellation of personal qualities to withstand the pressures they experience in their lives (cf. Fletcher & Sarkar, 2012; 2013). Resilience is characterized by relatively stable, healthy levels of functioning and performance and, thus, individuals who exhibit resilience are able to proceed with their lives, following a potentially stressful event, with temporary (short-term) minor fluctuations in their daily functioning and performance (cf. Bonanno, 2004). On this basis, resilience training is not aimed at people who have more notable, longer-lasting disruptions to functioning and performance (cf. Reeves et al., 2011) or those who have significant depletions in their functioning and performance (cf. Shearer et al., 2011). It is also worth noting that resilience is a process that results from the interaction of an individual and his or her environment (Egeland et al., 1993); it is, therefore, not a fixed trait and there is a growing body of evidence to suggest that resilience can be taught and developed (see, e.g., Reivich et al., 2011; Schinke et al., 2004). Importantly, in the context of operating in a high performance environment, developing resilience should be seen as a preventative and proactive approach to managing stress. In the business domain, for example, Hamel and Valikangas (2003) asserted that "resilience is not about responding to a one-time crisis. It's not about rebounding from a setback. It's about having the capacity to change before the case for change becomes desperately obvious" (pp. 53-54).

In terms of what resilience isn't, resilience is not a rare or special quality that is found only in certain extraordinary people. Rather, resilience comes from "the everyday magic of ordinary, normative human resources" (Masten, 2001, p. 235) and all human beings have the capacity to develop resilience. Furthermore, "one of the misconceptions about resilience . . . is the idea that [it] is more or less found exclusively within the person" (Bonanno, 2006, p. 33). Resilience is not developed in social isolation and this notion is support by research in elite sport (see, e.g., Galli & Vealey, 2008; Fletcher & Sarkar, 2012; Morgan et al., 2013; 2015). In addition, resilience can often be misconstrued as a form of stoicism, a noble forbearance in the face of pain and suffering. However, resilience is not characterized by the absence of emotion nor does it concern the suppression of negative emotions.

5.232 ***A mental fortitude training program for aspiring elite athletes.*** In Fletcher and Sarkar's (2012) study examining psychological resilience in Olympic champions, numerous psychological factors were found to protect the world's best athletes from the potential negative effect of stressors by influencing their challenge appraisal and meta-cognitions.

These processes promoted facilitative responses that preceded optimal sport performance. Interestingly, the participants encountered a wide variety of different stressors in their sporting environment, including highly demanding adversities, which they considered were essential for winning their gold medals (see Sarkar et al., in press). Based on this recent research and the thesis's findings, this section will present an evidence-based approach to the development of psychological resilience for sustained success. The mental fortitude training program covers three main areas: personal qualities, challenge mindset, and facilitative environment (see Figure 5.1). From an intervention perspective, it is important to note that these three areas are not mutually exclusive and should be addressed collectively to fully realize its benefits. Moreover, a comprehensive mental fortitude training program needs to cover *all* three areas to develop resilience in athletes completely.

5.2321 *Personal qualities.* Personal qualities refer to the psychological factors that protect an individual from negative consequences. In Fletcher and Sarkar's (2012) study, Olympic champions were found to utilize and optimize a constellation of attributes to withstand the stressors they encountered. More specifically, resilience was characterized by five main personal qualities: a positive personality, motivation, confidence, focus, and perceived social support (Fletcher & Sarkar, 2012). Based on a review of these psychological phenomena in sport (see this volume, chapter two, part two), I have provided some top tips in Table 5.1 for aspiring elite athletes to foster these resilience-related factors (cf. Sarkar & Fletcher, 2012).

Via the SRS, sport psychologists and coaches should identify and monitor these psychological characteristics that an athlete needs to develop to exhibit resilience. In addition, since the best combination of personal qualities will vary for different sport types and skill levels, individuals operating in elite sport should carefully intervene to attain the optimum levels of, and balance between, these factors (Fletcher & Sarkar, 2012; this volume, chapter two, part two). Furthermore, based on the two overarching messages of resilience and thriving in high achievers across sport and other demanding performance domains (Sarkar & Fletcher, 2014a), practitioners should empower athletes to take personal responsibility for enhancing their personal qualities in potentially stressful situations, and cultivate a commitment to professional development and mastery to better enable aspiring high achievers to make deliberate and decisive decisions in their particular performance context.

5.2322 *Challenge mindset.* A challenge mindset is characterized by a positive evaluation of pressure. It occurs when an event or situation is considered to be relevant to one's goals and when an individual evaluates the demands he or she is confronted with as

Figure 5.1. Mental fortitude framework for developing athletes' resilience.

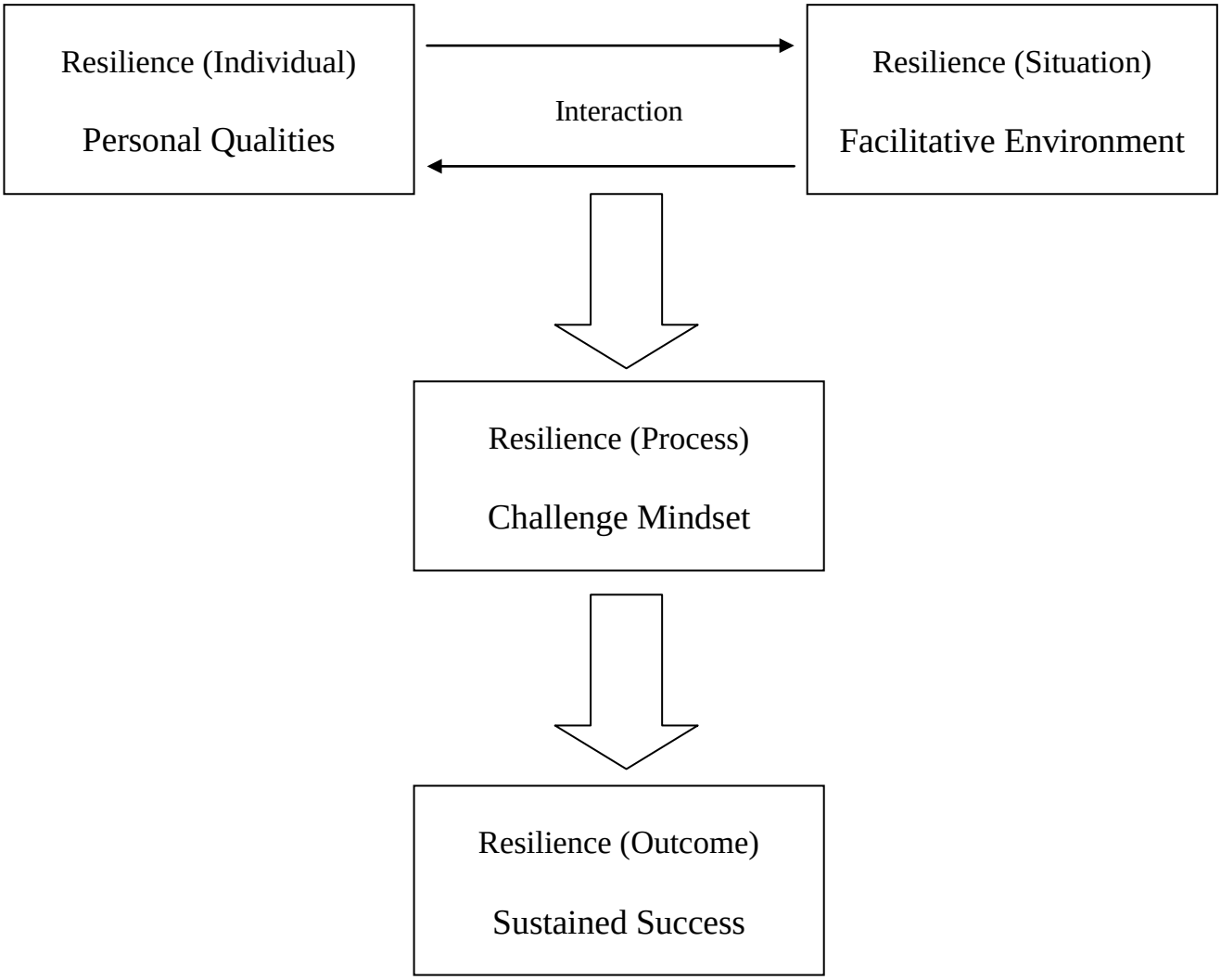

Table 5.1 *Top Tips for Aspiring Elite Athletes to Foster Personal Qualities*

Five main personal qualities	**Top tips**
Develop a positive personality	• Have high personal standards and strive for excellence. • Explain negative events with unstable, contextual, and external causes. • Demonstrate the desire to succeed in interpersonal situations. • Display dedication in the pursuit of goals and envisage alternative routes in the face of goal blockage. • Proactively identity opportunities in the environment.
Optimise motivation	• It is not the "level" but rather the "nature" of motivation that is more important in driving resilience. • Be driven by the desire for success (i.e., approach motivation), not the fear of failure (i.e., avoidance motivation). • The more externally motivated you are, the more pressure and potential stress there is to perform to others' high expectations. • Don't stray too far from being internally motivated and self-determining (e.g., consider the decisions you make as active choices rather than sacrifices).
Strengthen confidence	• Focus on your recent performance accomplishments. • Mentally rehearse how you will deal with pressure situations. • Change negative self-talk by using positive counter-statements. • Interpret intense mental and physical responses to pressure as helping you to prepare.
Maintain focus	• Focus on what you can control, on processes, the present, positives, and staying composed under pressure. • Set aside time to deal with the other things going on in your life. • Recharge your focus by planning restoration time. • Get back on track following failures and successes.
Recognise the availability of social support	• Take specific steps to obtain the support that you need. • Identify the networks that provide you with different forms of support (i.e., emotional, esteem, informational and tangible support). • Seek suitable mentors. • Build cohesive teams and hire competent staff.

within his or her available resources (cf. Lazarus & Folkman, 1984). In Fletcher and Sarkar's (2012) study with Olympic champions, the participants tended to perceive stressors as opportunities for growth, development, and mastery. More specifically, they believed that stressors provided them with opportunities to develop "a psychological and competitive edge" over their peers and opposition. The world's best athletes also appeared to engage with higher-level, meta- cognitive processes that involved reflecting positively on one's initial reaction to stressors. These findings led Fletcher and Sarkar (2012) to assert that "educational programs in challenge appraisal and meta-reflective strategies . . . should form a central part of resilience training" (p.676). Taking a cognitive-behavioural approach to developing resilience (cf. Neenan, 2009), and based on research in sport (Schinke & Jerome, 2002; Schinke et al., 2004) and the military (Reivich et al., 2011), I outline seven main skills to develop a challenge mindset in aspiring elite athletes: learning your ABCs, avoiding thinking traps, detecting icebergs (i.e., deeply held beliefs), challenging beliefs (via problem solving), putting it in perspective (minimizing catastrophic thinking), calming and focusing (via energy management), and fighting back against counterproductive thoughts in real time (see Table 5.2). In the narrative itself, I will focus on the three main skills that provide the foundation for developing a challenge mindset: ABCs, avoiding thinking traps, and minimizing catastrophic thinking.

Based on the original work of Albert Ellis (1962), learning about ABCs is about helping individuals to identify thoughts that are triggered by activating events and to identify reactions that are driven by those thoughts. In this unit, practitioners would guide athletes on how to recognize an activating event (A), their beliefs (B) about the activating event, and the emotional and behavioural consequences (C) of those thoughts. Athletes would work through a series of professional (e.g., "You get deselected from an upcoming competition") and personal (e.g., "You return home after a long tour and your partner breaks up with you") activating events with the goal of being able to separate the activating events from what the athletes say to themselves in the heat of the moment and the emotions their thoughts generate. Using practical exercises, sport psychology consultants could help athletes to look for thought patterns that are driving adaptive outcomes and patterns that are driving counterproductive outcomes. The goal at the end of this unit is to have athletes distinguish activating events, thoughts, and consequences.

Based on the original work of Aaron Beck (Beck, 1976), avoiding thinking traps is about making individuals aware about how their thinking habits can trap them into negative and unhelpful thoughts. Athletes would learn about the eight most common thinking traps

Table 5.2 *Seven Main Skills to Develop a Challenge Mindset in Aspiring Elite Athletes*

Skill	**Skill Details**
Learning your ABCs	• Identify activating events (A) that test your resilience. • Consider your in-the-moment beliefs (B) as a result of these incidents. • Recognize the emotional and behavioral consequences (C) of such thoughts.
Avoiding thinking traps	• Understand the eight most common thinking traps (jumping to conclusions, tunnel vision, magnifying or minimizing, personalizing, externalizing, overgeneralizing, mind reading, and emotional reasoning). • Explore how patterns of thinking can help or hinder resilience. • Use probing questions to climb out of the traps you fall into.
Detecting icebergs (i.e., deeply held beliefs)	• Identify deeply held beliefs (e.g., "Asking for help is a sign of weakness"). • Ask a series of questions to determine (a) if the iceberg continues to be meaningful, (b) if the iceberg is accurate in the given situation, (c) if the iceberg is overly rigid, and (d) if the iceberg is useful. • Explore how these icebergs contribute to, or undermine, resilience.
Challenging beliefs (via problem solving)	• ABC an adversity. • Pie chart casual beliefs (why beliefs) or explanations for the problem. • Identify your explanatory style. • Be more flexible by generating some alternative why beliefs. • Be more accurate by searching for evidence both for and against each belief. • Construct a new pie chat for your adversity. • Generate new solutions.
Putting it in perspective (minimizing catastrophic thinking)	• Identify the potential decline from current situation to worst-case beliefs. • Estimate the probabilities of your worst-case beliefs. • Generate best-case alternatives. • Identify most likely outcomes. • Problem solve the most likely implication.
Calming and focusing (via energy management)	• Experiment with energy management techniques such as meditation, controlled breathing, progressive muscle relaxation, and positive imagery. • Explore rejuvenation strategies such as prayer, exercise, sleep, and laughter.
Fighting back against counterproductive thoughts in real time	• Explore three strategies that can be used to immediately challenge negative thoughts: evidence, optimism, and perspective. • Identify three common errors that are made when trying to challenge negative thoughts: minimizing, rationalizing, and denying. • Consider strategies for correcting these errors in the moment: one time/one thing, owning the situation, and taking appropriate responsibility.

(see Table 5.2) and explore the emotional and behavioural consequences each thinking style drives. Practitioners are advised to present a series of appropriate, sport-related case studies in this unit to illustrate how patterns of thinking can help or hinder resilience. After athletes review common thinking traps, practitioners should present them with a series of questions that they can ask themselves in order to identify critical information that they may have missed because of a thinking trap. For example, the question "What is the big picture?" may be used to help an athlete who is prone to tunnel vision. To further illustrate, the question "Were there any good things that happened?" may be used to help an athlete who tends to magnify the negatives of a situation. By the end of learning this skill, athletes will have identified their specific thinking patters and practiced using specific questions to broaden the information to which they attend.

Catastrophic thinking refers to rumination about irrational worst-case outcomes. Schinke and Jerome (2002) provided a sport-specific illustration in which a national team marathon runner had an escalating concern of being elbowed violently during the latter part of important races. Although the concern was realistic, it had increased to a debilitative level. The athlete anticipated that she would be overpowered by her opponents at a crucial moment in a forthcoming race, and that her performance would end in personal injury, elimination, and de-selection. In the U.S. Army Master Resilience Training (MRT) course (see Reivich et al., 2011), a video clip is used in which a soldier is unable to contact his wife via email. From this video clip, catastrophic thinking ("She left me") is highlighted and the soldiers explore the effects of this style of thinking on energy, focus, problem solving, and emotions. After a relevant video clip is shown and appropriately debriefed, in an athletic context, sport psychology consultants should teach a three-step model to minimize catastrophic thinking in athletes: (a) capturing catastrophic thinking; (b) generating a best-case possibility (for the marathon runner, this would be a race without physical confrontation); and (c) identifying most likely outcomes, that is, a situation or circumstance between the most positive and negative of outcomes (for the marathon runner, this could include the possibility of physical exchanges without injury). After likely outcomes are identified, practitioners are advised to teach athletes to develop plans for withstanding the pressures they are experiencing. By the end of this unit, athletes should be able to distinguish contingency planning (effective) from catastrophizing (ineffective) and learn to use the three-step process in order to identify likely outcomes and appropriate plans for them.

5.2323 *Facilitative environment.* In the present discussion, a facilitative environment refers to a setting or context that fosters the development of psychological resilience. While

the two previous sections have focused specifically on an individual's resources and thoughts, this section explores the environment in which an athlete operates in. As alluded to earlier in this part of chapter five, psychological resilience is important to consider in the context of person-environment interactions (cf. Egeland et al., 1993). Indeed, in Fletcher and Sarkar's (2012) study of resilience in Olympic champions, the authors proposed that research and practice in this area should pay careful attention to the matching of psychological factors with the environmental demands. They subsequently asserted that it is vital that athletes' immediate environment is sensibly overseen to optimize the stressors they experience in order to promote and nurture the enhancement of psychological factors that will protect them from undesirable outcomes.

Although, traditionally, there has been a tendency to assume that negative situations and circumstances impede resilience (cf. Fletcher & Sarkar, 2013), Seery et al. (2010) found that people with a history of some lifetime adversity reported better health and well-being outcomes than people with no history of adversity (see also Seery, 2011b; Seery, Leo, Lupien, Kondrak, & Almonte, 2013). Drawing from theories of stress inoculation (Meichenbaum, 1985), it has been suggested that exposure to environmental demands in moderation can mobilize previously untapped resources, help engage social support networks, and create a sense of mastery for future stressors (cf. Sarkar & Fletcher, 2014a). Thus, where possible, practitioners and coaches should encourage athletes to actively engage with challenging situations that present opportunities for them to raise their performance level and, in doing so, expose athletes to appropriate and progressively demanding stressors (cf. Sarkar et al., in press). During exposure to a realistic critical incident simulation, for example, a police-specific training program enhanced stressor-specific adaptive responses, increased controllability, and simultaneously improved job performance (see Arnetz et al., 2009).

To optimize resilience training initiatives, organizations should provide community-based opportunities that give individuals access to both environmental and personal resources that develop their resilience in meaningful ways (cf. Ungar, 2008). In the context of elite sport, athletes should be offered various formal and informal psychosocial training and developmental experiences. Examples include personal mentoring from the world's best athletes, expert coaching provision, performance enhancement training, and access to counselling during particularly demanding periods. In view of these propositions, I suggest that high levels of both challenge *and* support are required to create a facilitative environment where success is inevitable and sustainable (cf. Jones, Gittins, & Hardy, 2009). To illustrate, a sport environment in which levels of challenge are high in comparison to levels of support

is likely to be stressful and possibly lead to athlete burnout. In contrast, high levels of support with low levels of challenge may perhaps be an enjoyable and motivating place to operate, but may be too comfortable for high levels of resilience and performance to occur.

5.233 ***Developing psychological resilience: From theory to practice.*** In this final section, I provide some thoughts for practitioners when implementing this evidence-based resilience program in practice. First, it is worth noting that there may be some reluctance and resistance to holding open and frank discussions about resilience since talking about the topic may be seen as a sign of weakness or a subject to be avoided. In time, consultants should aim to put discussions about resilience on the agenda by emphasizing that resilience is a strength that can be utilized to help people withstand – and even thrive on – pressure. Almost everyone can benefit from increasing resilience and, because this is not always well understood, just raising the issue and having an open discussion can have beneficial effects. A useful way into discussing the topic in the sport context is to invite athletes and coaches to think of the benefits that might come to them if they could enhance their resilience both in their sport environment and at home. Constructive discussions can then take place about changes that would help them to withstand pressure and achieve sustained success under demanding conditions without becoming stressed or burnt out.

Second, when implementing interventions within a sport organization, consultants should pay careful attention to the constantly unfolding organizational politics within contemporary sport (cf. Ravizza, 1988). Of central importance is identifying the key decision-makers within an organization and the personnel (e.g., performance directors) whose input will likely influence any potential interventions. It is also worth noting who within the organization is receptive to psychological support (Hardy et al., 1996). The extent of commitment from all layers of the organization – the executive board, managerial committees, technical and support staff, coaches, athletes – to protecting individuals from the negative consequences of stress is critical to the success of resilience interventions. Indeed, this was the attitude taken by the U.S. Army who developed the Comprehensive Soldier Fitness (CSF) program (where MRT is one of the foundational pillars), an effective strategic initiative to develop resilience in soldiers, family members, and Army civilians. The program received total and unequivocal commitment from the top of the organization and full support from Department of Defence leaders, members of Congress, and a budget to match. Thus, in effect, the best way to capitalize on the investment of resources in resilience training and development is to make it a critical part of a culture change strategy over a period of time. Indeed, General Casey – the person responsible for implementing CSF – stated that “like our

physical fitness, I believe that psychological resilience development can become not just something we in the Army "do", but rather a critical component of our culture that will be integrated throughout our community to develop better soldiers" (Casey, 2011, p. 2).

Third, there are various issues to consider when designing resilience interventions. As previously mentioned, to optimally develop resilience in athletes, a comprehensive mental fortitude training program needs to cover all three areas (viz. personal qualities, challenge mindset, facilitative environment) rather than focus on one particular element (e.g., challenge mindset). In addition, to fully realize the program's benefits, all areas of the program should be addressed collectively rather than in isolation of one another. Notwithstanding these recommendations, it is important that mental fortitude training is not a "one size fits all" program since all topics will not be equally relevant. Rather, training should be customized to meet specific needs and requirements and, ideally, adapted to each individual's psychological resilience level. From a delivery perspective, training alone will unlikely bring about sustainable and lasting changes in resilience. There must be opportunity, encouragement, and support for experimentation and behaviour change over protracted periods. Lastly, from a measurement perspective, sport psychology researchers and practitioners need to consider three pivotal components – adversity (or stressors), protective factors (i.e., personal qualities), and positive adaptation (i.e., indicators of performance and well-being) – to realize a complete and accurate assessment of psychological resilience (cf. this volume, chapter two, part one).

5.24 Strengths and limitations. In this section, I will discuss some of the strengths and limitations of the thesis. In my view, the major strengths of this thesis relate to the foundation of the sport-specific measure of resilience, the comprehensive nature of the SRS, and the quantitative testing of a relatively new theoretical model of sport resilience. First, the reviews (part one and two) provided a rigorous and robust foundation for the development of the SRS. Gucciardi et al. (2011) noted that there is a need for sport psychology researchers to provide a comprehensive review of methodological issues pertaining to the measurement of resilience and how it can be applied to sport before scholars can develop a sport-specific measure of resilience. This recommendation was addressed in chapter two (part one). The psychometric lessons learned in general psychology, combined with the knowledge of resilience-related topics in sport, helped begin to answer the question: How should we measure psychological resilience in sport performers? Based on this review, it was recommended that researchers utilize the empirical knowledge base in the pivotal resilience-related areas of stressors and protective factors. This suggestion was addressed in chapter two

(part two). To the best of my knowledge, this is the first review of resilience in sport. The narrative approach adopted for this review allowed for extensive coverage of psychological resilience in sport performers and will subsequently help researchers to gain a deeper profundity of resilience in sport. Collectively, the two reviews enabled vast empirical knowledge in key resilience-related areas to be exploited and the SRS items to be sufficiently justified. Indeed, I would argue that the SRS is one of the few resilience questionnaires to possess such a strong evidence base.

Second, building on the consensus that a measure of psychological resilience in athletes is needed to advance sport psychologists' understanding of this area (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011), the research in chapter three (studies one-three) described the development of the first valid and reliable measure of psychological resilience in sport performers. A notable strength of the SRS is that it realizes a complete and accurate representation of psychological resilience by basing its assessment on a well-established tripartite conceptualization (see, for a review, this volume, chapter two, part one), namely the measurement of adversity (or stressors), protective factors, and positive adaptation. Most of the current measures of resilience in the psychology literature only assess protective factors (Windle et al., 2011) despite the assertion by prominent scholars that resilience is inferred based on the assessment of adversity and positive adaptation (Luthar, 2006; Luthar and Zelazo, 2003; Masten & Obradovic, 2006). Although two recent measures assess adversity (or stressors), namely the Multiracial Challenges and Resilience Scale (MSRS; Salahuddin & O'Brien, 2011) and the Academic Risk and Resilience Scale (ARRS; Martin, 2013), the SRS is the first resilience measure to assess all three components of psychological resilience. Due to the measurement approach taken, in part, a related strength of the SRS is its ability to be employed at both a broad or fine-grained level depending on the nature of the research. Specifically, researchers interested in a general measure of psychological resilience can use the broader measurement model where resilience is represented by three higher-order factors (viz. stressors, protective factors, and positive adaptation) and for those interested in examining the relationships between specific resilience-related factors and other concepts, the nine first-order factor model (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances, Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being) can be adopted to provide a more in-depth assessment.

Third, using the broader SRS measurement model, the research in chapter four

(studies four and five) provided the first quantitative test of a relatively new theoretical model of sport resilience (Fletcher & Sarkar, 2012). Galli and Vealey (2008) proposed that researchers should conduct quantitative studies to further investigate resilience in an athletic context and in chapter two (part two) I subsequently asserted that future studies should use the grounded theory of psychological resilience as a starting point to answer specific questions about resilience in sport. These recommendations were addressed in chapter four (studies four and five). Specifically, this research was the first to provide quantitative support for Fletcher and Sarkar's (2012) model of sport resilience by illustrating the moderating role of protective factors (Study 4) and the mediating role of cognitive appraisal (Study 5). A noteworthy strength of Study 4 was the use of the Johnson-Neyman technique (Johnson & Neyman, 1936) to identify the regional significance of the conditional direct effect (of stressors on athletes' positive adaptation) across levels of protective factors. To the best of my knowledge, this is only the second study in the sport psychology literature to employ this statistical technique (see also Curran et al., 2013). The results of Study 4 are the first to indicate that there is a minimum level of protective factors that athletes need to possess (viz. 4 out of 5 or an average level of 80%) to ensure shielding from negative consequences. A noteworthy strength of Study 5 was the use of the distribution of the products method (*PRODCLIN* programme; MacKinnon et al., 2007; Tofighi & MacKinnon, 2011) to calculate indirect effects and their 95% confidence intervals (rather than just probabilities) to further test the mediating role of challenge and threat appraisal. The results of Study 5 are the first to (quantitatively) illustrate that stressors predict higher positive adaptation via challenge appraisal whereas stressors predict lower positive adaptation via threat appraisal.

Notwithstanding these strengths, it is worth highlighting some of the limitations of the research reported in this thesis. In my view, the main limitations of this thesis relate specifically to the SRS and, more generally, to the quantitative assessment and examination of psychological resilience in sport performers. With regards to the SRS, although the first-order, nine factor, 36-item model demonstrated acceptable factorial validity by meeting the SRMR, RMSEA, and original CFI guidelines, the SRS did have three psychometric issues. First, the measurement model did not meet Hu and Benter's (1999) revised CFI cutoff value of .95. Second, three factors (viz. Personal Commitments and Circumstances, Autonomous Values and Beliefs, Proactive Personality) appeared to have statistical deficiencies regarding internal consistency (α = .61 to .68). Third, although the two-item factor relating to Coach Issues was deemed reliable (α = .80), it is generally accepted that subscales should consist of three or more items (Howell, 2011; MacCallum et al., 1996; Tabachnick & Fidell, 2007).

In terms of the data collected via the SRS, like most other measures of resilience in the general psychology literature (see, for a review, Windle et al., 2011), the SRS relies solely on self-report data. Although an individual's own reports provide insights into his or her perceptions of resilience, self-report measures introduce the possibility of bias due to common method variance and this systematic source of measurement error can inflate associations among constructs (Podsakoff et al., 2003). This drawback of the SRS may be attenuated by incorporating other methods (e.g., physiological indices) into a study design.

Another potential limitation of the SRS is the rather simplistic scoring system (see Appendix 5). Currently, an athlete's resilience score is calculated by summing the nine first-order factors or the three higher-order factors depending on which measurement model is employed. This approach to scoring resilience gives equal weighting to stressors, protective factors, and positive adaptation without taking into the account the relative contributions of each area. In chapters one and two, it was mentioned that assessment decisions should be determined by the seriousness of the risk under consideration (see, for a review, this volume, chapter two, part one). To illustrate, if an individual is exposed to a serious life adversity it is sufficient to justify the existence of positive adaptation in terms of normal functioning. If the adversity is not as severe, but is nonetheless relatively taxing, then it is entirely appropriate to expect excellent functioning in the specific domain as evidence of positive adaptation. With this example in mind, the present scoring system cannot currently differentiate between a sport performer who scores high on stressors and low to mid-range on positive adaptation and another similarly resilient athlete who scores low to mid-range on stressors and high on positive adaptation. Accordingly, a more complex algorithm may be beneficial to differentiate between similar, but different, resilience profiles. Subsequently, the SRS could then help describe the eight main types of profile someone can exhibit, the differences between them, and what an athlete needs to work on to develop resilience. By identifying an athlete's resilience profile, this will enable the SRS to be used practically for idiographic use.

Profile 1: Low stressors, low protective factors, and low positive adaptation

Profile 2: High stressors, low protective factors, and low positive adaptation

Profile 3: High stressors, high protective factors, and low positive adaptation

Profile 4: Low stressors, high protective factors, and low positive adaptation

Profile 5: Low stressors, high protective factors, and high positive adaptation

Profile 6: Low stressors, low protective factors, and high positive adaptation

Profile 7: High stressors, low protective factors, and high positive adaptation

Profile 8: High stressors, high protective factors, and high positive adaptation

In terms of the quantitative assessment and examination of psychological resilience in sport performers more generally, a major limitation concerns the cross-sectional nature of the data collected in chapter three and the cross-sectional design adopted in chapter four. This approach precluded any examination of test-retest reliability and predictive validity and any inference of directionality or causality among the variables in chapters three and four respectively. Although many researchers in the (sport) psychology literature mention this problem as a drawback to their research, it is a particular noteworthy issue to mention in light of the present thesis due to the dynamic and temporal nature of resilience (Luthar et al., 2000).

As alluded to in chapter two, another broad limitation of the quantitative assessment and study of resilience is the issue of gauging "high competence" within a sample being examined since the reference group is usually the sample itself and not any larger normative group. As a result, when using the SRS in chapter three, little was known about how the most competent (resilient) individuals within the sample compared with those in low-risk groups. Indeed, it is possible – if one were to make comparisons with the general athletic population for example – that the highest levels of competence within the sample were merely the best of a generally poorly functioning group (cf. Mulholland et al., 1991). Similarly, in chapter four, when examining the relationships between stressors, protective factors, and positive adaptation (i.e., a variable-focused approach), the multivariate analyses employed conveyed nothing about how many athletes within the particular sample meet the dual criteria of high adversity (or stressors) and high positive adaptation. In addition, with this variable-focused strategy, it was not possible to isolate which (specific) stressors and protective factors were contributing to the interaction and to the inferred resilience processes.

Finally, a shortcoming of the work in this thesis is that it examined a limited number of relationships. Although the research in chapter three found support for the concurrent validity of the SRS by reporting significant correlations between stressors (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances) and perceived stress, sport-specific protective factors (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality) and general resilient qualities, and positive adaptation (viz. Perceived Sport Competence, Hedonic Well-Being) and thriving, it would be useful to examine in greater detail the correlations reported in this paper and moreover, observe the relationships between the SRS factors and other relevant concepts (e.g., coping, growth). Furthermore, although chapter four examined the moderating role of protective factors (Study 4) and the mediating role of cognitive appraisal (Study 5), the

research did not assess meta-cognitive processes that involve reflecting on one's initial reaction to stressors. When discussing the results of their grounded theory of psychological resilience, Fletcher and Sarkar (2012) noted that meta-cognitions may be particularly salient in highly demanding performance environments, where an athlete may initially appraise a stressor in a negative manner, but further evaluate the result emotion as having the potential to facilitate performance, and thereby maintain resilience in stressful situations. It would be beneficial for researchers to test the complete theoretical model of sport resilience (i.e., by including meta-cognition) and to incorporate aspects of complementary theories, for example the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001), that further illuminates how individuals develop personal assets and psychologically protect themselves from potentially stressful encounters.

5.25 Future research directions. This thesis suggests that psychological resilience in sport performers is likely to be a fruitful avenue for researchers to explore. In the context of the present discussion, future research directions are split into two broad areas: the assessment of resilience and methodological advancements in resilience research.

Regarding the assessment of resilience, I will discuss five main avenues that I believe will advance sport psychologists' knowledge and understanding of this area. First, although the SRS demonstrates acceptable factorial validity when measuring psychological resilience in sport performers, future research should continue to test the factor structure, validity, and reliability of the SRS. Exploratory structural equation modeling (ESEM; Asparouhov & Muthén, 2009) should be considered as a viable approach in this regard. Recently introduced to the academic community, ESEM is a novel methodological extension of traditional factor analyses in which the strengths of both CFA and EFA are integrated within a structural equation modeling framework. Specifically, ESEM avoids the strict requirements of CFA (i.e., only certain items load onto certain factors, nontarget loadings are constrained to be zero) by allowing all item indicators to be directly influenced by all common factors as in EFA, while at the same time providing access to robust indicators of model adequacy (e.g., parameter estimates, goodness-of-fit-statistics, standard errors) that are typically associated with CFA. When compared with CFA, ESEM is less likely to distort (i.e., inflate and bias) factors and structural relations and thereby improve the likelihood of adequate model data fit because it does not inappropriately impose nontarget loadings to be constrained to zero (Asparouhov & Muthén, 2009; Marsh et al., 2009). It is an invaluable approach particularly for ongoing work (Booth & Hughes, 2014) with an emerging body of research in the sport literature supporting its superiority for the examination of psychological constructs such as

coaching efficacy (Myers, Chase, Pierce, & Martin, 2011), mental toughness (Gucciardi, Hanton, & Mallett, 2012), and impression motivation (Payne, Hudson, Akehurst, & Ntoumanis, 2013). Bayesian structural equation modelling (BSEM) also offers an alternative to the restrictions imposed by CFA. Specifically, by replacing constrained specifications (e.g., fixing parameters at zero) with approximate zeros using informative (i.e., zero mean and small variance) "priors" based on substantive theory or previous research (Muthén & Asparouhov, 2012), the Bayesian approach allows for some degree of uncertainty in the parameters by applying a less restrictive operationalization of one's substantively driven measurement model. The analytical and epistemological distinctions between Bayesian and frequentist (e.g., CFA) estimation (see, for a review, Dienes, 2011; Lynch, 2010) means that, through the use of Bayesian methods, scholars may be able to learn more about parameter estimates and model fit, obtain better small-sample performance, perform less computationally demanding analyses, and analyze new types of models (Muthén & Asparouhov, 2012). Adopting a Bayesian perspective is a novel approach that enables scholars to empirically test the probability of a theoretical model including expectations regarding the direction and strength of relationship among the respective constructs based on previous research, given one's data (for an application of this approach see Gucciardi & Jackson, 2015; Jackson, Gucciardi, & Dimmock, 2014). Future research should consider the utility of both ESEM and BSEM for the further development and validation of the SRS.

Second, although the SRS provides insights into an individual's perceptions of resilience, researchers should incorporate physiological indices into a study design to attenuate the drawback of the self-report nature of the SRS. For decades, resilience research has focused on psychological variables but "we are now into a new era with concerted attention to biology" (Luthar et al., 2006, p. 109). In a seminal overview paper, Curtis and Cicchetti (2003) explained the role of diverse biological processes ranging from neuroendocrinology to capacities for emotion regulation. Due to the importance of the person-environment interaction in resilience inquiry (cf. Egeland et al., 1993), "it will be necessary to combine psychosocial and biological research approaches" (Rutter, 2006, p. 10). In the athletic context, Fletcher and Sarkar (2012) noted that it may be beneficial for sport psychologists interested in examining the stress-resilience-performance relationship to consider recent evidence from cognitive neuroscience. Specifically, researchers interested in further investigating resilience in sport should consider the neurochemical factors that characterize psychobiological resilience and that has predictive value regarding successful adaptation to stress (see, for a review, Charney, 2004; Haglund, Nestadt, Cooper, Southwick,

& Charney, 2007). For example, neuropeptide Y (NPY) is a 36-amino acid neuropeptide that acts as a neurotransmitter in the brain and in the autonomic nervous system of humans. Preliminary work with combat veterans and special operations soldiers has indicated that higher levels of NPY may be associated with resilience against and recovery from posttraumatic stress disorder (Yehuda, Brand, & Yang, 2006), and by dampening the fear response, allows individuals to perform better under stress (Morgan et al., 2000). NPY's protective effects against posttraumatic psychopathology, in addition to its beneficial effects on performance under stress, suggest that the peptide could be an effective pharmacotherapy for enhancing resilience to stress (Haglund et al., 2007). In addition, cortisol is a hormone that is released in response to stress, sparing available glucose for the brain, and generating new energy from stored reserves. Excessive and sustained cortisol secretion, however, can have serious adverse effects: physiological (Whitworth, Williamson, Mangos, & Kelly, 2005), and psychological (Carroll et al., 2007). Preliminary work has indicated that resilience training can lead to large reductions in cortisol response during a critical incident police work simulation (Arnetz et al., 2009), and that trait reappraisal is associated with resilience to acute psychological stress as measured by cortisol, heart rate, and self-report measures (Carlson, Dikecligil, Greenberg, & Mujica-Parodi, 2012). Future research should collect well-established physiological indicators of resilience to further corroborate the utility of the self-report SRS measure.

Third, another important consideration when assessing resilience in sport is the sociocultural context in which an individual operates (this volume, chapter two, part two). The SRS predominantly focuses on *psychological* concepts and thus, future resilience researchers need to investigate the extent to which the measure is culturally sensitive (cf. Clauss-Ehlers, 2008). One scale in the general psychology literature, the Child and Youth Resilience Measure (CYRM; Ungar & Liebenberg, 2011; Ungar et al., 2008), has received extensive development and piloting within eleven countries, although the authors note that resilience definitions are often equivocal when observed through different cultures (Ungar et al., 2008). Thus, the meaning of resilience may be culturally and contextually dependent. It is important to identify what the benchmark for 'success' might be for different cultures, who might place different values on such criteria (Fletcher & Sarkar, 2013; Windle et al., 2011). To illustrate, Ungar and colleagues (Ungar, 2008; Ungar & Liebenberg, 2011; Ungar et al., 2008) argued that resilience research has predominantly defined positive adaptation from a Western psychological discourse with an emphasis on individual and relational capacities, such as academic success and healthy relationships. According to Ungar and colleagues,

these outcomes lack sensitivity to cultural factors that contextualize how resilience is defined by different populations and manifested in different practices. Ungar et al. (2008) refer to the 'emic' perspective, which strives to comprehend a concept from a person within the culture to ensure contextual sensitivity. From this perspective, the concept of resilience may not necessarily be comparable across cultures. Having said that, Ungar et al. (2008) found that the key factors underlying resilience were universally accepted across their participating countries, but they were perceived differently by the youths completing the questionnaire. Although resilience is deemed to be a universal phenomenon that occurs across cultures and countries, further research is needed to test the psychometric properties of the SRS in different cultural contexts (cf. Yang & Jowett, 2012). Although the SRS was administered to participants from 51 nationalities in chapters three and four, future research is required to statistically test the instrument's structural and measurement equivalence across diverse cultural groups (cf. Byrne et al., 2009).

Fourth, although the hierarchical measurement model was utilized effectively in chapter four as a general measure of psychological resilience, resilience researchers in sport should adopt the nine-factor model in the future to provide a more in-depth assessment about the relationships between specific resilience-related factors. In terms of stressors, although the hierarchical model provides information about the different types of environmental demands, there is limited knowledge about the interface between and interactive impact of stressors (this volume, chapter two, part two). Using the three stressor subscales (viz. Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances), it would be beneficial, for example, to investigate the relationship between competitive, organizational and personal stressors and examine their combined effect on athletes' reactions and responses (cf. Brough & O'Driscoll, 2005). Turning to the protective factors that help athletes withstand stressors, the hierarchical model can be used to identify the psychological characteristics that an athlete needs to exhibit resilience and, as shown in chapter four, the optimum level of these factors to protect athletes from negative consequences. However, using the four protective factors subscales (viz. Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality), future research should investigate whether a matching effect exists between protective factors and stressors; that is whether particular protective factors match best with certain stressors (this volume, chapter two, part two). Furthermore, sport psychology researchers need to examine the aforementioned factors at an even more fine-grained level to determine which factors moderate associations between stressors and adaptive outcomes (i.e., protective) and which

factors have a direct association with adaptive outcomes (i.e., promotive) (cf. Laird et al., 2011). In terms of positive adaptation, initial correlational data (studies two and three) indicate that there is a link between the two respective sub-scales: Perceived Sport Competence and Hedonic Well-being (r = .61 and .60 in studies two and three respectively). Building on the findings of chapter four (studies four and five), resilience researchers in sport should compare the direct and indirect effects of stressors on athletes' positive adaptation across the two associated outcomes.

Finally, the findings from chapter three (Study 3) indicate that the SRS is invariant across different groups including sport type (team and individual). As a result, it is possible for researchers to assess psychological resilience across different groups of sport performers, including team and individual athletes, and make meaningful comparisons between them. However, team resilience research suggests that a resilient team is likely to be more than a collection of resilient individuals (see Morgan et al., 2013; 2015). For team resilience research and measurement in sport, this indicates that team resilience should be operationalized and assessed differently at different levels of analysis. When developing a measure of team resilience in competitive sport, researchers should use multilevel modelling to disaggregate individuals' perceptions of the team's resilience from team-level resilience. Chan's (1998) typology of composition models provides an excellent framework for organizing, evaluating, and developing constructs in multilevel research (e.g., to extend the assessment of individual-level resilience to the team-level).

Regarding methodological advancements in resilience research, I will discuss five main avenues that I believe will advance sport psychologists' knowledge and understanding of this area. First, although cross-sectional designs were appropriate for developing and validating the SRS and initially exploring relationships in this area, future research should adopt longitudinal designs to better capture the complex and dynamic nature of psychological resilience (cf. this volume, chapter two, part one). Indeed, longitudinal studies are important in determining the stability of resilience across an individual's lifespan (Heller et al., 1999; Kinard, 1998; Luthar, 2006; Walsh et al., 2010; Windle, 1999). In terms of the quantitative assessment and examination of psychological resilience, Gucciardi et al. (2011) argued that it is crucial that researchers explore the factor structure stability and item consistency – within and across individuals – in a longitudinal fashion. When employing a prospective research design, it has been proposed that scholars should ideally obtain measurements on at least three separate occasions, with assessments spaced far enough in time to enable the hypothesized protective factors to exert their effects (Luthar et al., 2000). To illustrate, in the

context of sport performance, it would be useful to assess an athlete's protective factors before, during, and after an adverse event (e.g., serious injury) to determine any potential changes in the relationship between stressors and positive adaptation. In terms of the qualitative exploration of psychological resilience, Galli and Vealey (2008) noted that future research should employ longitudinal qualitative designs (e.g., multiple interviews with athletes over time) to explore the dynamic nature and temporal course of psychological resilience. Moreover, Fletcher and Sarkar (2012) stated that life-span based studies, examining relationships between resilience, stress and performance from a longitudinal perspective, is necessary. Indeed, utilizing a longitudinal design when researching this desirable construct represents a useful approach that is consistent with the conceptualization of resilience as a dynamic process of positive adaptation to adversity (Luthar, 2006).

Second, to address potential interpretive ambiguities in athlete-related resilience studies that may initially arise due to a lack of a quantitative benchmark, sport psychology researchers should provide qualitative characterizations of a subset of athletes within the group being examined (this volume, chapter two, part one). That is, resilience researchers in sport should consider adopting mixed method research designs (cf. Alex, 2010; West, Buettner, Stewart, Foster, & Usher, 2012). For example, West et al. (2012) conducted an explanatory sequential mixed methods study to measure and explore family resilience. In this type of design, the researcher first gathers and analyzes the quantitative data, which is followed by a qualitative phase undertaken to help explain the quantitative results (Cresswell & Clark, 2011). In the initial quantitative phase of West et al.'s (2012) study, assessment measures were administered including the Connor-Davidson Resilience Scale (CD-RISC; Connor & Davidson, 2003). Data were collected and analyzed from 31 family cases (n = 67 participants). In the second, qualitative phase, follow-up semi-structured interviews were undertaken with 10 families to help explain the quantitative results. According to West et al. (2012), the combination of both quantitative and qualitative data in the final phase enhanced the overall outcome of the study by providing a more complete account of the results. Similarly, Alex (2010) noted that integrating both sets of data (i.e., quantitative and qualitative) can offer a new perspective on our knowledge and comprehension of resilience. Specifically, Alex (2010) used the Resilience Scale (RS; Wagnild & Young, 1993) to identify elderly individuals with estimated high resilience before using thematic narrative interviews to investigate their resilience in more depth. This approach may be useful for researchers interested in further investigating resilience in sport. Indeed, when reviewing psychometric issues in resilience research and discussing the implications for sport psychology, in chapter

two (part one), I suggested that potential interpretive ambiguities that may currently arise due to a lack of a quantitative benchmark can be (partially) addressed by providing qualitative characterizations of exemplar resilient individuals within the group in question.

Third, although chapters four and five explored the relationships between SRS factors and relevant concepts (e.g., perceived stress, thriving, and cognitive appraisal), future research needs to examine the relationships between sport resilience and other pertinent concepts. For example, although resilience and coping are often used interchangeably, there is a growing body of evidence to suggest that these are conceptually distinct constructs (Campbell-Sills et al., 2006; Compas et al., 2001; Major et al., 1998; Karoly & Ruehlman, 2006; Van Vliet, 2008). Based on the collective body of work supporting the distinction between resilience and coping, Fletcher and Sarkar (2013) proposed that "resilience is characterized by its influence on one's appraisal prior to emotional and coping responses and by its positive, protective impact, whereas coping is characterized by its response to a stressful encounter and by its varying effectiveness in resolving outstanding issues" (p. 16). Future research in sport psychology needs to test this postulation empirically. Putwain, Connors, Symes, and Douglas-Osborn (2012) took this approach in the education context with the concept of academic buoyancy, which refers to a positive, constructive, and adaptive response to the types of challenges and setbacks experienced by students in a typical and everyday academic setting (Martin & Marsh, 2006, 2008). Using hierarchical regression analysis, Putwain et al. (2012) found that academic buoyancy explained a significant additional proportion of variance in test anxiety when the variance for coping had been accounted for. Sport psychology researchers should adopt a similar approach with resilience to quantitatively test whether resilience can be considered a distinct construct from that of coping. To provide another example, resilience and growth are often confused in the psychology literature (Westphal & Bonnano, 2007). For instance, it is debated as to whether or not growth is a form of resilience, and argued whether or not growth is superior to resilience. The two studies that have examined the relationship between resilience and growth are somewhat inconclusive (Bensimon, 2012; Levine, Laufer, Stein, Hamama-Raz, & Solomon, 2009). Levine et al. (2009) found that high levels of resilience were associated with the lowest growth scores and Bensimon (2012) found that resilience was positively associated with growth. Thus, future research is needed to elucidate the relationship between resilience and growth. In addition, it would be beneficial for researchers to incorporate aspects of complementary theories that further illuminate how individuals develop resilience. The most widely cited theory that suggests how a certain factor influences resilience is the broaden-

and-build theory of positive emotions (Fredrickson, 1998, 2001). This theory proposes that positive emotions (such as joy and contentment) broaden a person's initial thought-action inventory, which involves expanding the range of thoughts and possible actions that come to mind when faced with an adverse situation. As a result of this broadened mindset, an individual develops a greater range of available resources (physical, intellectual and social), which can be likened to the enhancement of resilience protective and promotive factors. To test this theory, Tugade and Fredrickson (2004) examined the relationship between positive emotions and psychological resilience. Mediational analysis found that positive emotions helped participants to attain efficient emotional regulation, expressed by quick cardiovascular recovery from negative emotional arousal (studies 1 and 2) and by finding positive meaning in negative circumstances (study 3). In support of these findings, subsequent studies also point to the importance of positive emotions in relation to psychological resilience (Bonanno, 2004; Campbell-Sills et al., 2006; Gu & Day, 2007; Jackson et al., 2007; Van Vliet, 2008). Sport psychology researchers need to explore the role of positive emotions in developing personal assets and psychologically protecting athletes from potentially stressful encounters.

Fourth, the work in this thesis focused on positive outcomes in response to stressors. Future research needs to consider negative outcomes in resilience research. In their quantitative study, Gucciardi et al. (2011) included a measure of athlete burnout to provide an indication of the relationship between resilient qualities (i.e., protective factors) and negative symptoms or pathology associated with exposure to stressors. As anticipated, the resilient qualities assessed with the CD-RISC evidenced negative and moderate correlations with burnout. The authors proposed that resilience may offer one explanation as to why some athletes who experience high levels of stress fail to burnout. However, the cross-sectional nature of the study does not permit the conclusion of such causal claims (Gucciardi et al., 2011). Sport psychology researchers should conduct prospective studies in which the stressors and protective factors subscales of the SRS are initially observed, with additional measures of positive adaptation (i.e., the SRS subscales of Perceived Sport Competence and Hedonic Well-being) and negative symptoms and pathology (e.g., burnout) taken several months later. Subsequently, one could test whether the protective factors moderate the relationship between stressors and both positive adaptation and negative outcomes. Furthermore, in their qualitative study, Galli and Vealey (2008) noted that the athletes interviewed expressed having successfully overcome adversity (see also Fletcher & Sarkar, 2012) and that future qualitative and quantitative research should focus on athletes who have not adapted well to adversity, for example athletes who turn to performance enhancing drugs

as a result of performance failures. Specifically, they proposed that a detailed investigation of sport performers who have succumbed to adversity may provide useful insight into what factors and processes influence resilience in an athletic context (Galli & Vealey, 2008).

Fifth, resilience intervention studies are required in sport. As a caveat to this recommendation, Fletcher and Sarkar (2012) argued that "it is important that such work is grounded in systematic resilience research programs rather than piecemeal and incomplete strategies based on, for example, the mental toughness, hardiness or coping literatures. Such research programs, which should be underpinned by the conceptual and theoretical advances already made in this area in general psychology (cf. Fletcher & Sarkar, 2013), will provide the most rigorous and robust platform from which to develop resilience training in sport" (p. 676; see also Robertson, Cooper, Sarkar, & Curran, in press). For example, the CSF program designed to develop resilience in soldiers, family members, and Army civilians was adapted primarily from the Penn Resiliency Program (PRP; see, for a review, Brunwasser, Gillham, & Kim, 2009). Notwithstanding the program's foundation, Eidelson, Pilisuk, and Soldz (2011) voiced a number of conceptual and ethical concerns of the CSF intervention. Conceptually, they contended that the resilience program should have been convincingly demonstrated *first* in carefully conducted randomized controlled trials before being rolled out under less controlled conditions, that the model upon which the CSF program is based was developed on dramatically different (non-military) populations and therefore cannot be generalized to the challenges that soldiers face in combat, and that the PRP's effects seemed to be unrelated to the "resilience" theory undergirding the program. Ethically, they argued that "resilience training could . . . harm . . . soldiers by making them more likely to engage in combat actions that adversely affect their psychological health" (Eidelson et al., 2011, p. 643). Moreover, they provided a general critique of positive psychology that bore on the foundation of CSF. This included its failure to appreciate the valuable functions played by "negative" emotions such as anger, guilt, and fear; its disregard for harsh societal realities such as poverty and oppression; and its promotion of claims without sufficient scientific support (cf. Coyne & Tennen, 2010). Using the CSF resilience program as an example and taking its critique on board, when implementing resilience intervention studies, sport psychology researchers should ensure that a rigorous methodological design is employed (ideally a randomized controlled trial), that the intervention is underpinned by conceptual and theoretical context-specific knowledge of resilience, that the "dark side" of resilience is addressed, and that the program draws on humanistic and other perspectives that may not be covered in the field positive psychology (cf. Robertson et al., in press).

5.3 Conclusion

Although psychological resilience is important in competitive sport (Fletcher & Sarkar, 2012; Galli & Vealey, 2008; Gucciardi et al., 2011), to date no measure has been developed to comprehensively and accurately assess this phenomenon in the sport context. The work reported in this thesis addresses this fundamental issue by investigating the assessment of psychological resilience in sport performers. In an initial series of three related studies, the research developed and validated the first sport-specific measure of resilience, namely the Sport Resilience Scale (SRS). Based on the tripartite conceptualization of psychological resilience (this volume, chapter two, part one), the outcome was a 36-item scale that assesses the three components of psychological resilience (viz. stressors, protective factors, and positive adaptation) via nine subscales: Performance and Self Presentation Issues, Coach Issues, Personal Commitments and Circumstances, Perceived Social Support, Autonomous Values and Beliefs, Robust Confidence, Proactive Personality, Perceived Sport Competence, and Hedonic Well-Being. The findings provided evidence for the SRS's (content, factorial, and concurrent) validity, reliability, and invariance across different groups. Using the SRS, in a further two quantitative studies, the research found that high levels of protective factors buffered, shielded, or insulated athletes from the negative effects of stressors (Study 4) and stressors predicted higher positive adaptation via challenge appraisal (Study 5).

In terms of the thesis's contribution to the (sport) psychology literature, the SRS is the only resilience measure to date that assesses all three components of psychological resilience, and can be employed at both a broad or fine-grained level depending on the nature of the research. Moreover, the research reported in this thesis is the first to provide quantitative support for Fletcher and Sarkar's (2012) theoretical model of sport resilience by illustrating the moderating role of protective factors and the mediating role of cognitive appraisal. In ending, it is worth noting that although the research reported in this thesis realizes a complete and accurate assessment of psychological resilience in athletes, there is much work needed to be done to advance our knowledge and understanding of this area in the sport psychology literature. It is likely that this will only be achieved if researchers are open to learning lessons from other psychology sub-disciplines (e.g., cognitive neuroscience, cross-cultural psychology), employing more refined methodological designs, and adopting more sophisticated statistical techniques.

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Loughborough University

1st December 2011

Dear X,

We have recently developed a questionnaire and invite you to participate in the expert panel that helps us to validate it. The questionnaire is titled the "Sport Resilience Scale" (SRS) and explores how sport performers' react to and deal with pressurised situations. There are three parts to the scale:

Part one enquires about pressures sport performers' may have experienced in the past month.
Part two assesses sport performers' personal qualities and thoughts when experiencing these pressures
Part three considers sport performers' feelings about sport and life in relation to the pressures they have experienced.

This expert panel document consists of three sections:

Section A of this document requests information about your background.

Section B of this document provides you with some sample questions from each of the three parts of the SRS, and asks you about the relevance, clarity, and specificity of each question. It also gives you the opportunity to suggest modifications to the questions, or provide any further comments regarding your responses.

Section C of this document asks you about the format, layout, and presentation of the SRS.

If you are happy to participate, please complete and return this document by **Friday 23rd December 2011.** If you would prefer this document in paper format with an enclosed stamped addressed envelope, please let us know on the below contact details. Once again, thank you for your help.

Kind regards,

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SRS

EXPERT PANEL VALIDATION

SECTION A

Please complete the questions that are applicable to you

Name: _____ Age: _____ years _____ months

Gender: Male Female Nationality: _____

Sporting Background

Length of time competing in sport: _____ years _____ months

Main sport competed in: _____

Highest performance level (circle one):

International Senior national Collegiate/ University

State/Regional Junior national County Club

Other _____

Academic and/or Sport Psychology Background

Current Job Title: _____

Current Employer: _____

Length of time working in academia: _____ years _____ months

Highest qualification (circle one):

GCSE A-Level BSc MSc

MPhil PhD

Approximate number of publications in international peer reviewed journals: ___

Length of time providing sport psychology support: _____ years _____ months

Name of sport psychology accreditation: _____

Main sports that work with: _____

_____

SRS

EXPERT PANEL VALIDATION

SECTION B

Part One: Pressures

This part consists of questions that describe pressures that sport performers' may have experienced in the past month. For the purposes of the SRS, this part aims to measure stressors and is defined as:

Those events, situations, or conditions that place a demand on an individual

Below we have presented a sample of questions from part one. Please rate the suitability of each question by marking yes, no, or unsure in the relevant, clear, and specific columns. If you have any ideas of how the questions can be improved, please detail these in the comments box (below each question).

Part One		**RELEVANT**			**CLEAR**			**SPECIFICITY**		
In the past month I have experienced pressure associated with…		**Does this question potentially relate to the pressures experienced by sport performers?**			**Is this question easily understood?**			**Is this question general enough to capture all the related pressures in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
1.21	… my technical preparation for competition									
Q1.21 Comments:										
1.22	… moving house									
Q1.22 Comments:										
1.23	… not wanting to let others down									
Q1.23 Comments:										
1.24	… the communication within my team									
Q1.24 Comments:										

Part One		RELEVANT			CLEAR			SPECIFICITY		
In the past month I have experienced pressure associated with…		**Does this question potentially relate to the pressures experienced by sport performers?**			**Is this question easily understood?**			**Is this question general enough to capture all the related pressures in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
1.25	… discrimination									
Q1.25 Comments:										
1.26	… the way that my opposition behave									
Q1.26 Comments:										
1.27	… balancing my sport with my education/job									
Q1.27 Comments:										
1.28	… the facilities used for training or competition									
Q1.28 Comments:										
1.29	… a relationship breakdown									
Q1.29 Comments:										
1.30	… the sport officials that I have to come into contact with									
Q1.30 Comments:										

SRS

EXPERT PANEL VALIDATION

SECTION B CONTINUED

Part Two: Personal Qualities and Thoughts

This part consists of questions that describe personal qualities and thoughts sport performers' may have had when experiencing pressures. For the purposes of the SRS, this part aims to measure protective factors and is defined as:

Mental processes and behaviours that protect an individual from the potential negative effect of stressors

Below we have presented a sample of questions from part two. Please rate the suitability of each question by marking yes, no, or unsure in the relevant, clear, and specific columns. If you have any ideas of how the questions can be improved, please detail these in the comments box (below each question).

Part Two		**RELEVANT**			**CLEAR**			**SPECIFICITY**		
In relation to the pressures I have experienced in the past month...		**Does this question potentially relate to personal qualities and thoughts?**			**Is this question easily understood?**			**Is this question general enough to capture all the related personal qualities and thoughts in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
2.35	… constructive feedback would have been given to me by others if needed									
Q2.35 Comments:										
2.36	… there have been lots of ways around problems I have encountered									
Q2.36 Comments:										
2.37	… I valued challenging training sessions because they will improve my performance									
Q2.37 Comments:										

Part Two		RELEVANT			CLEAR			SPECIFICITY		
In relation to the pressures I have experienced in the past month...		**Does this question potentially relate to personal qualities and thoughts?**			**Is this question easily understood?**			**Is this question general enough to capture all the related personal qualities and thoughts in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
2.38	… If I made a mistake, my confidence was badly affected									
Q2.38 Comments:										
2.39	… I have been able to alter the focus of my attention as required by the situation									
Q2.39 Comments:										
2.40	… people around me would have given me advice if I was performing poorly									
Q2.40 Comments:										
2.41	… I have been looking for better ways to do things									
Q2.41 Comments:										
2.42	… I have actively chosen to perform in demanding situations									
Q2.42 Comments:										
2.43	… negative feedback from others has not affected by levels of confidence									
Q2.43 Comments:										
2.44	… I have been easily distracted by what has been happening around me									
Q2.44 Comments:										

Part Two		RELEVANT			CLEAR			SPECIFICITY		
In relation to the pressures I have experienced in the past month...		**Does this question potentially relate to personal qualities and thoughts?**			**Is this question easily understood?**			**Is this question general enough to capture all the related personal qualities and thoughts in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
2.45	… nobody would have helped me to organize and plan my competitions if I needed help									
Q2.45 Comments:										
2.46	… I was able to identify opportunities									
Q2.46 Comments:										
2.47	… my sport has been one of the best ways I have chosen to develop other aspects of my life									
Q2.47 Comments:										
2.48	… my confidence has remained stable despite fluctuations in my fitness									
Q2.48 Comments:										
2.49	… I concentrated on actions that have been relevant to my goals									
Q2.49 Comments:										
2.50	… I have someone who would have helped me with demanding tasks									
Q2.50 Comments:										

SRS

EXPERT PANEL VALIDATION

SECTION B CONTINUED

Part Three: Feelings about Sport and Life

This part consists of questions that describe how sport performers' might feel about sport and life in relation to the pressures they have experienced. For the purposes of the SRS, this part aims to measure positive adaptation and is defined as:

Indicators of well-being and competence

Below we have presented a sample of questions from part three. Please rate the suitability of each question by marking yes, no, or unsure in the relevant, clear, and specific columns. If you have any ideas of how the questions can be improved, please detail these in the comments box (below each question).

Part Three		**RELEVANT**			**CLEAR**			**SPECIFICITY**		
In relation to the pressures I have experienced in the past month...		**Does this question potentially relate to feelings about sport and life?**			**Is this question easily understood?**			**Is this question general enough to capture all the related feelings about sport and life in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
3.17	… I have felt successful at my sport									
Q3.17 Comments:										
3.18	… It seems that no matter what I have done, I have not performed as well as I should									
Q3.18 Comments:										
3.19	… If I could live my life over again, I would have changed many things									
Q3.19 Comments:										

Part Three		RELEVANT			CLEAR			SPECIFICITY		
In relation to the pressures I have experienced in the past month...		**Does this question potentially relate to feelings about sport and life?**			**Is this question easily understood?**			**Is this question general enough to capture all the related feelings about sport and life in this area?**		
		Yes	**No**	**Unsure**	**Yes**	**No**	**Unsure**	**Yes**	**No**	**Unsure**
3.20	… I have been satisfied with my life									
Q3.20 Comments:										
3.21	… I have felt so tired from my training that I have had trouble finding energy to do other things									
Q3.21 Comments:										
3.22	… I have been dissatisfied with the training my coach has provided me with									
Q3.22 Comments:										
3.23	… I have been satisfied with my individual performances in my sport									
Q3.23 Comments:										
3.24	… I have not been performing up to my ability in my sport									
Q3.24 Comments:										
3.25	… I have been happy with my life									
Q3.25 Comments:										

SRS

EXPERT PANEL VALIDATION

SECTION C

This section presents the proposed format of the SRS and the response scales used. It only includes the instructions and a sample of questions from the three parts of the scale. Following this, there are some questions regarding your general impression of the SRS format and response scales and whether you feel that any changes are required.

Instructions for Part One

This part consists of questions that describe pressures that you may have experienced in the past month.

For each question, place a tick in one box only to indicate how frequently this pressure placed a demand on you.

	In the past month I have experienced pressure associated with...	FREQUENCY				
		Never	Sometimes	Often	Very often	Always
		1	2	3	4	5
1.21	My technical preparation for competition					
1.22	Moving house					
1.23	Not wanting to let others down					

Instructions for Part Two

This part consists of questions that describe personal qualities and thoughts you may have had when experiencing pressures.

In relation to the pressures that you indicated in part one, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

In relation to the pressures I have experienced in the past month...		**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
2.35	Constructive feedback would have been given to me by others if needed					
2.36	There have been lots of ways around problems I have encountered					
2.37	I valued challenging training sessions because they will improve my performance					

Instructions for Part Three

This part consists of questions that describe how you might feel about sport and life in relation to the pressures you have experienced.

In relation to the pressures that you identified in part one, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

In relation to the pressures I have experienced in the past month...		Rating				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
3.17	I have felt successful at my sport					
3.18	It seems that no matter what I have done, I have not performed as well as I should					
3.19	If I could live my life over again, I would have changed many things					

General impressions

1. Are the instructions preceding part one of the SRS easy to follow? Is there anything else that we need to include?
2. Are the instructions preceding part two of the SRS easy to follow? Is there anything else that we need to include?
3. Are the instructions preceding part three of the SRS easy to follow? Is there anything else that we need to include?

4. Are there enough different response options for you to answer the questions?
5. Is there anything you would add to the SRS to improve it?
6. Is there anything you would delete to the SRS to improve it?
7. From the following names which one do you think best represents the questions that are posed? - Sport Resilience Scale (SRS) - Resilience Scale for Sport Performers (RS-SP) - Resilience in Sport Questionnaire (RSQ)
8. From the following names (full name and abbreviation) which one do you think is most aesthetically pleasing? - Sport Resilience Scale (SRS) - Resilience Scale for Sport Performers (RS-SP) - Resilience in Sport Questionnaire (RSQ)
9. Do you have any further comments on the SRS?

SRS SPORT RESILIENCE SCALE ©

This scale explores how sport performers react to and deal with pressurised situations. There are three parts to the scale:

***Part one* asks about pressures that you may have experienced in the past month.**
***Part two* describes personal qualities and thoughts that you may have displayed when experiencing these pressures.**
***Part three* considers how you might have felt about sport and life in relation to the pressures you have experienced.**

The questions contained within the scale will take about fifteen minutes to respond to.

To help us understand how sport performers react to and deal with pressure, we would like you to share your experiences with us in an open and honest way. With this in mind, please remember that there are no right or wrong answers to the questions because every performer is different.

Any personally identifiable information that you provide us with will remain confidential. Apart from the researchers, nobody will have access to any of your responses.

Several questions use the word 'team'. This refers to any of the people in your sport organization, such as managers, coaches, teammates, and support staff. If you represent more than one team in your main sport, please refer to the team that you have competed most frequently for in the past month.

If you understand the nature and purpose of this scale and you consent to complete it, please provide us with the following information before responding to the questions overleaf:

Today: _____ date _____ month _____ year

Name: _____ Age: _____ years _____ months

Gender (circle one): Male Female Nationality: _____

Current main sport: _____

Length of time competing in sport: _____ years _____ months

Current performance status (circle one): Full-time Part-time

Current performance level (circle one):

International	**Senior national**	**Collegiate/University**
State/Regional	**Junior national**	**County**
Club	**Other _____**	

Part One: Pressures

This part consists of questions that ask about pressures that you may have experienced in the past month.

For each question, place a tick in one box only to indicate how frequently this pressure placed a demand on you.

	In the past month, I have experienced pressure associated with...	**Frequency**				
		Never	**Sometimes**	**Often**	**Very often**	**Always**
		1	**2**	**3**	**4**	**5**
1.1	My physical preparation for competition					
1.2	The relationship with my coach					
1.3	Injuries					
1.4	My training commitments					
1.5	The relationships within my team					
1.6	My family responsibilities					
1.7	The selection process for my team					
1.8	A lack of personal finances					
1.9	Others' expectations of my performance					
1.10	A dip in my usual levels of performance					
1.11	My mental preparation for competition					
1.12	My coach's behaviour					
1.13	The death of someone close to me					
1.14	Balancing educational/work goals with sport pursuits					

	In the past month, I have experienced pressure associated with...	Frequency				
		Never	Sometimes	Often	Very often	Always
		1	2	3	4	5
1.15	My performance being evaluated by others in my team					
1.16	A serious illness					
1.17	Making mistakes during competition					
1.18	My relationship with significant others					
1.19	Changes in my sporting career					
1.20	My travel arrangements for training or competition					
1.21	My technical preparation for competition					
1.22	Moving house to a different town or city					
1.23	Not wanting to let others down					
1.24	The communication within my team					
1.25	Prejudice and discrimination from others					
1.26	The way that my opposition behave					
1.27	Balancing my sport with my education/job					
1.28	The facilities used for training or competition					
1.29	A relationship breakdown					
1.30	The sports officials that I have to come into contact with					

Part Two: Personal Qualities and Thoughts

This part consists of questions that describe personal qualities and thoughts that you may have displayed when experiencing pressures.

In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
2.1	I set myself high personal standards in training or competition					
2.2	I participated in my sport because of the pleasure I gained from the experience					
2.3	I gained confidence when I knew I was well-prepared					
2.4	I remained focused on the task at hand in the face of distractions					
2.5	Someone would have been there for me if I needed support					
2.6	I strived to be as perfect as possible in my sport					
2.7	I felt excited when I was involved in my sport					
2.8	I had belief in my ability to give maximum physical effort to succeed					
2.9	I switched my focus from sport to other areas of my life when required					
2.10	Someone would have showed concern for me if I needed help					
2.11	I expected more good things to happen to me than bad					
2.12	I participated in my sport because I enjoyed doing something to the best of my ability					
2.13	I felt confident when I performed well in competition					
2.14	I focused on my long-term goals rather than short-term distractions					

	In the past month...	Rating				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
2.15	People around me would have reinforced the positives in most situations					
2.16	I expected the best from most situations					
2.17	I felt a lot of personal satisfaction while mastering difficult techniques					
2.18	Performing well in training gave me confidence					
2.19	I have been able to concentrate on the key aspects of my performance					
2.20	Other people would have boosted my sense of competence if needed					
2.21	I thrived on competition					
2.22	My sport has been an important part of my life					
2.23	I had confidence about my coach's leadership					
2.24	I concentrated on actions that have been under my own control					
2.25	Someone would have increased my confidence to deal with pressure if needed					
2.26	I enjoyed competing against others					
2.27	My sport provided me with an opportunity to be myself					
2.28	I had belief that my coach would establish an appropriate training programme for me					
2.29	I had the ability to maintain my concentration over long periods of time					
2.30	People around me would have enhanced my self-esteem if needed					
2.31	I actively pursued my goals in training or competition					
2.32	Participation in my sport allowed me to live in a way that was true to my values					

	In the past month...	Rating				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
2.33	Coming back from difficult experiences has filled me with confidence					
2.34	I have been aware of the situation around me during competition					
2.35	Helpful feedback would have been given to me by others if needed					
2.36	There have been many solutions to the problems I have encountered in my sport					
2.37	I valued challenging training sessions because they improved my performance					
2.38	If I made a mistake, my confidence was not badly affected					
2.39	I focused my time and energy on behaviours that were relevant to my objectives					
2.40	People around me would have given me appropriate support if I was performing poorly					
2.41	I have constantly been looking for better ways to do things in training or competition					
2.42	I have actively chosen to engage with challenging situations					
2.43	Negative feedback from others has not affected my levels of confidence					
2.44	I remained focused on processes and not solely on outcomes					
2.45	Someone would have helped me to organize and plan my competitions if needed					
2.46	I have identified opportunities in the environment to improve my performance in sport					
2.47	I have valued the benefits of my sport					
2.48	My confidence has remained stable					
2.49	I have concentrated on actions that have been relevant to my goals					
2.50	Someone would have helped me with demanding tasks if required					

Part Three: Feelings about Sport and Life

This part consists of questions that consider how you might have felt about sport and life in relation to the pressures you have experienced.

In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
3.1	I had opportunities to feel good at my sport					
3.2	I have been satisfied with my dedication during training or competition					
3.3	I have learnt valuable lessons about life which have made me a stronger person					
3.4	I felt I could overcome challenges in my sport					
3.5	I had a sense of direction and purpose in life					
3.6	I achieved important things in my life					
3.7	I accomplished worthwhile things in my sport					
3.8	I have been satisfied with the degree to which I have reached my performance goals					
3.9	I have developed a lot as a person					
3.10	I have mastered challenging skills in my sport					
3.11	I have felt fulfilled by the activities that I have engaged in					
3.12	I have been satisfied with my life					

	In the past month...	Rating				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
3.13	My sport has been close to ideal					
3.14	I have been satisfied with the improvement of my skill level					
3.15	I have learnt a lot about my personal capabilities					
3.16	My life has been centred on a set of core beliefs that have given me meaning					
3.17	I felt I have been good at my sport					
3.18	I have been happy with my life					
3.19	I have had the ability to perform well in my sport					
3.20	I have been satisfied with my enthusiasm during training or competition					
3.21	I have been interested in gaining new experiences in life					
3.22	I have been satisfied with the training my coach has provided me with					
3.23	I have felt successful at my sport					
3.24	I have tried to develop my potential whenever possible					
3.25	I have been satisfied with my individual performance in my sport					

Thank you for completing this scale.

SPORT RESILIENCE STUDY

Thank you for expressing an interest in our study. The purpose of the research is to explore how sport performers react to and deal with pressurised situations.

The study involves completing four questionnaires contained within this document. There will be specific instructions for completing each questionnaire. The first questionnaire is a little longer and will take about ten minutes to respond to. The remaining three questionnaires are shorter and will take about five minutes in total to complete. **Please ensure that you have set aside enough time to complete the entire document as incomplete questionnaires cannot be used.**

Participation in our study is entirely voluntary. You do not have to take part if you do not want to. If you decide to take part, you may withdraw at any time without giving a reason. Any information obtained in connection with this study will remain confidential. The only people who will have access to the questionnaires will be the researchers listed below based at Loughborough University. In addition, the results of this study will only be published or disclosed to other people in a way that will not identify you.

All proposals for research using human participants are reviewed by an Ethics Committee before they can proceed. The Loughborough University Ethical Advisory Committee has reviewed and approved this proposal.

Thank you for reading this information sheet. Should you at any time have further questions about participation in this study, please do not hesitate to contact us using the details below.

Kind regards

Mustafa Sarkar BSc MSc
David Fletcher PhD CPsychol
Fehmidah Munir PhD CPsychol
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Leicestershire
LE11 3TU
Tel: 01509 228450
Email: M.Sarkar@lboro.ac.uk

If you understand the nature and purpose of this study and you consent to complete it, please provide us with a self-generated ID number below before contiuning:

Self-generated ID number:_____

(E.g., if your initials are MS and you are born on the 22nd, your self-generated ID number would be MS22)

SRS SPORT RESILIENCE SCALE ©

This scale explores how sport performers react to and deal with pressurised situations. There are three parts to the scale:

***Part one* asks about pressures that you may have experienced in the past month.**
***Part two* describes personal qualities and thoughts that you may have displayed when experiencing these pressures.**
***Part three* considers how you might have felt about sport and life in relation to the pressures you have experienced.**

The questions contained within the scale will take about ten minutes to respond to.

To help us understand how sport performers react to and deal with pressure, we would like you to share your experiences with us in an open and honest way. With this in mind, please remember that there are no right or wrong answers to the questions because every performer is different.

Any personally identifiable information that you provide us with will remain confidential. Apart from the researchers, nobody will have access to any of your responses.

Several questions use the word 'team'. This refers to any of the people in your sport organization, such as managers, coaches, teammates, and support staff. If you represent more than one team in your main sport, please refer to the team that you have competed most frequently for in the past month.

If you understand the nature and purpose of this scale and you consent to complete it, please provide us with the following information before responding to the questions overleaf:

Today: _____ date _____ month _____ year

Name: _____ Age: _____ years _____ months

Gender (circle one): Male Female Nationality: _____

Current main sport: _____

Length of time competing in sport: _____ years _____ months

Current performance status (circle one): Full-time Part-time

Current performance level (circle one):

International	**Senior national**	**Collegiate/University**
State/Regional	**Junior national**	**County**
Club	**Other _____**	

Part One: Pressures

This part consists of questions that ask about pressures that you may have experienced in the past month. For each question, place a tick in one box only to indicate how frequently this pressure placed a demand on you.

	In the past month, I have experienced pressure associated with...	Frequency				
		Never	Sometimes	Often	Very often	Always
		1	2	3	4	5
1.1	The relationship with my coach					
1.2	The relationships within my team					
1.3	My family responsibilities					
1.4	A lack of personal finances					
1.5	Others' expectations of my performance					
1.6	A dip in my usual levels of performance					
1.7	My mental preparation for competition					
1.8	My coach's behaviour					
1.9	My performance being evaluated by others in my team					
1.10	Making mistakes during competition					
1.11	My relationship with significant others					
1.12	My travel arrangements for training or competition					
1.13	Not wanting to let others down					
1.14	The communication within my team					

Part Two: Personal Qualities and Thoughts

This part consists of questions that describe personal qualities and thoughts that you may have displayed when experiencing pressures. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
2.1	I enjoyed competing against others					
2.2	If I made a mistake, my confidence was not badly affected					
2.3	I have constantly been looking for better ways to do things in training or competition					
2.4	Negative feedback from others has not affected my levels of confidence					
2.5	I have actively chosen to engage with challenging situations					
2.6	Someone would have showed concern for me if I needed help					
2.7	My sport provided me with an opportunity to be myself					
2.8	My confidence has remained stable					
2.9	I have identified opportunities in the environment to improve my performance in sport					
2.10	Someone would have increased my confidence to deal with pressure if needed					
2.11	Someone would have been there for me if I needed support					
2.12	I remained focused on processes and not solely on outcomes					

	In the past month...	**Rating**				
		Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
		1	**2**	**3**	**4**	**5**
2.13	Other people would have boosted my sense of competence if needed					
2.14	Participation in my sport allowed me to live in a way that was true to my values					
2.15	I focused my time and energy on behaviours that were relevant to my objectives					
2.16	People around me would have given me appropriate support if I was performing poorly					
2.17	I have valued the benefits of my sport					
2.18	I had the ability to maintain my concentration over long periods of time					
2.19	Helpful feedback would have been given to me by others if needed					
2.20	People around me would have reinforced the positives in most situations					

Part Three: Feelings about Sport and Life

This part consists of questions that consider how you might have felt about sport and life in relation to the pressures you have experienced. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	Rating				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
3.1	I felt I have been good at my sport					
3.2	I had a sense of direction and purpose in life					
3.3	I have felt successful at my sport					
3.4	I achieved important things in my life					
3.5	I have been satisfied with my individual performance in my sport					
3.6	I have been satisfied with my life					
3.7	I have had the ability to perform well in my sport					
3.8	I have learnt valuable lessons about life which have made me a stronger person					
3.9	I have been satisfied with the improvement of my skill level					
3.10	I have been happy with my life					
3.11	I have been satisfied with the degree to which I have reached my performance goals					
3.12	I have mastered challenging skills in my sport					

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month. For each case, please indicate your response by placing a tick in one box only representing how often you felt or thought a certain way.

	In the last month how often have you…	Frequency				
		Never	Almost never	Sometimes	Fairly often	Very often
		0	1	2	3	4
1	Been upset because of something that happened unexpectedly?					
2	Felt that you were unable to control the important things in your life?					
3	Felt nervous and stressed?					
4	Felt confident about your ability to handle your personal problems?					
5	Felt that things were going your way?					
6	Found that you could not cope with all the things that you had to do?					
7	Been able to control irritations in your life?					
8	Felt that you were on top of things?					
9	Been angered because of things that were outside your control?					
10	Felt difficulties were piling up so high that you could not overcome them?					

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior, 24,* 385-396.

CONNOR-DAVIDSON RESILIENCE SCALE 10 (CD-RISC 10)

Please indicate how much you agree with the following statements as they apply to you over the last month. If a particular situation has not occurred recently, answer according to how you think you would have felt.

		Rating				
		Not true at all	Rarely true	Sometimes true	Often true	True nearly all the time
		0	1	2	3	4
1	I am able to adapt when changes occur					
2	I can deal with whatever comes my way					
3	I try to see the humorous side of things when I am faced with problems					
4	Having to cope with stress can make me stronger					
5	I tend to bounce back after illness, injury, or other hardships					
6	I believe I can achieve my goals, even if there are obstacles					
7	Under pressure, I stay focused and think clearly					
8	I am not easily discouraged by failure					
9	I think of myself as a strong person when dealing with life's challenges and difficulties					
10	I am able to handle unpleasant or painful feelings like sadness, fear and anger					

Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson resilience scale (CD-RISC). *Depression and Anxiety, 18,* 76-82.

THRIVING

Using the scale below, please answer the following questions in relation to your current experiences in sport.

	In my sport...	Rating						
		Strongly disagree	Disagree	Slightly disagree	Neutral	Slightly agree	Agree	Strongly agree
		1	2	3	4	5	6	7
1	I feel alive and vital							
2	I have energy and spirit							
3	I am looking forward to each new day							
4	I continue to learn more and more as time goes by							
5	I do not feel very energetic							
6	I am not learning							
7	I have developed a lot as a person							
8	I feel alert and awake							
9	I find myself learning often							
10	I see myself continually improving							

Porath, C., Spreitzer, G., Gibson, C., & Garnett, F. G. (2012). Thriving at work: Toward its measurement, construct validation, and theoretical refinement. *Journal of Organizational Behavior, 33,* 250-275.

Thank you for your time.

SRS SPORT RESILIENCE SCALE ©

This scale explores how sport performers react to and deal with pressurised situations. There are three parts to the scale:

***Part one* asks about pressures that you may have experienced in the past month.**
***Part two* describes personal qualities and thoughts that you may have displayed when experiencing these pressures.**
***Part three* considers how you might have felt about sport and life in relation to the pressures you have experienced.**

The questions contained within the scale will take about ten minutes to respond to.

To help us understand how sport performers react to and deal with pressure, we would like you to share your experiences with us in an open and honest way. With this in mind, please remember that there are no right or wrong answers to the questions because every performer is different.

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Several questions use the word 'team'. This refers to any of the people in your sport organization, such as managers, coaches, teammates, and support staff. If you represent more than one team in your main sport, please refer to the team that you have competed most frequently for in the past month.

If you understand the nature and purpose of this scale and you consent to complete it, please provide us with the following information before responding to the questions overleaf:

Today: _____ date _____ month _____ year

Name: _____ Age: _____ years _____ months

Gender (circle one): Male Female Nationality: _____

Current main sport: _____

Length of time competing in sport: _____ years _____ months

Current performance status (circle one): Full-time Part-time

Current performance level (circle one):

International	**Senior national**	**Collegiate/University**
State/Regional	**Junior national**	**County**
Club	**Other _____**	

Part One: Pressures

This part consists of questions that ask about pressures that you may have experienced in the past month. For each question, place a tick in one box only to indicate how frequently this pressure placed a demand on you.

	In the past month, I have experienced pressure associated with...	**Frequency**				
		Never	**Sometimes**	**Often**	**Very often**	**Always**
		1	**2**	**3**	**4**	**5**
1.1	The relationship with my coach					
1.2	My family responsibilities					
1.3	A lack of personal finances					
1.4	Others' expectations of my performance					
1.5	A dip in my usual levels of performance					
1.6	My mental preparation for competition					
1.7	My coach's behaviour					
1.8	My performance being evaluated by others in my team					
1.9	Making mistakes during competition					
1.10	My relationship with significant others					
1.11	My travel arrangements for training or competition					
1.12	Not wanting to let others down					

Part Two: Personal Qualities and Thoughts

This part consists of questions that describe personal qualities and thoughts that you may have displayed when experiencing pressures. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
2.1	I enjoyed competing against others					
2.2	If I made a mistake, my confidence was not badly affected					
2.3	I have constantly been looking for better ways to do things in training or competition					
2.4	Negative feedback from others has not affected my levels of confidence					
2.5	I have actively chosen to engage with challenging situations					
2.6	Someone would have showed concern for me if I needed help					
2.7	My sport provided me with an opportunity to be myself					
2.8	My confidence has remained stable					
2.9	I have identified opportunities in the environment to improve my performance in sport					
2.10	Someone would have increased my confidence to deal with pressure if needed					
2.11	Someone would have been there for me if I needed support					
2.12	Other people would have boosted my sense of competence if needed					
2.13	Participation in my sport allowed me to live in a way that was true to my values					
2.14	I have valued the benefits of my sport					

Part Three: Feelings about Sport and Life

This part consists of questions that consider how you might have felt about sport and life in relation to the pressures you have experienced. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
3.1	I felt I have been good at my sport					
3.2	I had a sense of direction and purpose in life					
3.3	I have felt successful at my sport					
3.4	I achieved important things in my life					
3.5	I have been satisfied with my individual performance in my sport					
3.6	I have been satisfied with my life					
3.7	I have had the ability to perform well in my sport					
3.8	I have been satisfied with the improvement of my skill level					
3.9	I have been happy with my life					
3.10	I have been satisfied with the degree to which I have reached my performance goals					

Thank you for completing this scale.

SRS Scoring

Stressors

Performance and Self Presentation Issues: **1.4, 1.5, 1.6, 1.8, 1.9, 1.12**
Coach Issues: **1.1, 1.7**
Personal Commitments and Circumstances: **1.2, 1.3, 1.10**, **1.11**

Protective Factors

Perceived Social Support: **2.6, 2.10, 2.11, 2.12**
Autonomous Values and Beliefs: **2.1, 2.7, 2.13, 2.14**
Robust Confidence: **2.2, 2.4, 2.8**
Proactive Personality: **2.3, 2.5, 2.9**

Positive Adaptation

Perceived Sport Competence: **3.1, 3.3, 3.5, 3.7, 3.8, 3.10**
Hedonic Well-being: **3.2, 3.4, 3.6, 3.9**

Stressors score (1.1-1.12): 60 (12 items x 5)
Protective factors score (2.1-2.14): 70 (14 items x 5)
Positive adaptation score (3.1-3.10): 50 (10 items x 5)

Total score: 180 (36 items x 5)

SPORT RESILIENCE STUDY

Thank you for expressing an interest in our study. The purpose of the research is to explore how sport performers react to and deal with pressurised situations.

The study involves completing two questionnaires contained within this document. There will be specific instructions for completing each questionnaire. The first questionnaire is a little longer and will take about ten minutes to respond to. The second questionnaire is shorter and will take about two minutes in total to complete. **Please ensure that you have set aside enough time to complete the entire document as incomplete questionnaires cannot be used.**

Participation in our study is entirely voluntary. You do not have to take part if you do not want to. If you decide to take part, you may withdraw at any time without giving a reason. Any information obtained in connection with this study will remain confidential. The only people who will have access to the questionnaires will be the researchers listed below based at Loughborough University. In addition, the results of this study will only be published or disclosed to other people in a way that will not identify you.

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Thank you for reading this information sheet. Should you at any time have further questions about participation in this study, please do not hesitate to contact us using the details below.

Kind regards

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If you understand the nature and purpose of this study and you consent to complete it, please provide us with a self-generated ID number below before contiuning:

Self-generated ID number:_____

(E.g., if your initials are MS and you are born on the 22nd, your self-generated ID number would be MS22)

SRS SPORT RESILIENCE SCALE ©

This scale explores how sport performers react to and deal with pressurised situations. There are three parts to the scale:

***Part one* asks about pressures that you may have experienced in the past month.**
***Part two* describes personal qualities and thoughts that you may have displayed when experiencing these pressures.**
***Part three* considers how you might have felt about sport and life in relation to the pressures you have experienced.**

The questions contained within the scale will take about ten minutes to respond to.

To help us understand how sport performers react to and deal with pressure, we would like you to share your experiences with us in an open and honest way. With this in mind, please remember that there are no right or wrong answers to the questions because every performer is different.

Any personally identifiable information that you provide us with will remain confidential. Apart from the researchers, nobody will have access to any of your responses.

Several questions use the word 'team'. This refers to any of the people in your sport organization, such as managers, coaches, teammates, and support staff. If you represent more than one team in your main sport, please refer to the team that you have competed most frequently for in the past month.

If you understand the nature and purpose of this scale and you consent to complete it, please provide us with the following information before responding to the questions overleaf:

Today: _____ date _____ month _____ year

Name: _____ Age: _____ years _____ months

Gender (circle one): Male Female Nationality: _____

Current main sport: _____

Length of time competing in sport: _____ years _____ months

Current performance status (circle one): Full-time Part-time

Current performance level (circle one):

International	**Senior national**	**Collegiate/University**
State/Regional	**Junior national**	**County**
Club	**Other _____**	

Part One: Pressures

This part consists of questions that ask about pressures that you may have experienced in the past month. For each question, place a tick in one box only to indicate how frequently this pressure placed a demand on you.

	In the past month, I have experienced pressure associated with...	**Frequency**				
		Never	**Sometimes**	**Often**	**Very often**	**Always**
		1	**2**	**3**	**4**	**5**
1.1	The relationship with my coach					
1.2	My family responsibilities					
1.3	A lack of personal finances					
1.4	Others' expectations of my performance					
1.5	A dip in my usual levels of performance					
1.6	My mental preparation for competition					
1.7	My coach's behaviour					
1.8	My performance being evaluated by others in my team					
1.9	Making mistakes during competition					
1.10	My relationship with significant others					
1.11	My travel arrangements for training or competition					
1.12	Not wanting to let others down					

Part Two: Personal Qualities and Thoughts

This part consists of questions that describe personal qualities and thoughts that you may have displayed when experiencing pressures. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	**Rating**				
		Strongly disagree	**Disagree**	**Neutral**	**Agree**	**Strongly agree**
		1	**2**	**3**	**4**	**5**
2.1	I enjoyed competing against others					
2.2	If I made a mistake, my confidence was not badly affected					
2.3	I have constantly been looking for better ways to do things in training or competition					
2.4	Negative feedback from others has not affected my levels of confidence					
2.5	I have actively chosen to engage with challenging situations					
2.6	Someone would have showed concern for me if I needed help					
2.7	My sport provided me with an opportunity to be myself					
2.8	My confidence has remained stable					
2.9	I have identified opportunities in the environment to improve my performance in sport					
2.10	Someone would have increased my confidence to deal with pressure if needed					
2.11	Someone would have been there for me if I needed support					
2.12	Other people would have boosted my sense of competence if needed					
2.13	Participation in my sport allowed me to live in a way that was true to my values					
2.14	I have valued the benefits of my sport					

Part Three: Feelings about Sport and Life

This part consists of questions that consider how you might have felt about sport and life in relation to the pressures you have experienced. In relation to the pressures that you identified in Part One, for each of the following questions place a tick in one box only to indicate the extent to which you agree or disagree with the statement.

	In the past month...	Rating				
		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
3.1	I felt I have been good at my sport					
3.2	I had a sense of direction and purpose in life					
3.3	I have felt successful at my sport					
3.4	I achieved important things in my life					
3.5	I have been satisfied with my individual performance in my sport					
3.6	I have been satisfied with my life					
3.7	I have had the ability to perform well in my sport					
3.8	I have been satisfied with the improvement of my skill level					
3.9	I have been happy with my life					
3.10	I have been satisfied with the degree to which I have reached my performance goals					

STRESS APPRAISAL

Please indicate the extent to which each of the adjectives below best describes your perceptions of the pressures that you experienced in the past month. Use the following six point scale (where 0 = not at all to 5 = very much so) and make a response to each adjective.

	In the past month, I found the pressures I experienced to be…	**Rating**					
		Not at all					**Very much so**
		0	**1**	**2**	**3**	**4**	**5**
1	Threatening						
2	Fearful						
3	Enjoyable						
4	Worrying						
5	Hostile						
6	Challenging						
7	Stimulating						
8	Exhilarating						
9	Painful						
10	Depressing						
11	Pitiful						
12	Informative						
13	Exciting						
14	Frightening						
15	Terrifying						
16	Intolerable						