THE SUBJECTIVE WELL-BEING OF PARALYMPIC ATHLETES

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ABSTRACT

Subjective well-being (SWB) is a feeling about one self that is normally positive and chronically stable. It is maintained through homeostatic processes that are employed in the face of stress or threat. Of particular importance are the psychological resources of self-esteem, optimism and the use of coping strategies to maintain stability. While the SWB of people with disabilities is somewhat below that of the general population, very little is known about the SWB of athletes with disabilities and how the context of elite sport influences their psychological functioning. As such, three linked studies have been conducted to explore this topic.

The initial pilot study evaluated athlete SWB in the months before and after the London 2012 Paralympic Games. This sample of Paralympic athletes possessed a level of SWB above the normative population range. Their high level of SWB remained stable in the lead-up to the Games. However, following the conclusion of competition, SWB and psychological resource use decreased, signalling a return to everyday life. This decrease did not support the notion of post-Paralympic depression, but rather indicated a period of post-Paralympic normalisation.

Given the pilot study was conducted before and after a major competition, it was not possible to evaluate the influence of perceived self-performance on SWB. Thus, this was the topic of a second study. During a five-day national team selection camp, elite wheelchair basketball athletes demonstrated SWB stability
despite performance fluctuations. Although a significant relationship was found between perceived performance and SWB, this relationship was mediated by self-esteem. Unsurprisingly, the athletes who viewed their performance more favourably reported significantly higher self-esteem and SWB.

The mediating influence of self-esteem highlights the importance of psychological resources on SWB maintenance. However, sport-specific coping skills, like goal setting, confidence, coping with adversity, freedom from worry, peaking under pressure and coachability, were not previously considered. Thus, a final study documented the relationship between these athletic coping skills and SWB, in the context of national team selection. It was found that athletes who were selected displayed significantly higher levels of athletic coping skills, with the largest differences related to peaking under pressure, goal setting and confidence. However, goal setting was the only psychological skill that significantly increased the odds of being selected to a national wheelchair basketball team.

In summary, elite athletes with disabilities appear to be functioning above the normative SWB range found among the general population. Although a number of factors likely contribute to such high levels of SWB, self-rated performance and psychological skills were identified as important variables. How an athlete perceives their performance has a significant relationship with their self-esteem, which in turn may influence SWB. Psychological resources developed through sport not only appear to facilitate successful performance but also contribute to the resilience of the SWB homeostatic system.
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CHAPTER 1

A REVIEW OF THE LITERATURE

INTRODUCTION

The pursuit of subjective well-being (SWB) has been a fundamental goal of humankind throughout time (Shin & Johnson, 1978). People normally like to feel good and it is logical that human beings benefit from a positive disposition. Possessing such a disposition facilitates the acquisition of resources, the development of social relationships and provides a buffer against depression (Lyubomirsky, Sheldon & Schkade, 2005).

Interestingly, SWB actually is normally positive and remarkably stable (Cummins, Li, Wooden & Stokes, 2014). It is a state that humans continuously attempt to maintain and is thought to be essential for optimal functioning (Ryan & Deci, 2001). One context that is concerned with optimal functioning is elite sport, however, the topic of SWB has received little attention in this context, most particularly in the context of Paralympic sport. Therefore, the purpose of this thesis is to explore the SWB of elite athletes with disabilities in the context of elite sport.

This literature analysis will discuss the cognitive and affective components of SWB and detail its measurement. Evidence demonstrating the
stability of SWB will be provided, and the relevant theories will be explored. Subjective well-being homeostasis theory will then be reviewed in the context of its underlying mechanisms. Literature documenting SWB within a disability context will be explained and, finally, this review will conclude by drawing together the threads of SWB, disability and sport.

**SUBJECTIVE WELL-BEING**

The term SWB has been widely accepted as the generic description of normally positive mood, subjective quality of life and life satisfaction (Cummins, 2005). This overarching descriptor involves affective responses and cognitive evaluations of individual experiences (Campbell, Converse & Rodgers, 1976) and is influenced by personality, goals and expectations (Diener, Suh, Lucas & Smith, 1999). The affective component of SWB involves the combination of affects measuring happiness, contentment and activation (Davern, Cummins & Stokes, 2007). The cognitive component involves judgments of satisfaction across a number of life domains (Cummins, 2000a).

**Components of Subjective Well-being**

Cognitive evaluations are one method employed to evaluate life satisfaction. How individual life domains, like health and relationships, are considered and appraised contribute to the cognitive element of SWB (Cummins, 2000b). Here individuals compare their current life circumstance to a set of self-developed standards (Diener et al., 1999). The perceived distance between the
present moment to several standards of comparisons, such as the past, other people, aspirations and level of attainment, serve to inform the sense of SWB (Michalos, 1985).

Therefore, judgments of life satisfaction are dependent on the discrepancy between current life conditions and some form of standard (Diener et al., 1999). For example, if an athlete won a gold medal and made a comparison to an athlete who finished in last place, there will be a large discrepancy between their current personal circumstances, which may result in enhanced life satisfaction. Although this perspective suggests that cognition exercises control over SWB, recent evidence has demonstrated that the affective component exerts far more influence (Blore, Stokes, Mellor, Firth & Cummins, 2011; Davern et al., 2007).

In addition to the evaluation of life circumstances, SWB is also interpreted through an individual’s mood and emotion, which forms the affective background. As such, it is unsurprising that people in a positive mood reported more happiness and satisfaction with their life when compared to people in a negative mood (Schwarz & Clore, 1983). Affect can be measured as a composite of several items, (Watson, Clark & Tellegen, 1988) or using single items concerning life happiness, for example, “How happy are you with your life as a whole” (Cummins, 2000a).

The evidence documenting the role of affect in SWB has garnered substantial support in the recent literature. It was observed that happiness, contentment and excitement, explained 64% of the variance in SWB (Davern et
al., 2007). These results were confirmed and expanded upon, where structural equation modeling indicated that pure affect, consisting of happiness, contentment and excitement, explained 66% of the variance in SWB (Blore et al., 2011). In conclusion, the evidence suggests that affect plays a dominant role within an individual’s assessment of life satisfaction and as such must be considered when measuring SWB.

**MEASUREMENT OF SUBJECTIVE WELL-BEING**

The most common approaches to the measurement of SWB have centered on the assessment of a single unitary construct, such as life as a whole, or as a composite of discrete domains (Cummins, 1996). A widely accepted method of global SWB measurement consists of a single question, “How do you feel about your life as a whole” with individuals responding to their level life satisfaction/dissatisfaction on a Likert scale (Andrews & Withey, 1976). While this approach has demonstrated to be useful when comparing population data, it only provides a global measure of SWB and is limited when making smaller group comparisons (Cummins, 1996).

More recent models and instruments have attempted to deconstruct SWB into discrete domains. The Personal Well-being Index (PWI; International Well-being Group, 2013) is one such measure that assesses SWB using eight domains of life satisfaction, seven of which contribute to an overall Personal Well-being score (Cummins, Eckersley, Pallant, Van Vugt & Misajon, 2003). Items included in the PWI comprise satisfaction with: standard of living, health, achievement,
personal relationships, safety, community, security, and spirituality, with each making a significant contribution to global life satisfaction (International Well-being Group, 2013).

To evaluate each item, a high level of abstraction is required, thus an individual will draw upon the affective component of SWB to respond (Cummins et al., 2003). This occurs because an individual is unable to apply specific information about their current circumstance when responding to abstract questions. Therefore, it is hypothesised that an individual will reflect on how they are currently feeling to make a conclusion about the level of satisfaction with each general life domain (Cummins et al., 2003; Robinson & Clore, 2002; Schwarz & Strack, 1991).

The measurement of SWB has led to a series of interesting observations. Firstly, it has been observed that SWB is positively skewed, suggesting that it is normal for people to feel good about themselves (Cummins, 2010). This has been illustrated by SWB data assessing the SWB of western and globally representative populations. Here the average SWB scores were reported between 70 to 75 points out of 100, where no life satisfaction is represented by a score of 0 and complete life satisfaction is represented by a score of 100 (Cummins, 1995; 1998). Thus, a score of 75 indicates a level of life satisfaction that is skewed to the positive end of the spectrum. More recent data from Australia also confirm the positive bias in SWB with scores falling between 73.6 to 76.6 points out of 100 (Cummins et al., 2013)
A second observation gleaned from the measurement of SWB is that there appears to be a ceiling and floor effect that keeps SWB within a specific set-point specific range. Using data collected from around the world it was observed that standard deviations for SWB scores were found between 2.5 to 5 points out of 100. This resulted in a normative SWB range between 60 to 80 points of 100 (Cummins, 1995; 1998). Recent longitudinal data further supports this phenomenon where an average set-point range of 71 to 90 points was observed (Cummins et al., 2014). The notion of ceiling and floor effects suggests that a mechanism, akin to homeostasis, operates to maintain SWB within a specific set-point range (Cummins, 1998; Cummins et al., 2014).

A third interesting observation is that SWB demonstrates remarkable stability over time. This phenomenon has been well illustrated by the Australian Unity Well-being Index, which has systematically evaluated the SWB of the Australian population over period of 13 years (Cummins et al., 2013). The findings from these surveys reveal that during this time period mean population SWB has varied by approximately 3 points (73.3 – 76.3) displaying remarkable stability and a normal distribution at an individual level (Cummins, 2010). This steadiness has been further documented in numerous studies assessing both short-term and long-term stability of SWB.

**SUBJECTIVE WELL-BEING STABILITY**

Short-term assessments of SWB have shown remarkable stability across varying time intervals. Correlations between global assessments of SWB
occurring bi-weekly have been reported at .82 and .84 (Pavot & Diener, 1993). Affective measures of SWB also show this stability. For example, test-retest correlations of .83 were found over a period of nine weeks (Bachorowsky & Braaten, 1994). Despite this stability, when considering momentary, situational influences, SWB shows little consistency.

Single occasion, situational assessments have shown that across instances there is little association between ratings of SWB (Diener & Larsen, 1984). For example, SWB scores reported while eating lunch were not related to scores reported while completing household chores. However, when single occasion data are averaged, SWB scores have very high temporal stability across situations. This suggests that single momentary instances SWB will fluctuate over time, but when considered on a chronic basis, SWB remains normally stable (Diener & Larsen, 1984).

Longitudinal studies have also documented the stability of SWB. Correlations ranging from .47 to .63 between SWB scores have been observed over two, four and six year intervals (Costa & McCrae, 1989; Headey & Wearing, 1989). This stability has also been documented in relation to the occurrence of life events. For example, following the occurrence of a good or bad event, SWB was observed to return to baseline levels (Headey & Wearing, 1989). However, the timing of such events is an important factor when considering its influence on SWB. It appears that only recent events have a significant relationship to SWB. But even in such cases changes in SWB are not typically significant or are quickly diminished in less than six months (Suh, Dienter & Fujita, 1996).
The temporal stability of SWB has been further documented by twin studies examining potential genetic influences (Lykken & Tellegen, 1996; Nes, Roysamb, Tambs, Harris & Reichborn-Kjennerud, 2006). The results of a number of studies have shown that genetic influences account for 35 to 50% of the time and environment specific variance in global measures of happiness (Lykken & Tellegen, 1996; Nes, et al., 2006, Schnittker, 2008, Nes, 2010). For example, longitudinal studies have reported cross-time correlations calculated at .85 for men and .78 for women when considering SWB (Nes et al., 2006). Additional genetic modeling of 2,157 twins from the Netherlands has also shown that additive genetic influences accounted for approximately 40 to 50% of the variance across four different measures of SWB (Bartels & Boomsma, 2009).

Consistent with previous findings, individual environmental influences were shown to have a significant effect at specific time instances but did not exert long lasting effects on SWB (Nes et al., 2006). These data suggest that environment or life events may cause SWB to shift above or below a baseline level but in the long-term, SWB and affect is largely determined by a genetic predisposition (Lykken & Tellegen, 1996; Nes et al., 2006).

**SUBJECTIVE WELL-BEING THEORY**

A number of theories have been developed in an attempt to understand the positive, stable nature of SWB. One such model is dynamic equilibrium (Headey & Wearing, 1989). This approach suggests that each person has a set equilibrium of SWB, which in the absence of major life events remains constant. If a person
experiences a deviation from normal life events then SWB will change. However, over time SWB will return to normal levels because it is based on genetically stable personality traits (Headey & Wearing, 1989). The propensity model (Kozma, Stone & Stones, 2000) also described SWB as a dispositional-based system that involves a self-adjusting process to maintain stability around predetermined set-points. According to this model, this personality trait based system maintains SWB despite changes in the environment (Kozma et al., 2000).

What is consistent across these two theories is the idea that SWB reflects an enduring temperament and personality (Diener & Lucas, 1999; Steel, Schmidt & Shultz, 2008). A recent meta-analysis demonstrated the total variance of SWB accounted for by personality was found to be as high as 39 % and 63 % (Steel et al., 2008). Amongst personality traits, extroversion and neuroticism have consistently been related to SWB (Diener & Lucas, 1999). Individuals who are extroverts tend to have more positive feelings and experience them more powerfully than introverts (Diener & Biswas-Diener, 2008). Neuroticism on the other hand has been considered the strongest predictor of lower SWB, and increased negative affect.

Although these personality driven models suggest that SWB is maintained through a genetic neurological system, they are unable to completely explain the stability of SWB and its relationship to other psychological variables (Cummins, 2010). Despite numerous researchers suggesting that hereditable personality traits account for the stability of SWB (Diener & Lucas, 1999; Steel et al., 2008) recent
evidence suggests that personality may have less of an influence on SWB than previously thought (Davern et al., 2007; Blore et al., 2011).

**Homeostasis Theory**

Homeostasis theory (Cummins, 2010) posits that SWB is managed by a genetic neurological system, similar to the physiological management of internal body states. Like body temperature, there is a set-point range of SWB, originally estimated as 70 to 80 points on a 0 to 100 point range (Cummins, 1995; 1998). The normal distribution of set-points has more recently been estimated as between 70 – 90 points (Cummins et al., 2014). It is proposed that it is this set-point range, which forms a critical threshold that the homeostatic system actively attempts to conserve.

Under a condition of zero threat, SWB will be kept close to its predetermined set-point (Cummins, 2010), which averages at 80 points (Cummins et al., 2014). If an individual experiences mild forms of positive or negative life events, the level of SWB will fluctuate within its set-point range, which translates into approximately nine percentage points on either side of an individual’s set-point. Therefore, in an environment where positive events occur frequently SWB will average within the top segment of the set-point range. Conversely, in an environment comprised of recurrent negative events SWB will average within the bottom segment. Over time and in the absence of overwhelming negative stimuli the homeostatic system will function to re-establish levels of SWB to its set-point (Cummins, 2010; Headey & Wearing, 1989; Suh et al., 1996).
As threats to the homeostatic system become stronger, so do its defenses in an effort to maintain stable levels of SWB. The system will endeavor to prevent SWB from falling below its lower normal average limit of approximately 70 points (Cummins et al., 2003). Thus, SWB will remain steady at as long as the homeostatic system is effective. However, all homeostatic systems have a tipping point where they are no longer able to function sufficiently. Once a threat or challenge becomes too strong for the defenses, the homeostatic system will be overwhelmed and SWB will fall (Cummins, 2010).

Evidence for the significant reduction in SWB due to chronic and overwhelming challenges have been observed in individuals who provide informal care to family members with various types of disabilities. Here, informal carers not only report clinically significant levels of stress but also the lowest level of SWB found in the Australian population. Unsurprisingly, the majority of these individuals also experience severe to extremely severe symptoms of depression (Hammond, Weinberg & Cummins, 2014).

**MECHANISMS OF HOMEOSTASIS**

As the theory suggests, when the homeostatic system is challenged by threat or distress it defends itself and endeavors to keep levels of SWB within set-point range. As SWB approaches threshold, a series of external and psychological resources are employed to ensure homeostasis is sustained (Cummins & Nistico, 2002; Cummins & Wooden, 2014).
**External Resources**

The two major forms of external resources identified are wealth and relationships (Cummins, 2010). The power of wealth lies in its capacity to be used as a flexible resource to aid in the maintenance of homeostasis (Cummins, 2000a). This financial resource enables people to exercise more personal control and to reduce unwanted challenges experienced in daily life (Dunn, Gilbert & Wilson, 2011).

A second external resource is a meaningful, supportive relationship (Cummins, 2010). The positive effects of social support on SWB as a form of protection from stress and negative life events has been well documented (Cohen & Wills, 1985; Sarason, Sarason & Pierce, 1990). Individuals who have close relationships with people that provide supportive resources have a higher level of SWB when compared to those with fewer supportive relationships (Mitchell, Billings & Moos, 1982). Further evidence is documented in the results from the Australian Unity Well-being Index, which indicates that individuals living with a partner or a partner and children demonstrate higher levels of SWB than single parents or single individuals (Cummins, Woerner, Gibson, Weinberg, Collard & Chester, 2009).

**Internal Resources**

When external resources are unable to provide relief from negative life events, a set of internal psychological recourses are employed. At a basic level,
these resources involve adaptation and habituation, to diminish both positive and negative experiences (Cummins, 2010). For example, individuals who have acquired a physical disability later in life initially display diminished SWB. However, over time they adapt to their new circumstance and SWB approximates baseline levels (Brickman, Coates & Janoff-Bulman, 1978; Oswald & Powdthavee, 2008).

The methods by which these cognitive processes act to maintain SWB homeostasis are highly varied, but appear to be based on the maintenance of positive self-perceptions that result in life satisfaction. In essence these psychological resources are positive cognitive biases that contribute to adaptation and the maintenance of SWB (Cummins & Nistico, 2002; Cummins & Wooden, 2014). Three psychological resources consisting of self-esteem, optimism and perceived control have been consistently related to SWB (Taylor & Brown, 1988).

Self-esteem is the extent an individual values or approves him or herself and possesses feelings of self-worth or adequacy as a person (Lyubomirsky, Tkach & Dimatteo, 2006). Widespread support can be found documenting the affirmative effects of a positive self-perception on SWB (Richardson, Ratner & Zumbo, 2009). Possessing feelings of self-worth have been shown to buffer the effect of anxiety provoking stimuli (Pyszczynski, Greenberg, Solomon, Amdt & Schimel, 2004) and those with high levels of self-esteem experience less emotional distress in response to failures (Dutton & Brown, 1997). Thus, self-
esteem has been shown to predict levels of happiness and depression (Cheng & Furnham, 2003).

Optimism can be described as the tendency for an individual to believe that in general they will experience good rather than bad outcomes in life (Scheier & Carver, 1985). Possessing a positive belief about one’s future has been associated with numerous health benefits (Carver, Scheier & Segerstrom, 2010; Diener & Chan, 2011) and shares a significant relationship with SWB (Carver et al., 2010; Daukantaitė & Zukauskiene, 2012). Possessing a positively skewed outlook also appears to provide a buffer from distress. For example, individuals with high optimism report lower levels of distress when faced with surgery (Fitzgerald, Tennen, Affleck & Pransky, 1993) and less distress during the school semester (Aspinwall & Taylor, 1992). Clearly holding a positive belief about the outcome of one’s future either within daily life or in the face of adversity is important to maintain a sense of SWB (Cummins & Nistico, 2002; Cummins & Wooden, 2014).

Coping strategies derived from perceived control form another psychological resource that plays an important role in the maintenance of SWB. From this perspective primary and secondary control serve as a strategies to cope with adversity and sustain competencies and motivation (Schulz & Heckhausen, 1996).

Primary control involves an individual attempting to actively change their world so that it suits their needs (Rothbaum, Weisz & Snyder, 1982). Here, an
individual exhibits approach coping in the form of cognitive and behavioural strategies to actively address the stressor (Litman, 2006; Roth & Cohen, 1986). Secondary control involves attempts to accommodate to the demands of the environment (Rothbaum et al., 1982). In this scenario an individual exhibits avoidance coping, by attempting to reduce distress and restructure cognition to accommodation to the challenge (Litman, 2006; Roth & Cohen, 1986).

The application of either approach or avoidance coping strategies can vary in primacy and can also occur simultaneously. Although coping strategies can be influenced by situational demands, individuals may have consistent preferences in how they adapt to environmental challenges (Roth & Cohen, 1986). Despite the potential benefits of each strategy, the majority of the literature favours the application of approaching coping to foster SWB. Pursuing approach strategies has been found to facilitate a positive sense of SWB by motivating individuals towards positive stimuli and desired outcomes (Carver, Sutton & Scheier, 2000; Elliot, 2008). On the other hand, avoidance strategies have been found to negatively affect mood, competence, personal control and life satisfaction (Elliot, Thrash & Murayama, 2011; Van Dijk, Seger-Guttamnn & Heller, 2013).

Clearly there are a variety of external and internal resources that can be employed to defend the homeostatic system and maintain a positive sense of SWB. It is important to note that all of these resources are highly personalized. They are concerned with preserving core feelings that can be described as positive cognitive biases. Therefore, it appears that the fundamental purpose of these
HOMEOSTATIC PROTECTED MOOD

Central to the theory of SWB homeostasis is the concept that each individual has a biologically predetermined set-point range at approximately 75 points out of 100 (Cummins et al., 2003). Until recently, personality was thought to account for the stability exhibited in SWB (Diener & Biswas-Diener, 2008; Diener & Lucas, 1999; Steel et al., 2008). However recent findings have demonstrated that personality and cognition exert less influence on SWB than once previously thought. It has now been suggested that mood exerts a primary influence on SWB (Blore et al., 2011; Davern et al., 2007).

A series of studies examining relative influences on SWB have highlighted the importance of affect. Three affects consisting of happiness, contentment and excitement were found to collectively account for 64% to 66% of the variance in SWB (Blore et al., 2011; Davern et al., 2007). This group of affects was then evaluated against cognition and personality to determined the relative influence of each component on SWB. The results indicated that an affective model accounted for 90% of the variance in SWB, while cognition and personality made little to no significant contributions, respectively (Blore et al., 2011; Davern et al., 2007).

homeostatic defences may be directed at the preservation of core mood (Cummins, 2010).
Based on the significant relationship between affect and SWB, it was suggested that happiness, contentment and excitement reflect a mood state underlying SWB. Within SWB homeostasis theory, this has been described as Homeostatic Protected Mood (HPMood) and can be characterised as a biologically determined positive mood that comprises the most basic experienced feeling (Russell, 2003). It is hard-wired for each individual, comprising an affective state that provides the activation energy or motivation, for behavior (Cummins, 2010).

Within this view, it suggested that SWB represents an approximation of HPMood. This ubiquitous mood state is held within a genetically predetermined set-point range that the homeostatic system acts to defend using various internal and external resources (Cummins & Wooden, 2014). Over time the process of adaptation will return the affective experience back to HPMood. However, when homeostasis is chronically overwhelmed the affective experience shifts to the dominant emotion. In aversive circumstances negative affect becomes dominant and the loss HPMood forms the essence of major depression (Cummins, 2010).

SUBJECTIVE WELL-BEING AND PHYSICAL DISABILITY

Subjective well-being homeostasis has also been studied among individuals with physical disabilities. It is often assumed that a person with a physical disability (PD) must have a poor level of health and possess low levels of life satisfaction (Brown, Brown & Bayer, 1994). In actuality, people with PDs frequently possess a positive perception of their health and life satisfaction that is
discordant with an objective assessment of their disability (Albrecht & Devlieger, 1999).

The literature examining the SWB of individuals with various types of PDs indicate they experience a similar or somewhat lower level of SWB when compared to the able-bodied general population (Albrecht & Devlieger, 1999; Chow, Kai Lo & Cummins, 2005; Emerson, Honey, Madden & Llewellyn, 2009; Post, Van Dijk, Van Asbeck & Schrijvers, 1998). Based on the available data, two important observations should be noted. Firstly, the data suggest that ratings of SWB among people with PDs are positively skewed. Although some findings highlight that these ratings are somewhat below general population norms, on average SWB scores are found in the positive half of the satisfied – dissatisfied continuum (Dijkers, 1997; Post et al., 1998).

A second observation is that subjective ratings show little relationship to objective ratings of quality of life (Albrecht & Devlieger, 1999; Chow et al., 2005). Together these observations suggest a mechanism, like homeostasis, may be responsible for maintaining a generally positive sense of SWB, despite the objective effects of a disability (Chow et al., 2005).

**Homeostasis and Physical Disability**

Evidence for homeostasis theory is further highlighted when considering the implications of factors related to PD and ratings of SWB. These factors include the severity of disability (Lucas, 2007a; Mehnert, Krauss, Nadler & Boyd,
1990; Uppal, 2006) the time of disability onset (Oswald & Pwdthavee, 2008; Uppal, 2006) and support resources (Emerson et al., 2009).

One important factor to consider is the severity of disability. In general, as the severity increases, SWB is observed to decrease (Lucas, 2007b; Uppal, 2006). For example, an individual who was 75% disabled experienced a much larger decrease in SWB when compared to someone who was 25% disabled (Lucas, 2007b). It is hypothesised that this may be due to activity limitations and associated hardships, like poor standard of living associated with severe PD (Emerson et al., 2009; Mehnert et al., 1990).

Consistent with homeostasis theory, this would suggest that as life circumstances become so poor, the challenge to homeostasis becomes too great and as such SWB falls below its normal range, (Cummins, 2000b; 2005). However, when high levels of emotional/ social resources exist to buffer difficult life circumstances SWB remains normal (Emerson et al., 2009). Thus, if resources can meet the demands of challenges associated with disability, a positive sense of SWB will be maintained (Cummins & Wooden, 2014).

It has also been observed that ratings of life satisfaction are significantly related to the age of disability onset (Mehnert et al., 1990). Individuals who become disabled later in life display lower levels of SWB when compared to individuals who acquired their PD early in life (Mehnert et al., 1990; Uppal, 2006). To account for these differences, researchers have suggested that individuals who acquired their disability early on in life have more time to
accommodate to their new life situation (Krause & Sternberg, 1997; Uppal, 2006). Although the severity of the disability has been shown to affect the level of adaptation that occurs (Oswald & Pwdthavee, 2008), these findings lend support to the idea that a homeostatic process drives the process of SWB adaptation.

In summary, this literature has shown that despite poorer objective life circumstances people with disabilities report levels of SWB no different or slightly below that of the general population. Thus, the fact that SWB is stable and appears to adapt in the face of negative objective life conditions provides considerable evidence for the internal homeostatic process that actively manages SWB (Cummins, 2010).

Disability and Sport

As previously discussed, extensive research has been undertaken to assess and understand what contributes the primarily positive sense of SWB possessed by people with physical disabilities. (Chow, et al., 2005). However, very little research has been conducted to examine the SWB of highly functioning, elite athletes with PDs. Given that SWB and the homeostatic mechanisms that maintain it are thought to contribute to optimal functioning (Cummins, 2010; Ryan & Deci, 2001) it would be logical that these athletes would possess a high level of SWB.

Only recently have researchers published information about the psychology of athletes with PDs (Hanrahan, 2007). Preliminary analyses suggest
that these athletes appear more comparable to highly functioning individuals from
the able-bodied general population. They report more positive affect than
negative affect (Martin, 2008), fewer symptoms of depression and anxiety,
(Greenwood, Dzewaltowski & French, 1990; Martin, Malone & Hilyer, 2011),
and increased general life satisfaction (Campbell & Jones, 1994; Greenwood et
al., 1990).

Although these descriptive studies provide interesting results, determining
what facilitates this positive sense of SWB requires the careful consideration of a
number of factors. This not only includes satisfaction with specific life domains
but also psychological resources (Cummins & Nistico, 2002) and the influence of
sport-specific factors like competition, perceived performance and psychological
skill use. All such variables would likely play an important role in athlete SWB
and should be accounted for.

CONCLUSIONS

Subjective well-being is a feeling about one self that is normally positive
and chronically stable. It is maintained through homeostatic processes that are
employed in the face of stress or threat. Of particular importance are the
psychological resources of self-esteem, optimism and the use of coping strategies
to maintain stability. Although the SWB of people with disabilities is similar to
that of the able-bodied general population, very little is known about the SWB of
elite athletes with disabilities and how the context of elite sport influences their
psychological functioning. As such, three linked studies have been conducted to
explore this topic, within the context of homeostasis theory. What follows is the
first pilot study designed to evaluated athlete SWB in the months before and after the London 2012 Paralympic Games.
CHAPTER 2

THE SUBJECTIVE WELL-BEING OF PARALYMPIC
ATHLETES: A PILOT STUDY

INTRODUCTION

As discussed in the previous chapter, subjective well-being (SWB) is a phenomenon that encompasses positive affect and life satisfaction, where judgments are made on a global level or as an aggregate across a number of life domains (Andrews & Withey, 1976; Campbell et al, 1976; Cummins, 2000b; Diener & Larsen, 1984). These judgments are largely driven by a core mood that mainly comprises happiness, contentment and activation (Bloore, et al., 2011; Davern et al., 2007).

Extensive measurement has revealed that SWB is normally positive, remarkably stable, and is largely determined by a genetic predisposition (Lykken & Tellegen, 1996; Nes et al., 2006), which establishes a set-point range that strives to be maintained when challenged by both positive and negative environmental events (Cummins, 2010; Cummins et al., 2014). However, some factors produce deviations in experienced affect from this set-point.

One factor that has potential to increase SWB is engagement in moderate levels of physical exercise (Cummins, Woerner, Gibson, Lai, Weinberg & Collard, 2008). Though extreme levels of physical activity can have a number of
adverse health effects, people who engage in this behaviour at light to moderate levels often report higher levels of life satisfaction when compared to non-exercisers (Melin, Fugl-Meyer, & Fugl-Meyer, 2003; Valois, Zullig, Huebner, & Drane, 2004).

However, even among people who are physically active, SWB can be raised above the set-point range by increasing the intensity and frequency of exercise, up to a point (Cummins, et al., 2008). Once exercise becomes exhaustive and consumes a significant portion of one's life, such benefits are no longer observed (Cummins, et al., 2008).

The effect of exercise on SWB may be partially due to the mood enhancing effects of exercise (Reid, Buck, 2009; Reid & Ones, 2006), the real power of exercise is likely tied to its stress buffering effect (Gerber, Kellmann, Hartmann, & Pühse, 2010; Klaperski, von Dawans, Heinrichs, & Fuchs, 2012; Rueggeberg, Wrosch, & Miller, 2012). Improving the ability to adapt and withstand potential stressors helps to counteract the negative effects of ongoing environmental influences, enabling the maintenance of a positive sense of SWB within the set-point range (Cummins & Wooden, 2014).

Conversely, other situations present significant challenges that make it more difficult to maintain a stable and positive sense of SWB. An extensive literature confirms that individuals who have various types of physical disabilities report lower levels of SWB when compared to people without disabilities.
The timing of disability onset and the severity of impairment also influence disparity from the normative range. Acquiring a disability later in life or having a disability that leads to severe impairment are typically associated with lower levels of SWB (Lucas, 2007; Mehnert et al., 1990; Uppal, 2006). As a result, these two factors, time of onset and severity of disability, present challenges that make adaptation to life circumstances quite difficult (Krause & Sternberg, 1997; Mehnert et al., 1990; Uppal, 2006). Thus, the inability to adapt and cope with such challenges would negatively affect SWB (Cummins & Wooden, 2014).

The effects of exercise and disability have different implications for each individual, but one situation where both interact is the area of elite disability sport, such as the Paralympics. However, little information exists in regards to the SWB of highly functioning elite athletes with disabilities.

Descriptive analyses suggest that this athlete group appear more comparable to highly functioning individuals from the able-bodied general population. For instance, athletes with a disability report more positive affect than negative affect (Martin, 2008), fewer symptoms of depression and anxiety, (Greenwood et al., 1990; Martin et al., 2011), and increased general life satisfaction (Campbell & Jones, 1994) when compared to sedentary individuals.
(Campbell & Jones, 1994; Greenwood et al., 1990) and less skilled athletes with
disabilities (Campbell & Jones, 1994; Martin et al., 2011).

Although these findings outline some of the psychological benefits
associated with engagement in elite disability sport, further research is required to
understand the SWB of elite athletes with disabilities. There are two reasons for
this. First, none of the aforementioned studies actually measured SWB of
Paralympic athletes or made comparisons to population norms. Second, there are
a number of important factors related to the maintenance of SWB, and to a life as
elite athlete. Thus, such factors should be accounted for.

Determining what facilitates a positive sense of SWB involves not only
satisfaction with specific life domains but also the availability of psychological
resources such as optimism, self-esteem and coping strategies (Cummins &
Nistico, 2002). The use of these psychological resources assists individuals to
adapt and habituate to challenges that may affect SWB (Cummins, 2010). Such
processes have been associated with personal control, positive affect and the
ability to cope with adversity (Lyubomirsky et al., 2005; Veenhoven, 2008).

In addition to the maintenance of SWB, these psychological resources also
play an important role in the performance of elite athletes. Positive self-regard,
optimism, and approach coping strategies have been associated with resilience
and mental toughness among athletes (Jones, Hanton & Connaughton, 2007;
Nicholls, Polman, Levy & Backhouse, 2008). In turn these factors have been
shown to facilitate sport performance, distinguishing between successful and less
successful athletes (Jones, Meijen, McCarthy & Sheffield, 2009; Martin, 2008; Nicholls, Polman, Levy; 2012; Nicholls et al., 2008).

Beyond psychological resources, another important consideration when measuring SWB is related to the occurrence of major competitions. Participation in an event like the Paralympic Games represents the pinnacle of elite sport and can be an incredibly challenging, yet rewarding experience (Gould & Maynard, 2009). Fluctuations in SWB are often attributable to the effects of positive and negative life events (Boswell, Boudreau & Tichy, 2005; Brickman, et al., 1978; Lucas & Clark, 2006; Nawijn, Marchand, Veenhoven & Vingerhoets, 2010) and would be expected to occur in relation to such periods.

In the lead up to competition, athletes would likely experience a substantial sense of excitement and anticipation. They are recognized by the community (Ellis, 2009) and receive considerable support to ensure they are able to deliver their best performances (Greenleaf, Gould & Dieffenbach, 2001; Sotiriadou & Shilbury, 2009). Thus, it is not surprising that athletes have been shown to become significantly less self-critical and anxious when compared to baseline measures (Henschen, Horvat & Roswal, 1992).

In the period following the conclusion of a major competition a number of anecdotal reports have suggested the presence of a phenomenon called “post-Olympic depression” (Gahwiler, 2007; Gordin & Henschen, 2012; McCann, 2000). This period of letdown or emptiness following the achievement or failure
to achieve a goal is characterized by depression and negative affect (Gordin & Henschen, 2012).

In summary, a number of factors must be considered to reliably assess the SWB of Paralympic athletes. These include the use of psychological resources like, self-esteem, optimism and coping strategies, and the timing of competition. Therefore, the present study addresses two primary objectives. The first is to measure the SWB of Paralympic athletes compared to normative values of the general Australian population. The second is to monitor the trajectory of SWB in the lead up to and conclusion of competition. Based on these objectives four hypotheses have been developed as follows:

1. At initial measurement, Paralympic athletes will possess higher levels of SWB when compared to normative values.

2. SWB will remain consistent across initial measurement, pre-competition and post-competition phases, demonstrating homeostatic maintenance.

3. Operating levels of psychological resources related to SWB maintenance will increase in the lead up to competition at the London 2012 Paralympic Games, demonstrating the homeostatic principles of SWB.

4. Following the conclusion of competition, a normalising process will be observed where psychological resources and symptoms of depression will return to initial levels.
METHOD

Human Ethics and Organisational Approval

This study was approved by the Deakin University Human Ethics Research Committee (reference number 2011-149).

Following the receipt of ethics approval, research proposals were submitted to the International Paralympic Committee’s Medical and Scientific Department and a national Paralympic Committee. This was a necessary step to initiate contact with the sport governing bodies to gain authorization to conduct research with athletes competing at the London 2012 Paralympic Games. Following a panel review, the research proposal was approved by both groups. A formal agreement was then developed between the principal investigator and a national Paralympic Committee to establish conditions of participation and project procedures.

Participants

Initially it was projected that all 175 athletes of a 2012 Paralympic team would participate in the study. However, due to organisational concerns about the potential for the study to interfere with athlete preparation in the lead up to Paralympic competition, the initial agreement was negated. The project was then modified as a pilot study with a small sample comprising seven members of a 2012 Paralympic team.
The participants were three male and four female athletes between the ages of 24 and 57 years ($M = 39.28$, $SD = 13.54$). They represented six different sport disciplines, including athletics, cycling, goalball, sailing, shooting, and wheelchair rugby. A portion of athletes (42.9%) spent approximately 10 to 15 hours per week engaged in sport-specific training. All athletes had a form of physical disability and represented seven different classifications (International Paralympic Committee, 2014). Two athletes indicated that their disability was present from birth and five that their disability acquired later in life. Details of these demographic characteristics are presented in Table 1.1.

**Table 1.1**

*Participant Demographics*

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>3</td>
<td>42.9</td>
</tr>
<tr>
<td>Female</td>
<td>4</td>
<td>57.1</td>
</tr>
<tr>
<td>Disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congenital</td>
<td>2</td>
<td>28.6</td>
</tr>
<tr>
<td>Acquired</td>
<td>5</td>
<td>72.4</td>
</tr>
<tr>
<td>Training Hours per week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-9</td>
<td>1</td>
<td>14.3</td>
</tr>
<tr>
<td>10-15</td>
<td>3</td>
<td>42.9</td>
</tr>
<tr>
<td>16-20</td>
<td>1</td>
<td>14.3</td>
</tr>
<tr>
<td>21+</td>
<td>2</td>
<td>28.6</td>
</tr>
</tbody>
</table>

**Procedure**

An informational letter was produced in collaboration with the principal psychologist for the Paralympic team. This letter was sent to the head coaches of the team inviting their athletes to participate in the research study. If agreed upon,
the coaches provided their endorsement for the study and their athletes were then emailed an invitation to participate.

Included in the invitation was a link to the study website. If athletes were interested in participating, they selected the web-link and provided their informed consent. The athletes were then asked to provide demographic information and to complete measures of SWB, Homeostatically Protected Mood (HPMood), approach-avoidant coping, self-esteem, optimism and symptoms of depression. The items were produced in a web-based format, which enabled the athletes to complete the assessments at home or while overseas. The questionnaire took approximately 15 minutes to complete.

A repeated measures design was employed to evaluate changes in SWB over a five-month period coinciding with the 2012 London Paralympic Games. Participants completed the assessments at three time periods; three months prior to the Paralympic Games, one week prior to the start of competition and one month following the conclusion of competition.

Following the initial data collection period, participants were contacted by email to prompt them to complete the second assessment prior to the start of competition and the final follow up assessment at one month post-competition. Following each data collection period, the principal psychologist for the team was provided with a brief SWB report for each athlete. This report identified athletes who indicated they were experiencing increased symptoms of depression, enabling the principal psychologist to follow up as required with the athlete.
Measures

The Personal Well-being Index-Adult version (PWI; International Well-being Group, 2013) was used to measure SWB. The PWI is a seven-item domain-based measure evaluating satisfaction with: standard of living, health, achieving in life, relationships, safety, community connectedness and future security. Respondents use an 11-point end-defined scale (Jones & Thurstone, 1955) with anchors of (0) completely dissatisfied, to (10) completely satisfied for all ratings. Domain scores are averaged to yield SWB and all results are converted to a percentage point score from zero to 100 (International Well-being Group, 2013). The PWI displays high internal consistency (α = .70 to .85) and test-retest reliability over a two-week period has been reported as .84 (Cummins & Lau, 2005).

Homeostatic Protected Mood (HPMood) is measured by asking individuals how happy, content and alert they generally feel. Each item is rated on an end defined 11-point scale from 0 (not at all) to 10 (extremely). Responses are then averaged to produce an overall HPMood score. The adjectives happy, content and alert, have been found to account for 66% of the variance in SWB and best describe the most basic core affect that is HPMood (Blore et al., 2011; Davern et al., 2007). This scale has demonstrated good internal consistency with Cronbach’s alpha coefficients of .82 (Ayers, 2011).

To measure approach and avoidance coping, an 11-item coping with life scale was employed, which was based on Cousin’s (2002) conceptualisation.
Participants were prompted with the statement “how much do you agree when something bad happens” and then rated items on an 11-point scale ranging from 0 (do not at all agree) to 10 (agree completely).

The approach coping subscale comprises six primary control items, such as “I work hard to overcome it,” and the avoidance control subscale was made up of five secondary control items, including “I ignore it by thinking about other things”. Responses were then summed to produce an overall score for each scale. The approach and avoidance coping subscales have demonstrated good internal consistency with Cronbach’s alpha coefficients of .87 and .76 respectively (Ayers, 2011).

The three positively worded items from the Life Orientation Test-Revised (Scheier, Carver & Bridges, 1994; LOT-R) were used to measure the degree of optimism. The remaining scale items were not utilised due to evidence of bi-dimensionality when the pessimism items are used (Chan, Maydeu-Olivares & D’Zurilla, 1997). Items such as “I usually expect the best,” are rated on an 11-point end defined scale ranging from 0 (strongly disagree) to 10 (strongly agree). Responses are then summed together to yield a total score of optimism. The revised scale has demonstrated good internal reliability (Cronbach’s $\alpha = .89$; Tomyn, 2008).

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) is a 10-item scale that has been extensively used to examine self-esteem. Participants rated how much they disagree (0) or agree (10) with items on an 11-point end defined scale.
Responses were then added to form an overall score for self-esteem. Only the positively worded items were utilised in the present study to assess self-esteem. These items were selected based on evidence that suggests a bi-dimensional view of self-esteem such that the positive and negative subscales have been shown to measure different phenomenon (Martin, Thompson & Chan, 2006). Additionally, the negative subscales have been reported as less effective in differentiating people with high or low self-esteem (Gray-Little, Williams & Hancock, 1997; Marsh, 1996). Overall, this scale demonstrates good internal consistency (Cronbach’s $\alpha = .73$; Rosenberg, 1965).

Self-reported symptoms of depression were assessed using the Depression, Anxiety and Stress Scale (DASS), which have demonstrated sound psychometric properties. Cronbach’s alpha values for the subscales range from .84 to .91 (Lovibond & Lovibond, 1995). Only the depression subscales were included for the present study.

Items are normally rated on a four-point scale however, respondents used an 11-point scale ranging from (0) did not apply, to (10) applied a lot. The 11-point scale was adopted based on research suggesting increasing response options in this way enhances scale sensitivity without systematically compromising scale reliability (Cummins & Gullone, 2000). Depression cut off scores provided by the manual were recalculated and reflect normal (0-21), mild (22-31), moderate (32-48), severe (49-64) and extremely severe (65+) symptoms.
Data Analyses

Prior to analyses, the data were checked for acquiescent responses, as recommended by the PWI manual (International Well-being Group, 2013). As a consequence, two respondents were eliminated due to consistent PWI ratings of 10 across all seven domains. Such a pattern of answering is indicative of respondents who fail to understand the task or are unwilling to provide valid data. Following this procedure, valid data was available for only seven participants at the initial measurement phase, five participants during the pre-competition phase and six participants during the post-competition phase.

Following this elimination process, all items were converted to percentage scale maximum scores (%SM). The conversion creates a standard 0-100 point metric from any response scale and the formula for this conversion is provided in the PWI manual. When the response scale is 0 to 10, the conversion is achieved by shifting the decimal point one place to the right. For example, a score of 7 on a 0 to 10 scale becomes 70 points. This procedure ensures a standardized presentation format for response scores.

Due to the exploratory nature of the study and the restraints of such a small sample size, the data were analysed using descriptive and visual analyses, as well as non-parametric tests. All analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM, 2012). To evaluate athlete PWI scores at initial measurement, visual comparisons were made with normative population values from AUWI Survey 28 (Cummins et al., 2012) to
determine whether descriptive differences could be observed. Pearson correlation coefficients were used to examine relationships between variables. To assess for potential changes in SWB between the pre and post competition phases, descriptive visual analyses were employed.

To test for differences in HPMood, self-esteem, optimism, control and symptoms of depression between Paralympians and the able-bodied general population, seven participants were selected from Australian Unity Well-being Index Longitudinal Survey (Cummins & Weinberg, 2014). To form the comparison group, participants were matched based on age and gender, and full-time employment or study status, to closely approximate the demographic variables of the Paralympic athletes.

These variables were selected because a number of studies have documented the effects of such demographic variables on SWB. For example, women generally report higher SWB (Blanchflower & Oswald, 2004); the effect of age on SWB has been observed to demonstrate a U-shaped relationship, with younger and older adults reporting more satisfaction with life (Easterlin, 2006); and unemployment can negatively affect SWB (Lelkes, 2006). Once a matched comparison group for each participant was identified, an individual was then selected from that matched group at random, using the random case selection function of SPSS.
RESULTS

Initial measurement of the dependent variables occurred approximately three months prior to the start of competition at the London 2012 Paralympic Games. Table 1.2 has been prepared to display the mean scores and inter-item correlations for each dependent variable.

Table 1.2

Correlations, means and standard deviations of all dependent variables (n = 7)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SWB</td>
<td>.41</td>
<td>-.05</td>
<td>.03</td>
<td>.52</td>
<td>.34</td>
<td>-.11</td>
<td></td>
</tr>
<tr>
<td>2. HPMood</td>
<td>.73</td>
<td>.85</td>
<td>.94</td>
<td>.69</td>
<td>-.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Optimism</td>
<td>.93</td>
<td>.75</td>
<td>.47</td>
<td>-.56</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Self-Esteem</td>
<td>.86</td>
<td>.44</td>
<td>-.32</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Approach Coping</td>
<td>.54</td>
<td>-.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Avoidance Coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Depression</td>
<td>--</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean 78.97 79.05 64.76 75.43 76.19 51.43 17.75

a Correlation is significant at the 0.01 level (2-tailed)
b Correlation is significant at the 0.05 level (2-tailed)

As expected, results showed that a number of strong associations were found between several variables. These involved strong positive correlations between HPMood, self-esteem and approach coping. However, it was unexpected that much weaker and non-significant correlations were found between SWB, HPMood, optimism, self-esteem and coping.
Initial Comparison

The first hypothesis proposed that Paralympians would display higher SWB scores when compared to the general population. To test this assertion data collected during the initial phase of the study was compared to values obtained from the general population. Figure 1.1 displays the mean scores for each group. The vertical arrows illustrate the normative range found in the general population reported in AUWI Survey 28 (Cummins et al., 2012). The strength of satisfaction for each domain, reported on average by the Paralympic athletes are identified by the marker.

Figure 1.1 – Average Paralympic athlete SWB compared to normative ranges found in the general population.

Figure 1.1 is interesting in several respects. First, as hypothesised, SWB scores were observed to be higher for the Paralympic group when compared to the general population. Although four of the domains are also considerably higher than norms, two domains (standard and health) are within-range. Most anomalous, the remaining domain, satisfaction with personal relationships, is approximately 10 points below the values reported by the general population.
Due to the lack of normative population data for the other psychological variables, seven matched individuals from the able-bodied general population served as a comparison group. The mean scores and standard deviations of each variable are presented in Table 1.3.

Table 1.3

A comparison of psychological variables related to SWB between Paralympians and the general population

<table>
<thead>
<tr>
<th>Variable</th>
<th>Paralympians ((n = 7))</th>
<th>General Population ((n = 7))</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWB</td>
<td>79.00 9.75</td>
<td>74.50 3.73</td>
</tr>
<tr>
<td>HPmood</td>
<td>79.04 14.74</td>
<td>79.04 10.13</td>
</tr>
<tr>
<td>Self Esteem</td>
<td>75.42 18.10</td>
<td>79.71 12.51</td>
</tr>
<tr>
<td>Optimism</td>
<td>64.76 25.30</td>
<td>64.76 11.68</td>
</tr>
<tr>
<td>Approach Coping</td>
<td>76.19 13.25</td>
<td>58.57 21.50</td>
</tr>
<tr>
<td>Avoidance Coping</td>
<td>51.42 16.80</td>
<td>73.33 15.39</td>
</tr>
<tr>
<td>Sx Depression</td>
<td>17.75 21.69</td>
<td>18.77 10.57</td>
</tr>
</tbody>
</table>

Descriptively it can be seen that Paralympic athletes used more approach coping strategies and fewer avoidance coping strategies when managing potential stressors. To test for significance, a Mann-Whitney U test demonstrated that avoidance coping was the only variable found to significantly differ between the two groups \((z = -2.24, p = .02, r = .85)\). The people from the general population reported employing significantly more avoidance coping strategies \((M = 73.33, SD = 15.39, n = 7)\) when compared to Paralympic athletes \((M = 51.42, SD = 16.80, n = 7)\).
It should be noted that the mean scores for HPMood and optimism are identical for each group. The results have been carefully checked and this duplication is due to coincidence rather than typographical error.

Pre & Post Competition Assessment

One week prior to the start of competition, participants completed the second SWB assessment. Then, approximately one month following the conclusion of competition, they completed the final assessment. To test the second hypothesis that SWB scores would remain consistent across initial measurement, pre-competition and post-competition phases, Figure 1.2 displays the mean SWB and domain values for all athletes at each measurement time point. The bars represent the average strength of satisfaction reported at each time point.

Figure 1.2 – Average SWB and domain scores at each measurement time point using all available data.
Descriptively, it can be seen that SWB scores remained relatively stable between initial measurement and pre-competition phases. However, post-competition SWB scores dropped by a total of six points, below the normative values (76.7-73.7; Cummins et al., 2013). The majority of domains also displayed this trend over time. However, satisfaction with standard of living, personal relationships, and personal safety increased from initial measurement to pre-competition and then dropped during the post-competition phase.

The third hypothesis proposed that, in the lead up to competition, symptoms of depression would decrease while the other psychological variables would increase. When considering all athletes measured at each time point, Figure 1.3 shows that all psychological variables related to SWB increased in the lead up to competition while symptoms of depression became minimal.

![Figure 1.3 – A comparison of psychological variables at each measurement time point using all available data.](image-url)
The fourth hypothesis suggested that following the conclusion of competition both psychological resources and symptoms of depression would return to initial levels. Figure 1.3 shows these comparisons. Following competition, all positive variables decreased, returning to levels slightly above initial values. Once the Paralympic Games finished athletes reported experiencing more symptoms of depression, but these were similar to the levels reported at initial measurement.

In summary, Paralympic athletes displayed higher SWB scores when compared to the able-bodied general population. Between the initial measurement and pre-competition measurement time points SWB scores remained stable, while psychological resources increased and symptoms of depression decreased. During the post-competition measurement time point, SWB scores were shown to decrease, below the normative range, while both psychological resources and symptoms of depression returned to initial levels.

DISCUSSION

The purpose of this pilot study was to detail the SWB of a small group of elite athletes with disabilities in the months leading up to the London 2012 Paralympic Games and one month following the conclusion of competition. Although no known prior research has attempted to do this, the study was limited by the small sample of athletes. Consequently, it is acknowledged that the study findings may not generalize beyond the present sample. It is also recognized that the use of descriptive and non-parametric statistics may have been insufficient to
adequately detect significant differences. Bearing this in mind, the following sections attempt to account for the results observed.

The initial hypothesis tested was that the athletes would report higher than normal levels of SWB. This was based on previous findings of greater general life satisfaction and self-esteem among athletes compared to other groups (Campbell & Jones, 1994; Campbell, 1995; Greenwood et al., 1990). The results supported this prediction. The mean SWB of the athletes (78.97 points) was above the normative range for the Australian population of 73.6 to 76.6 points (Cummins, 2010).

In terms of the Personal Well-being Index (PWI) domains, six of the seven domains were within or above the domain-specific normal ranges, with personal relationships being the only domain observed below range. Clearly, these athletes appear to be a high functioning group of individuals, despite a marked deficit in one very important domain.

In the present study, athletes reported their relationship satisfaction was substantially below the normative range, indicating they possess inadequate or poorly developed relationships. Elite athletes often report being unable to spend time with family and friends (Noblet & Gifford, 2002; McKay, Niven, Lavallee & White, 2008) and the close relationships with coaches and family they rely on can be overly negative and critical (Cohn, 1990; Gould, Jackson & Finch, 1993; McKay et al., 2008; Noblet & Gifford, 2002). Additionally, some evidence also suggests that individuals with physical disabilities face internal and external
barriers to develop social competencies that may detract from personal relationships (Blinde & McClung, 1997).

Personal relationships form a central role in the maintenance of SWB by buffering against stressful and traumatic experiences (Bonano, Galeam Buccionelli & Vlahov, 2007; Cummins & Wooden, 2014; Pietrzak et al., 2010). Deficits in this interpersonal resource not only increase exposure to stressors but also negatively affect SWB. However, the SWB of this athlete group was not adversely affected, suggesting they have developed alternative, compensatory mechanisms to maintain their sense of SWB.

The high SWB of this group of athletes can also be compared with other high and low functioning groups identified within the Australian population. For example, people who live with a partner, or live with a partner and children, in addition to an annual income of more than $150,000 reported the highest SWB score of 79.3 points. Individuals who lived alone and were unemployed reported the lowest score of 60 points (Cummins, Walter & Woerner, 2007). Based on these findings, the combined effect of supportive close relationships and possessing a high income assists in the maintenance of SWB (Cummins & Nistico, 2002; Cummins & Wooden, 2014; Cummins et al., 2007).

However, when the income and relationship effect on SWB is applied to the present sample of Paralympic athletes, their influence is likely much less dramatic. As previously noted, the group of Paralympians reported low levels of
relationship satisfaction, which would indicate they have few relationships they can rely on for support.

The effect of income also seems to play a diminished role in the SWB of this Paralympic group. Although income was not directly assessed, government funding, a primary source of financial assistance provided to elite athletes deemed to be in contention for medals, is capped at $20,000 per year (Australian Sport Commission, 2012). While many of these individuals attend university or find employment, it is highly unlikely that amateur Paralympic athletes have an annual income greater than $150,000. This would suggest that there are factors other than income and relationships that contribute to this athlete group’s evaluation of SWB.

One important contribution may be their sense of purpose in life. Described as engaging in the pursuit of meaningful goals that produce fulfilment, establishing a purpose in life has been strongly associated with positive SWB (Emmons, 1986; Ho, Cheung & Cheung, 2010; Schueller & Seligman, 2010). An indication of the present group’s sense of purpose is their satisfaction with achieving in life. Their average score of 84.3 points was well above the domain normative range (77.4 – 81.5 points) suggesting they are engaged in pursuits that motivate them to attain important life goals.

A primary motive reported among elite athletes with disabilities has been the demonstration of competence (Page, O’Connor & Peterson, 2001), and it is this demonstration of personal efficacy, which facilitates positive affect (Bandura,
Thus, being selected to represent their nation at the Paralympic Games would likely be a powerful source to affirm a sense of purpose, competence, and SWB.

The influence of physical activity may be another factor that contributes to their elevated sense of SWB. In the present study, the athletes trained for 10 or more hours per week, a figure well above health recommendations (Canadian Society for Exercise Physiology, 2013). As such, increased frequency and intensity of physical activity has been related to higher levels of SWB (Cummins et al., 2008; Fox, 1999). Although it is uncertain why this relationship exists, physical activity may provide a stress buffering effect (Gerber et al., 2010), which like money and relationships, could help maintain SWB.

In addition to these factors, athletes selected to compete at high profile events like the Paralympic Games receive support services from expert coaching, medical and psychological services (Greenleaf et al., 2001; Sotiriadou & Shilbury, 2009). They also receive media recognition (Ellis, 2009) and emotional support from their teams and communities (Greenleaf et al., 2001). These forms of external support likely serve as flexible resources that can be drawn upon to manage challenges and potential threats to SWB. Thus, having access to such support systems may serve a preventative function enabling this group of athletes to maintain a positive sense of SWB, even in the face of substantial challenges.

Internal psychological resources should also be considered in this context. The resources most often associated with SWB maintenance are self-esteem,
optimism and the use of coping strategies (Carver et al., 2010; Richardson et al., 2009; Cummins & Wooden, 2014; Cummins & Nistico, 2002; Lyubomirsky et al., 2005). While all individuals use these resources to some extent, the present study showed that Paralympic athletes employed more approach and fewer avoidance coping strategies than individuals from the general population. It is this distinction that may contribute to higher levels of SWB.

Pursuing avoidance strategies has been found to negatively affect mood, competence, personal control and life satisfaction (Elliot et al., 2011; Van Dijk et al., 2013). On the other hand, approach strategies facilitate a positive sense of SWB by motivating individuals towards positive stimuli and desired outcomes (Carver, Sutton & Scheier, 2000; Elliot, 2008). It may be that elite athletes typically perceive more control and influence in the outcomes of events and view potential difficulties as challenges rather than threats (Golby & Sheard, 2004). As a result they use more approach and less avoidance coping strategies (Nicholls et al., 2008), which may contribute to their higher sense of SWB.

In summary, the first hypothesis was supported in that Paralympic athletes displayed higher levels of SWB when compared to normative able-bodied population norms. It is suggested that a combination of physical, psychological and environmental factors might have contributed to satisfaction with life domains and ultimately their positive sense of SWB.

The second aim of this pilot project was to evaluate the stability of athlete SWB over a period of five months, around the time of the London 2012
Paralympic Games. The results showed that SWB remained stable between the initial measurement and pre-competition time points. This finding was anticipated given the hypothesised influence of homeostasis to maintain positive affect under modest levels of challenge (Cummins, 2010; Cummins & Wooden, 2014). This stability is accomplished by allocating resources like optimism, self-esteem and coping strategies to the defense of HPMood (Cummins, 2010; Cummins & Nistico, 2002; Cummins & Wooden, 2014).

The use of such psychological resources forms an adaptive response to maintain normal levels of SWB. Of particular interest in this regard is the observation that, between initial measurement and pre-competition levels, psychological resources increased. The lead up to Paralympic competition can be incredibly stressful and exciting time for athletes (Gould & Maynard, 2009) and, as such, the homeostatic system responds to maintain a positive sense of SWB through the increased use of psychological resources. Unsurprisingly, during the lead up to this positive life event symptoms of depression were observed to decrease.

However, between pre-competition and post-competition, SWB decreased by approximately six points (79 to 73.1 points). This observation is not surprising given this pattern has been well documented in relation to the occurrence of other life events, where SWB returns to initial levels or falls below initial values (Clark, Deiner, Georgellis & Lucas, 2008; Nawijn et al., 2010). It is possible that returning to everyday life, after the Paralympic Games, was perceived as a negative event that resulted in lowered SWB until re-adaptation occurred.
During this post-Games period, positive mood, self-esteem, optimism and the use of coping strategies were shown to return to initial measurement levels. This observation can be likened to a process of down regulation similar to physiological stress responses. Once a stressor has been removed, additional resources are no longer required to cope with its challenge (Sterling, 2010). Thus, the use of psychological resources would also decrease to match the current level of demand (Cummins, 2010).

As with the other measured variables, symptoms of depression returned to initial levels, and remained within normal ranges. Despite several anecdotal reports (Gahwiler, 2007; Gordin & Henschen, 2012; McCann, 2000), there was no evidence of a post-Games depression. Although some athletes may, indeed, have experienced depressive episodes after the Games, this would be more likely in response to a failed performance (Hammond, Gialloreto, Kubas & Davis, 2013) than to closure of the event. Thus, the re-emergence of normal range negative affect is likely a product of the diminished subjective intensity of the everyday environment (Frederick & Loewenstein, 1999).

The cumulative effect of returning to everyday life, decreased SWB, a down regulation of psychological resources, and re-emergence of normal range negative affect can be best described as a process of normalisation. Similar to other major life events, the Paralympic Games presented a high intensity stimulus that caused a shift in SWB and other psychological variables. Now that this event is over, athletes begin to adapt and recover to the new stimuli of everyday life (Frederick & Loewenstein, 1999).
In summary, this preliminary assessment of SWB coinciding with the Paralympic Games provides novel insights into the psychological functioning of elite athletes. In the lead up to competition, the allocation of psychological resources increased to meet the demands of the Games and enabled the stable sense of SWB. Following the conclusion of competition, the reduction in SWB likely reflected changes in adaptation level that resulted in desensitisation of less intense experiences and the normalising process that occurs following the removal of a stressor. Although no evidence was found for post-Paralympic depression, athletes experienced a normalising process when they returned to everyday life.

Limitations

The major limitation to this project is, obviously, the small sample size. An explanation for this illuminates the difficulties of research in this exclusive area. It was initially anticipated that all 175 athletes of a 2012 Paralympic team would participate in the study. In order to facilitate this, extensive applications and proposals were submitted to the relevant organisation 12-months prior to the event. The subsequent negotiation period seemingly did not raise any major impediments to the study proceeding. However, one week prior to initial data collection, the sport organisation negated the agreement due to concerns that the project would interfere with athlete preparations and performance. As a result, the project proceeded as a pilot study with just seven members of a Paralympic team. This severely limited the types of analyses that could be conducted and the generalizability of results.
A second limitation applies to considering the SWB of athletes in the post competition phase. Here, the influence of sport performance was not accounted for. Past research has documented that success or failure in elite sport has been associated with positive and negative changes in athlete affect (Hammond et al., 2013; Hassmen & Blomstrand, 1995; Jones & Sheffield, 2008). Although official results were collected, athletes competed in multiple events or teams sports, which made determining their overall performance difficult to quantify. It is likely that performance goals other than discrete outcomes like winning a medal would influence their perception of a successful or failed performance. As such, it might be more important to consider subjective performance ratings as they might align more closely with individual goals and performance evaluations. Therefore, the collection of individual self-rated performance data should be considered in future studies.

Conclusions

The purpose of this pilot study was to evaluate the SWB of Paralympic athletes over a period of five months, overlapping with the London 2012 Paralympic Games. At initial measurement, three months prior to competition, it was found that the athletes reported higher levels of SWB and higher satisfaction with most life domains when compared to the general population.

In the lead up to competition, SWB remained stable during this three month period. This was likely due to the increased allocation of positive affect,
self-esteem, and optimism to the homeostatic processes and the use of coping strategies to meet demands.

One month after the end of competition, SWB decreased, due to the normalising process that occurs following adaption to life events. No evidence was found to support the notion of post-Paralympic depression. However, athletes may experience this normalising process as a letdown when they return to everyday life.

This pilot study presented a number of novel findings limited, however, by a small sample size and did not consider the effects of sport performance. In an attempt to further expand on this topic and address the identified shortcomings, further research has been conducted in the form of study two. This study evaluates changes in self-rated performance and athlete SWB over the course of a five-day national team selection camp.
CHAPTER 3

SELF-RATED SPORT PERFORMANCE
AND SUBJECTIVE WELL-BEING

INTRODUCTION

Findings from the previous study indicated that in the lead up to the Paralympic Games athletes maintained a stable level of Subjective Well-being (SWB), which was above the normal range. However, during the post-competition period, SWB decreased below the normative range. Although this may have been due to normalising process that occurs following a positive life event, the influence of athlete performance on SWB was not accounted for. Thus, the focus of study two is document the SWB of elite athletes with disabilities in relation to their self-rated sport performance. This study will include a sample of wheelchair basketball athletes who were attempting to qualify to represent their nation at world championship and Paralympic events.

As previously discussed, SWB is a generic description of mood, and life satisfaction, primarily involving affective evaluations (Blore et al., 2011; Cummins, 2005; Davern et al., 2007). Though this construct is normally positive and is remarkably stable (Cummins 1995; 1998), environmental events can have a powerful influence on the level of SWB (Cummins et al., 2007). Following a negative life event, such as the onset of disability, unemployment or divorce, SWB has been shown to decrease (Lucas, 2005, 2007b; Lucas, Clark, Georgellis
& Diener, 2003). On the other hand, individuals who experience a positive event, like getting married, going on vacation or receiving a promotion, experience increased positive affect and SWB (Boswell et al., 2005; Lucas & Clark, 2006; Nawijn et al., 2010).

Within an elite sport context, the outcome of important performances would likely exert a measurable effect on SWB. In the world of elite sport, performance is paramount and every effort is made to achieve success (Jones & Sheffield, 2008). Athletes, devote a considerable amount of their life to ensure they are physically and mentally prepared to achieve specific performance standards and goals (Gould & Maynard, 2009; Greenleaf et al., 2001; Lundqvist, 2011).

Governments and sport organisations also make considerable investments to attain desired outcomes (Green & Houlihan, 2005). For instance, the Own the Podium program provided considerable government financial and resource support to national sport organisations to increase the medal counts of Canadian athletes at the summer and winter Olympic and Paralympic Games (Government of Canada, 2014). Unsurprisingly, athletes experience a tremendous amount of pressure to succeed and maintain performance standards (Parham, 1993). Given this emphasis on performance success, it seems logical to suggest that competition outcomes would likely influence affective responses and athlete SWB.
Several studies have investigated the influence of competition or game outcome on the psychological characteristics of able-bodied athletes. Successful performances are typically associated with pleasant affect (Wilson & Kerr, 1999), more activation, lower levels of anger, and fewer somatic complaints. Following an unsuccessful performance, the opposite trend is observed (Hassmen & Blomstrand, 1995; Jones & Sheffield, 2008). Further evidence has suggested that more severe psychological consequences are a distinct possibility following the failure of an important performance. For instance some elite athletes, who failed at national team qualifying trials, met diagnostic criteria for a major depressive episode following the event (Hammond et al., 2013).

The outcomes of sport competitions have also been shown to influence self-esteem. Described as a feeling of adequacy (Lyubomirsky et al., 2006) and perceived competence (Sonstroem, Harlow, Gemma & Osborne, 1991), self-esteem has often been a topic of interest when considering the influence of performance. Typically, the focus on this relationship has been in the context of vocational and academic success. For instance, it has been observed that salubrious outcomes lead to higher self-esteem that facilitates persistence in the face of challenge (Baumeister, Campbell, Krueger & Vohs, 2003).

When considering this relationship in a sport context, similar patterns of results emerge. Athletes who are successful report increased levels of self-esteem and report less self-esteem when they are unsuccessful (Bardel, Fontayne, Colombel & Schiphof, 2010). Given the close association between self-esteem
and SWB (Lyubomirsky, et al., 2006), it is probable that both variables would be influenced by competition results.

Although analyses indicate that performance outcomes influence affective responses and self-esteem, the relationship between outcome and affective response may be more complex. The way in which an athlete perceives their performance also likely influences the affective response (Kerr Wilson, Bowling & Sheahan, 2005) and perception of SWB. Discrete outcomes like winning or losing a competition may not always match an athlete’s perception of success or failure (Spink & Roberts, 1980). For example, an athlete might perform well but lose the game. In response they might display some disappointment but maintain a positive sense of mood and perception of self, knowing they delivered a satisfactory performance. Thus, self-perceived performance may be more closely related to SWB than their actual performance (Dewar & Kavussanu, 2011).

Despite this perspective, very little is known about the relationship between self-rated performance and the SWB of elite athletes. A qualitative study reported that satisfaction with performance was associated with feelings of happiness while performing below personal standards was associated with sadness and shame (Uphill & Jones, 2007). However, these findings could actually be due to differences between highly skilled, successful athletes and those who are less skilled.

In general, successful people report more positive affect, (Lyubomisrky, King & Diener, 2005), in addition to more perceived control, confidence, coping
skills, and less negative affect (Martin et al., 2011; Nicholls et al., 2008; Smith, Schutz, Smoll & Ptacek, 1995; Weissensteiner, Abernethy, Farrow & Gross, 2012). Such a combination of psychological resources and characteristics would likely contribute to their athletic success, reinforcing positive affect.

Subjective performance has also been related to motivation. When focused on task mastery, athletes perceived their performance more positively, which was associated with more positive affect and less negative affect. However when focused on demonstrating superiority, performances were perceived more adversely, leading to more negative affect and less positive affect (Dewar & Kavussanu, 2011). These findings further highlight the importance of considering an individual’s perception of success and how they relate to affective responses. Therefore, the relationship between self-rated performance and the affective responses of athletes should be considered.

In summary, the self-perceived outcomes of athletic competition may influence the SWB of athletes. The second study has been developed to investigate this possibility and has three main objectives. The first objective is to examine changes in SWB and self-rated performance that will be conducted over the course of a five-day national team selection camp. The second is to evaluate the relationship between self-rated performance, SWB and self-esteem. The final objective is to determine if athletes with high or low performance ratings differ in respect to SWB, self-esteem, optimism, and coping strategies. Based on these objectives three hypotheses are as follows:
1. Self-rated performance, mood and SWB will vary over the days of the study.

2. Self-esteem will mediate the relationship between self-rated performance and SWB.

3. Athletes identified as high self-rated performers will display more approach coping and higher levels of confidence, self-esteem and positive affect when compared to athletes identified as low self-rated performers.

**METHOD**

**Human Ethics and Organisational Approval**

This study was approved by the Deakin University Human Ethics Research Committee (reference number 2011-149).

Once ethics approval was received, research proposals were submitted to male and female national wheelchair basketball teams. Following a review by the team’s coaching and psychology staff, the research proposal was approved. A formal agreement was then developed between the principal investigator and the wheelchair basketball teams to establish conditions of participation and project procedures.
Participants

All 35 athletes nominated to attend the national team selection camp were invited to participate in the study. Of these, 13 athletes provided responses during each day of the selection camp.

The sample comprised four male and nine female wheelchair basketball athletes between the ages of 16 and 40 years, with a mean age of 30.00 (SD = 6.96). Five were returning members of the national team and were attempting to maintain their standing, while eight were vying for a place on the team. One athlete indicated they played wheelchair basketball professionally in addition to being a member of the national team. A large portion athletes (46.2 %) indicated they spent approximately 4 to 9 hours per week engaged in sport-specific training and 53.8 % reported training for 10 or more months of the year.

Sport specific classification was determined using a point system designed to group athletes according to their activity limitations in wheelchair basketball (International Paralympic Committee, 2014). Seven different classifications were represented, ranging from 1.5, indicating some difficulty performing basketball skills due to physical impairment to 4.5, indicating normal trunk movement with no activity limitations. In respect to the onset of disability, most athletes (84.6 %) reported that their disability was acquired later in life. Details of these demographic characteristics are presented in Table 2.1.
Table 2.1

Participant Demographics

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>4</td>
<td>30.80</td>
</tr>
<tr>
<td>Female</td>
<td>9</td>
<td>69.20</td>
</tr>
<tr>
<td>Team Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Returning</td>
<td>5</td>
<td>38.50</td>
</tr>
<tr>
<td>Hopeful</td>
<td>8</td>
<td>61.50</td>
</tr>
<tr>
<td>Training Hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4-9</td>
<td>6</td>
<td>46.20</td>
</tr>
<tr>
<td>10-15</td>
<td>3</td>
<td>23.10</td>
</tr>
<tr>
<td>16-20</td>
<td>2</td>
<td>15.40</td>
</tr>
<tr>
<td>21+</td>
<td>2</td>
<td>15.40</td>
</tr>
<tr>
<td>Disability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Congenital</td>
<td>2</td>
<td>15.40</td>
</tr>
<tr>
<td>Acquired</td>
<td>11</td>
<td>84.60</td>
</tr>
</tbody>
</table>

Procedure

One month prior to the start of the national team selection camp, all athletes were sent an informational letter produced in collaboration with the psychology staff. This letter included a link to the study website. If an athlete was interested in participating, they accessed the web-link and provided their informed consent. The athletes were then asked to provide demographic information. The items were produced in a web-based format, which enabled them to complete the assessments at home or while overseas. The questionnaire took approximately 15 minutes to complete.

A repeated measures design was employed to evaluate changes in SWB and performance over the five days of training and competition as part of the national team selection camp. This camp involved individual anaerobic and
aerobic workouts and team competitions. During the selection process, athletes were contacted by email each evening to prompt them to complete the assessment for that specific day. They then completed the assessments at the end of each training/competition day for a total of five measurement time points.

This survey was completed online and took approximately one minute to complete. Following each data collection period, the principal psychologist for each team was provided with a brief wellbeing report for each athlete. This report enabled the principal psychologist to follow up as required with the athlete.

Measures

The same scales employed in study one were used to measure SWB and Homeostatic Protected Mood (HPMood). Full details of these scales can be found in the Method section of study one.

The measure of self-rated athletic performance was adapted from a question previously used to measure subjective athletic performance (Cox, Martens & Russell, 2010). The item required the athletes to reflect on their own satisfaction with performance (How satisfied are you with your performance today?). Consistent with previous measures, an end defined 11-point scale from 0 (not at all) to 10 (extremely) was used.

As previously agreed with the wheelchair basketball teams, it was essential to ensure that the time to complete the daily survey was kept to a
minimum so as not to interfere with the athletes evening recovery. As such, single
items, rather than whole scales were used to gain insights into a variety of
pertinent psychological factors related to SWB and sport performance.

In order to achieve this item selection, a three-member panel consisting of
a senior research psychologist, a clinical psychologist and a sport psychologist
reviewed each source questionnaire to determine which items best represented the
construct being assessed. Once consensus was reached, the items were included.
The items covered the areas of self-esteem, optimism, approach and avoidance
coping, depressed mood, sport confidence, and cognitive anxiety. Table 2.2
provides an overview of each specific item and the questionnaire from which it
was selected. All items were rated on an end defined 11-point scale from 0 (not at
all) to 10 (extremely).

Data Analyses

Prior to analyses, the data were checked for acquiescent responses, as
recommended by the PWI manual (International Well-being Group, 2013). No
evidence of acquiescent responding was observed and all participant data were
retained. All scores were then converted to a 0-100 point scale, as described for
study one.
Table 2.2

Single Item Information

<table>
<thead>
<tr>
<th>Construct</th>
<th>Item</th>
<th>Measure</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td>On the whole, I am satisfied with myself.</td>
<td>Rosenberg Self-Esteem Scale</td>
<td>Rosenberg, (1965)</td>
</tr>
<tr>
<td>Optimism</td>
<td>I am always optimistic about my future.</td>
<td>Life Orientation Test-Revised</td>
<td>Scheier et al., (1994)</td>
</tr>
<tr>
<td>Approach Coping</td>
<td>When something bad happens I put lots of time into overcoming it.</td>
<td>Approach/ Avoidance Coping Scale</td>
<td>Cousins (2002)</td>
</tr>
<tr>
<td>Avoidance Coping</td>
<td>When something bad happens I relax and don’t think about it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>I felt that I had nothing to look forward to.</td>
<td>Depression, Anxiety &amp; Stress Scale</td>
<td>Lovibond &amp; Lovibond (1995)</td>
</tr>
<tr>
<td>Sport Confidence</td>
<td>I am confident I will perform well.</td>
<td>Revised Competitive State Anxiety</td>
<td>Cox et al., (2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inventory-2</td>
<td></td>
</tr>
<tr>
<td>Cognitive Anxiety</td>
<td>I am concerned that I may not do as well in the training and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>competition as I could.</td>
<td></td>
</tr>
</tbody>
</table>

The data were then checked for univariate and multivariate outliers. No cases met criteria of falling three standard deviations above or below the mean value (Tabachnick & Fidell, 2007). Multivariate outliers were considered using Mahalanobis distance at the critical chi-square value of 24.72 ($df = 11, p < .01$). No scores exceeded this value. Based on these procedures, the data of all participants were retained for analyses.

Data were also checked to determine if they represented a normal distribution of scores using the Kolmogorov-Smirnov statistic. The test was non-significant for all measures, indicating that they were normally distributed. The
only exception was for the average depression score, which was found to be in the normal range of severity. However, given that the lifetime prevalence of depression is approximately 17\%, (Suvisaari et al., 2009), it is anticipated that this variable would not be normally distributed.

All analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM, 2012). Initially, demographic and descriptive statistics were calculated for all variables. Mean scores for each variable were calculated by summing the responses and then dividing by the number of days each variable was observed. These scores were then used to determine Pearson correlation coefficients to examine relationships between variables.

To assess for potential changes in SWB, mood and self-rated performance over the five days of the selection camp, three repeated measures ANOVAs were employed. This method was selected because a MANOVA assumes that the independent variable affects each dependent variable in a consistent manner (Tabachnick & Fidell, 2007). Given that the effect of time on these variables is not yet well understood, the effect of the independent variables on the dependent variables were considered separately. Thus, results will be considering using Bonferroni correction (p < .01).

To determine the association between self-rated performance, self-esteem and SWB a mediation analysis was completed. Given the smaller sample size, a bootstrap method proposed by Preacher and Hayes, (2004; 2008) was utilised. Coefficients were calculated for each pathway and the significance of the indirect
or mediation effect was evaluated using bias corrected bootstrap confidence intervals and a normal theory test (Preacher & Hayes, 2004; 2008). This is a non-parametric test that circumvents issues related to skewed distribution of products found in mediation analyses. Because this technique is not based on large sample theory it can be applied to small samples with more confidence. However, this approach does not offer the same ability to control for measurement error offered in structural equation modelling (Preacher & Hayes, 2004).

Subsequently, the relationship between self-rated performance and SWB was further explored. Athletes were classified as high or low perceived performers based on the deviation of the individual score from the group mean of self-rated performance. Thus, a score above the group mean was classified as a high-perceived performer. ANOVAs were then used to evaluate differences in SWB variables between the two groups.

RESULTS

Descriptive Statistics

Athlete responses were collected at the end of each training/competition day during a five-day national team selection camp. To calculate descriptive statistics, scores were averaged over the five days of the selection camp. Table 2.3 has been prepared to display the mean scores for each dependent variable.
Table 2.3

*Descriptive statistics*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWB</td>
<td>65.14</td>
<td>94.29</td>
<td>82.95</td>
<td>9.35</td>
</tr>
<tr>
<td>HPMood</td>
<td>70.00</td>
<td>91.33</td>
<td>79.38</td>
<td>7.71</td>
</tr>
<tr>
<td>Self-rated Performance</td>
<td>58.00</td>
<td>90.00</td>
<td>74.92</td>
<td>9.15</td>
</tr>
<tr>
<td>Depression</td>
<td>.00</td>
<td>66.00</td>
<td>12.77</td>
<td>19.95</td>
</tr>
<tr>
<td>Competitive Anxiety</td>
<td>.00</td>
<td>66.00</td>
<td>33.84</td>
<td>23.01</td>
</tr>
<tr>
<td>Confidence</td>
<td>60.00</td>
<td>98.00</td>
<td>77.84</td>
<td>10.93</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>60.00</td>
<td>100.00</td>
<td>81.23</td>
<td>11.81</td>
</tr>
<tr>
<td>Optimism</td>
<td>62.00</td>
<td>96.00</td>
<td>77.23</td>
<td>10.50</td>
</tr>
<tr>
<td>Approach Coping</td>
<td>22.00</td>
<td>90.00</td>
<td>60.31</td>
<td>21.44</td>
</tr>
<tr>
<td>Avoidance Coping</td>
<td>26.00</td>
<td>76.00</td>
<td>48.31</td>
<td>15.87</td>
</tr>
</tbody>
</table>

The average SWB scores for athletes in this study are approximately seven points higher than the normative values (76.7-73.7; Cummins et al., 2013) for the general Australian population. Consistent with findings from study one, the athletes on average displayed minimal symptoms of depression and competitive anxiety, while reporting high levels of HPMood, self-esteem, and optimism. They also reported using more approach coping than avoidance coping strategies.

As described in the method section, mean scores were calculated for each variable over the five days. Pearson correlation coefficients were then calculated for each variable and are shown in Table 2.4. The correlations reveal a number of noteworthy relationships can be observed. There were strong positive relationships between SWB and self-rated performance (.76), and between self-esteem and SWB (.81). These are consistent with expectation from the literature review.
Interestingly, HPMood displays very strong associations with self-esteem and optimism but did not have a significant relationship with SWB. Some other unexpected results also emerged. For example, approach coping had only a weak correlation with the other variables. This may indicate that when athletes are faced with a challenge over which they have low levels of control, there is only so such they can do to actively change the situation.

**Stability of SWB, HPMood and self-rated performance**

The primary objective of this study was to assess changes in SWB, HPMood and self-rated performance over the course of the five days. The mean values for each variable, during each training/competition day are shown in Figure 2.1. It can be seen that SWB remained stable over time, between 82.3 to 83.5 points, while HPMood also remained stable, between 78.2 and 80.5 points.
However, self-rated performance initially increased by seven points between days one and two, and then gradually declined by approximately 10 points by the final day of selection camp.

**Figure 2.1** – Mean scores of SWB, HPMood and self-rated performance measured at the conclusion of each day during the national team selection camp.

The mean scores and standard deviations of each daily assessment are presented in Table 2.5. Although negative affect (symptoms of depression) was not shown in Figure 2.1, it has been included here to provide further insight into the athlete’s affective responses over the course of the selection camp. To statistically evaluate the stability of these variables over the five-day period, repeated measures ANOVAs were conducted.
Table 2.5

Average daily scores for dependent variables (n = 13)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Day 1</th>
<th>Day 2</th>
<th>Day 3</th>
<th>Day 4</th>
<th>Day 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>SWB</td>
<td>82.31(10.40)</td>
<td>83.51(7.90)</td>
<td>83.07(10.50)</td>
<td>83.07(9.00)</td>
<td>82.85(10.50)</td>
</tr>
<tr>
<td>HPMood</td>
<td>78.20(7.40)</td>
<td>80.51(7.10)</td>
<td>78.97(9.10)</td>
<td>79.74(8.30)</td>
<td>79.48(10.20)</td>
</tr>
<tr>
<td>Self-rated</td>
<td>72.31(14.80)</td>
<td>79.23(11.80)</td>
<td>78.46(9.80)</td>
<td>75.38(11.90)</td>
<td>69.23(15.50)</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>20.0(29.72)</td>
<td>10.0(19.14)</td>
<td>9.23(18.91)</td>
<td>11.54(21.92)</td>
<td>13.08(20.97)</td>
</tr>
</tbody>
</table>

Prior to analyses Mauchly’s Test of Sphericity was completed for each variable. All values were non-significant, indicating that each variable met the assumption of sphericity, thus meeting the necessary criteria to perform the analysis. Repeated measures ANOVAs showed no significant differences in any of the variables over time (SWB \(F(4, 9) = 0.24, p = .91\), HPMood \(F(4, 9) = 2.20, p = .15\), self-rated performance \(F(4, 9) = 1.30, p = .34\)) and depression \(F(4, 9) = 2.28, p = .14\).

In conclusion, there were no statistically significant changes in any of the three variables over the period of the five-day selection camp. In part at least, this was due to the small number of respondents, which detracts from the power of the analysis. However, the maximum differences in SWB (1.2 points) and HPMood (2.3 points) were small, suggesting these variables are more stable when compared to self-rated performance (10 points) and depression (11 points).
The relationship between self-rated performance, self-esteem and SWB

The second aim of this study was to explore the relationship between self-rated performance, self-esteem and SWB. This was completed using mediation analyses. The assumption of linearity was tested using the Durbin-Watson statistic ($d$). The values obtained for each regression were above the upper and lower critical values ($d_l = 0.74, d_u = 1.03$; Savin & White, 1977), revealing no evidence of auto-correlations. This suggests that the errors are independent of each other and thus conducive to linear analyses (Tabachnick & Fidell, 2007).

The mediation analysis tested the indirect relationship between self-rated performance and SWB through self-esteem. As described in the method section, the bootstrap procedure proposed by Preacher and Hayes, (2004; 2008) was used. This method is recommended as a suitable procedure to produce reliable results for small sample sizes and allows for significance testing of indirect effects. The mediation model is shown in Figure 2.2.
Figure 2.2 – Model 1 mediation pathways where self-rated performance (S-RP) affects SWB indirectly through self-esteem

The direct relationship between self-rated performance and SWB is symbolized by pathway c ($p = .002$). Within the mediation model, the relationship between self-rated performance and self-esteem is represented by pathway a ($p = .004$). The relationship between self-esteem and SWB is denoted by pathway b ($p = .04$). Each of these pathways was statistically significant. However, when self-esteem was included in the regression equation, the significant direct effect of self-rated performance on SWB was negated. This pathway has been represented by c’ ($p = .159$) in Figure 2.2. These findings imply that self-esteem fully mediated the relationship between self-rated performance and SWB. In total 72% of the variance in SWB was accounted for by this model, $F(2, 10) = 13.05, p < .001$. 
To evaluate the significance of the mediation effect \((ab = .40)\), bias corrected bootstrapped confidence intervals \((CI = 95\%)\) were calculated. Based on 1,000 bootstrap samples, both upper and lower intervals were entirely above zero \((.159 \text{ to } .921)\). Given these intervals do not include zero, this indicates that self-esteem significantly mediated the relationship between self-rated performance and SWB (Hayes, 2013; Warner, 2013). Given the small sample size, confirmation of this result was sought using a normal theory test (Preacher & Hayes, 2004; 2008; Warner, 2013). Using this method, \(z\) scores were calculated and again confirmed that self-esteem significantly mediated the relationship between self-rated performance and SWB \((z = 2.03, p = .041)\).

To provide further support for the structure of this model, two additional mediation analyses were completed. These were performed to test the suspicion that the high correlations between the variables were responsible for the model fit and that similar models could be achieved by simply reversing the pathways. Therefore, to tests the utility of Model 1, the direction of the mediation pathways was reversed (see Figure 2.3).

Using the same bootstrapping procedure, the results showed that when self-esteem is included in the regression equation, the direct influence of SWB on self-rated performance is not significant \((p = .159)\). Additionally, the relationship between self-esteem and self-rated performance, denoted by pathway \(b\) \((p = .37)\) was not significant. In total, this model accounted for 61% of the variance \(F (2, 10) = 8.11, p = .008\). However, based on the bias corrected bootstrapped confidence intervals \((1.18 \text{ to } -.36)\), the mediation effect was not significant. This
finding was further supported by the calculated z-scores \( z = 1.01, p = .31 \). These findings support the efficiency of the structure proposed in Model 1 and demonstrate that it is both theoretically and statistically preferred to explain the relationship between self-rated performance and SWB.

![Diagram of mediation pathways]

**Figure 2.3** – Model 2 mediation pathways where SWB affects self-rated performance (S-RP) indirectly through self-esteem.

To further confirm the primacy of Model 1, a second follow-up analysis tested whether replacing self-esteem with HPMood in Model 1 would produce similar results (see Figure 2.4). This was based on SWB homeostasis theory, which suggests that when responding to questions of a general nature, responses are affectively driven by HPMood rather than cognitive evaluations (Blore et al., 2011; Cummins, 2010; Davern et al., 2007).
Overall, model 3 accounted for 60% of the variance in SWB $F(2, 10) = 7.67, p = .01$. When HPMood was entered into the regression equation, no changes were observed. The relationship between self-rated performance and SWB remained significant ($p = .01$). Bias corrected bootstrapped confidence intervals indicated that the mediation effect was not significant (.69 to -.14). The calculated z-scores also supported this finding ($z = .74, p = .45$). This finding indicates that shared variance is not responsible for the mediating effect of self-esteem and further supports the efficacy of Model 1.

**Figure 2.4** – Model 3 mediation pathways where self-rated performance (S-RP) affects SWB indirectly through HPMood.
In summary, Model 1 accounted for the largest amount of variance (72%) in the dependent variable. This was the only model to demonstrate full mediation and a significant indirect effect. Though causality cannot be determined from any of these models, the best fitting model explains that the relationship between self-rated performance and SWB is mediated by self-esteem.

**Perceived performance differences**

The third hypothesis proposed that athletes who rated their performance as more successful would display more approach coping and higher levels of confidence, self-esteem and positive affect. To test this premise, the average self-rated performance for all participants ($M = 74.92$) was used as a cut-off marker to delineate between high and low perceived performers. Athletes with an average score below this level were classified as low perceivers. Those who rated their average performance above this cut-off were classified as high perceivers.

ANOVA were then used to determine differences between these two groups. Levene’s test for homogeneity of variances was calculated for each variable. All met the assumption of homogeneity of variance, with the exception of the variable measuring approach coping ($F = 5.52, p = .04$). Based on this result, the Welch and Brown-Forsythe tests were used as suitable alternatives (Pallant, 2011) to evaluate for differences in approach coping between the two groups. All comparisons have been presented in Table 2.6.
Table 2.6

* Differences between self-rated performance groups *

<table>
<thead>
<tr>
<th>Variable</th>
<th>High Perceivers ( n = 6 )</th>
<th>Low Perceivers ( n = 7 )</th>
<th>( M )</th>
<th>( SD )</th>
<th>( M )</th>
<th>( SD )</th>
<th>( F )</th>
<th>( p )</th>
<th>Partial Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWB</td>
<td>89.04</td>
<td>77.75</td>
<td>4.99</td>
<td>9.25</td>
<td>7.10</td>
<td>.02</td>
<td>.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>85.00</td>
<td>71.71</td>
<td>9.69</td>
<td>8.11</td>
<td>7.25</td>
<td>.02</td>
<td>.40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>88.00</td>
<td>75.43</td>
<td>6.69</td>
<td>12.52</td>
<td>4.82</td>
<td>.04</td>
<td>.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approach</td>
<td>53.66</td>
<td>66.00</td>
<td>28.12</td>
<td>12.32</td>
<td>.95</td>
<td>.36</td>
<td>.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The results partially supported the third study hypothesis. As illustrated in Table 2.6, high perceivers reported significantly higher SWB, confidence and self-esteem. Individuals who believed that they delivered a successful performance displayed higher self-esteem and higher SWB. However, no significant differences were found with regard to the use of approach coping strategies between groups.

In summary, athlete SWB and HPMood remained very stable over the course of the selection camp. Although it was observed that self-rated performance varied by 10 points, these differences were not significant. In respect to the second hypothesis, self-esteem was found to fully mediate the relationship between self-rated performance and SWB. Partial support for the third study hypothesis was found where athletes who had high self-rated performance reported significantly higher SWB and self-esteem.
DISCUSSION

The purpose of this second study was to evaluate the SWB of elite wheelchair basketball athletes in relation to their self-rated sport performance during a national team selection camp. The study was limited by a small sample of 13 athletes and as such it is acknowledge that the study findings may not generalize beyond the study sample. Cognizant of this factor, the following sections attempt to account for the results observed.

The initial hypothesis tested was that self-rated performance, SWB and Homeostatic Protected Mood (HPMood) would be positively correlated over time. Thus, as self-rated performance increased so would HPMood and SWB. This was based on previous literature suggesting that both objective and performances perceived as successful were associated with more positive affect and lower negative affect, while the opposite trend was observed for unsuccessful performances (Hassmen & Blomstrand, 1995; Jones & Sheffield, 2008; Uphill & Jones, 2007; Wilson & Kerr, 1999). The results did not support this expectation.

During the five day national team camp, self-rated performance varied by approximately 10 points. Initially, self-rated performance increased by seven points, then after the third day, performance scores decreased by almost nine points. Despite these descriptive changes, SWB and HPMood, both remained stable, varying only by 1.2 to 2.3 points respectively. Though this result was unexpected based on the literature, the stability of SWB and HPMood is consistent with homeostasis theory.
As previously discussed, this theory postulates that SWB is genetically predetermined and regulated within a set-point range. Mild forms of positive or negative events may cause fluctuation within this range, however, only events that overwhelm the homeostatic system will likely lead to significant changes in SWB (Cummins, 2010; Cummins et al., 2014). The results observed in the present study would suggest that the changes in self-rated performance did not produce the required strength to challenge the homeostatic system and significantly affect HPMood or SWB.

Given the prospect of being selected for a national team, one would expect some form of positive affective response following a sport performance that was perceived as successful. Such a performance would provide a sense of mastery (Bandura, 1997), and may increase the probability of being selected to the national team. However, setting high standards and a striving for perfectionism is common among elite athletes (Koivula, Hassmen & Fallby, 2002). Thus, it may be that successful performances in training and competition are expected and do not greatly influence positive affect.

Performance expectations can be formed with a variety of information including confidence, skill and past experience (Carver & Scheier, 1990). When performance satisfaction is high there is likely little discrepancy between expectations and current perceived status. In such instance, there is no threat to self or goal attainment and affect would remain positive (Carver & Scheier, 1990). Although an initial increases in perceived performance was observed, it did not likely exceed athlete expectations, whereby failing to produce a
meaningful change in SWB or HPMood. Consequently, both variables remained positive and stable.

The stability of positive affect also suggests the presence of adaptation and habituation to environmental stimuli. Over time elite athletes will have been exposed to a variety of such positive and negative events. For example attaining a personal best, winning a championship, or failing in competition. Initially such stimuli would produce significant affective responses. However, repeated exposure to such stimuli would diminish their subjective intensity by altering the baseline level (Frederick & Loewenstein, 1999). Similar to the development of tolerance or desensitization, new levels of stimulation will be required to produce affective changes.

Such changes reflect protective functions that reduce the influence of stimuli and enhance perception by signalling changes from baseline (Frederick & Loewenstein, 1999). A number of cases can illustrate this adaptive process in action. For example, receptors down regulate when chronically activated by agonists (Meyer & Quenzer, 2013), and affective normalising occurs following a positive life event (Clark et al., 2008; Nawijn et al., 2010). In the present case, past athletic success has likely altered performance expectations and the threshold required to produce positive changes in affective responses.

Interestingly, what appear to be most often associated with successful performances are changes in negative affect. In the present study, a negative relationship was observed between self-rated performance and symptoms of
depression. When perceived performance increased, symptoms of depression conversely decreased by approximately 11 points.

Close inspection of the results reported in the previous literature that examined athlete affective responses to game outcomes also reveal a similar pattern. Following a successful performance, the variables that measure negative affect consistently show a significant reduction. After a winning performance, variables measuring negative affect all substantially decrease (Hassmen & Blomstrand, 1995; Jones & Sheffield, 2008; Wilson & Kerr, 1999).

However, when considering the influence on positive affect, the effect is less clear. For example, some evidence indicates that athletes experience an increase in vigour following a successful performance while others suggest that no significant changes in positive affect occur from baseline (Kerr et al., 2005; Wilson & Kerr, 1999). This suggests that despite experiencing successful performances, elite athletes appear to be most sensitive to changes in negative affect, while exhibiting constancy in positive affect.

The sensitivity to changes in negative affect also extends to decreased self-rated performance. In the present study, when self-rated performance began to decline, negative affect was observed to increase, while SWB showed little variation. Again the results previously reported in the literature support this finding. Following a loss athletes reported significant increases in negative affect, while no significant changes were noted in positive affect (Hassmen &
The lack of movement in positive affect may be due to the strength of challenge a disappointing performance places on the homeostatic system. In this case a small negative deviation in performance would not likely overwhelm psychological resources, thus SWB is maintained (Cummins, 2010). However, the deviation in performance may be related to changes in negative affect indicating the need to mobilise resources to improve performance.

In conclusion, this data demonstrates a pattern of affective asymmetry, where negative affect appears to be more amenable to change. These changes likely represent adaptive response to environmental stimuli indicating the presence or absence of potential challenges. Thus, when facing a challenging situation, negative affect upgrades to enhance resources to facilitate performance (Forgas, 2013). In the absence of potential challenges, negative affect downgrades enabling core positive mood to dominate.

The second objective of this study was to examine the relationship between self-rated performance, self-esteem and SWB. This was based on previous literature that indicated successful performances likely enhance self-esteem (Bardel et al., 2010; Baumeister, et al., 2003), while failed performances decrease it (Bardel et al., 2010). This, in combination with self-esteem’s close association with SWB (Lyubomirsky, et al., 2006) would suggest the presence of an indirect relationship between variables. Thus, it was hypothesised that self-
Esteem would mediate the relationship between perceived performance and SWB. This proposition was confirmed by mediation analyses.

A significant indirect effect was found where self-esteem mediated the relationship between perceived performance and SWB. Two additional mediation analyses were completed to further test the validity of this finding. These revealed that, when the pathways were reversed or when variables were repositioned in the mediation sequence, no significant indirect effects were observed. Thus, it can be concluded that an athlete’s perceived performance plays a significant role in their judgement of self-worth. In turn this evaluation forms an essential significant component of their SWB.

When considering the first pathway of this relationship, it logical that perceived performance would act to influence self-esteem. Individuals will often seek to enhance and protect their self-esteem by attempting to succeed or avoid failure in life domains that are deemed to be important to the individual (Crocker & Wolf, 2001). In such circumstances a contingent relationship forms between judgements of personal adequacy and performance (Crocker & Knight, 2005; Crocker, Luhtanen & Sommers, 2004). As one would expect, these contingencies are often associated with fluctuation in self-worth (Crocker, Karpinski, Quinn & Chase, 2003). Thus, a performance, within a valued life domain, perceived as positive or negative will enhance or threaten self-esteem. (Bardel et al., 2010).

This contingency becomes particularly salient in elite sport where a significant portion of one’s self-concept is associated with the role of an athlete
(Brewer, Van Raalte & Linder, 1993). As with any form of self-concept, an athletic identity is based on meaning and expectations that are associated with the role as an athlete (Brewer et al., 1993; Stets & Burke, 2000). This includes the strength of identification with the athlete role, the degree of reliance on athletic pursuits, and negative emotional responses to disruptions to this role (Brewer & Cornelius, 2001).

Unsurprisingly, elite athletes typically report higher scores on measures of athletic identity when compared to their recreational counterparts, suggesting their self-concept is more aligned to life as an athlete (Lamont-Mills & Christensen, 2006). Possessing such an identity that is based largely on the ability to perform, and to deliver performances perceived as successful, would likely have important implications on psychological functioning and self-esteem (Callero, 1985; Martin, Eklund & Mushett, 1997). Conversely, performing poorly would likely have negative consequences on self-worth, as confirmed by Callero (1985).

Although the influence of perceived performance on self-esteem is significant in this study, it forms only one component of the overall relationship to SWB. The second pathway of the mediation model demonstrated that self-esteem directly influences SWB. This association was anticipated given the well-established link between self-esteem and SWB (Cheng & Furnham, 2003; Lyubomirsky et al., 2006; Richardson et al., 2009).
It is possible that this positive association is a product of the application of self-esteem as a cognitive resource to support SWB homeostasis (Cummins & Nistico, 2002; Cummins & Wooden, 2014). High levels of self-esteem are typically associated with adaptive outcomes when confronted by potential challenges. A positive sense of self-esteem has been shown to provide more protection from daily stressors (Lee-Flynn, Pomaki, DeLongis, Biesanz & Puterman, 2011) and buffer the effects of anxiety provoking stimuli (Pyszczynski, et al., 2004). Equally, individuals with low levels of self-esteem present with poorer adaptive outcomes indicated by elevated symptoms of depression and negative affect (Orth, Robins, Trzesniewski, Maes & Schmitt, 2009).

The notion that self-esteem serves as a buffer, protecting SWB is further supported when viewing the mediation model as a whole. Here, high self-esteem facilitates positive self-evaluations that assist recovery from a negative perceived performance (Lee-Flynn et al., 2011), thus maintaining a positive sense of SWB. On the other hand, an athlete with low self-esteem would have more difficulty adapting to a poorly perceived performance (Lee-Flynn et al., 2011).

In summary, self-esteem significantly mediated the relationship between perceived performance and SWB. Due to the importance placed on an athletic identity, a contingent relationship likely forms between judgements of personal adequacy and performance. Consequently, changes in perceived performance influence SWB via self-esteem. Within this relationship, the real power of self-esteem is it’s use a psychological resource to support SWB.
The final purpose of this study was to test for potential differences in athlete SWB based on their perceived performance ratings. This was based on previous findings that suggest successful people and athletes report more positive affect, (Lyubomisrky et al., 2005), perceived control, confidence, and less negative affect (Martin, et al., 2011; Nicholls et al., 2008; Smith et al., 1995; Weissensteiner et al., 2012). It was hypothesised that athletes who rated their performance more favourably would display higher levels of SWB when compared to athletes with lower performance ratings. The results obtained in the present study partially confirmed this hypothesis.

Athletes who perceived greater performance ratings were shown to possess significantly higher scores for SWB, self-esteem and sport confidence. These findings, while consistent with previous literature, also provide further support to the mediation model depicted in the second study hypothesis. Here, athletes who perceived their performance more favourably reported significantly higher self-esteem and SWB when compared to their peers. As previously discussed, self-esteem appears to be contingent on perceived performance, which then influences SWB.

In respect to approach coping, it was surprising that no significant differences were observed between perceived performance groups. Descriptively, it was observed that athletes who perceived their performance negatively reported using more approach coping. Although this non-significant finding is contrary to other results (Nicholls et al., 2008; Weissensteiner et al., 2012), it may reflect the
increased use of approach coping strategies, like working harder to overcome an obstacle, to improve a performance that was negatively rated.

In summary, the results partially confirmed the third hypothesis. Athletes who perceived greater performance ratings reported significantly higher self-esteem and SWB scores when compared to their lower performing peers. This finding lends further support for the mediation effect, demonstrating that athletes with more positive self-rated performances also possess higher self-esteem and SWB. When considering differences in the use of approach coping strategies, no significant differences were observed between athlete groups. Descriptively, but not significantly, athletes with lower perceived performances reported using more approach coping, which may be indicative of athletes attempting to respond to a negatively rated performance.

Limitations

As highlighted in study one, a main limitation again is the small sample size. Despite agreements made with two national teams, established relationships with team staff, the use of mobile technology to facilitate ease of survey completion, and the provision of individualised feedback, less than half of the athletes provided data during each day of the selection camp. As a result the study sample consisted of 13 participants, thus limiting the analyses and the generalizability of findings.
Although a number of approaches were employed to limit the time spent completing the questionnaires and ensure the ease of daily survey completion, the use of single item questions to measure specific constructs can also be considered as a limitation. Here, single items were used to measure variables like self-esteem, optimism, and sport confidence. This approach may affect the reliability of participant response and should be considered when interpreting the results. In the future it may be more beneficial to focus on a few specific variables and include the entire questionnaire.

A final limitation pertains to the consideration of psychological skills use in sport that may have play an important role in the maintenance of SWB. Homeostasis theory suggests that possessing well developed coping resources, and employing them more frequently when challenged, contributes to the stability of Homeostatic Protected Mood and SWB (Cummins, 2010; Cummins & Nistico, 2002; Cummins & Wooden, 2014). Within a sport context psychological skills are frequently employed to facilitate performance and cope with adversity (Cox et al., 2010; Sheldon & Eccles, 2005; Smith et al., 1995). Thus, they would likely have some form of relationship with SWB and should be accounted for in a future study.

Conclusions

The purpose of this study was to examine the influence of perceived sport performance on SWB. Data were collected over five days of training and competition at a wheelchair basketball national team selection camp. Although no
significant changes in positive affect were detected over time, the data
demonstrate a pattern of affective asymmetry. Here negative affect appeared to be
more amenable to change in response to positively and negatively rated
performances. Interestingly, such changes in perceived performance were found
to influence SWB via self-esteem. This may be due to the contingent relationship
between judgements of personal adequacy and performance. As a result, athletes
who perceive better sport performance also report significantly higher self-esteem
and SWB.

Although this study highlighted the important relationship between
perceived sport performance, self-esteem and SWB, the findings were limited by
a small sample size and did not consider the influence of sport specific coping
strategies. To further expand on this topic, and address the acknowledged
limitations, study three will now be described. This study considers the influence
of athletic coping skills on SWB and national team selection.
CHAPTER 4

COMPETITION FOR NATIONAL TEAM STATUS:
SUBJECTIVE WELL-BEING AND ATHLETIC COPING SKILLS

INTRODUCTION

Findings from the previous study indicated that the effect of perceived performance on Subjective Well-being (SWB) was mediated by self-esteem. Consequently, athletes who perceived their performances more favourably also reported significantly higher self-esteem and, in turn, higher SWB. What this mediation model illustrates is the importance of psychological resources that contribute to the positive sense of SWB.

Although self-esteem was identified as a major factor linked to SWB for these elite athletes, other psychological resources, developed in a sport context may also contribute to athlete resilience. This third study will evaluate the link between athletic coping skills and SWB. Data are collected from a sample of wheelchair basketball athletes attempting to qualify to represent their nation at world championship and Paralympic events.

The topic of resilience has received considerable attention in the psychology literature. Perhaps the most parsimonious and global definition describes this construct as the process of recovery and adjustment following threat or change (Cummins & Wooden, 2014). This perspective highlights three
important elements namely, exposure to adversity, adaptation, and protective factors (Sakar & Fletcher, 2013). Each of these factors has implications for SWB homeostasis.

Exposure to adversity challenges the maintenance of SWB, thereby activating a response. This reaction includes behavioural activation and the use of psychological resources, like self-esteem (Taylor & Stanton, 2007), optimism (Flach, 1988) and coping strategies (Masten, 2007) to adapt to environmental conditions. These resources not only facilitate adaptation but also serve a protective function to stressors, maintaining a positive sense of SWB (Cummins & Wooden, 2014; Cummins & Nistico, 2002). Given the important role these behavioural and psychological factors play, it could be anticipated that more resources are associated with improved resilience and higher SWB (Graham & Oswald, 2010).

One context that strives to enhance resilience is that of elite sport. Athletes are frequently confronted by adversity over the course of their career (McKay, Niven, Lavallee & White, 2008), including competitive, organisational and personal stressors (Fletcher & Sarkar, 2012). Thus, to attain goals and achieve high performance standards, the capacity to manage such challenges and overcome adversity is crucial (Sarkar & Fletcher, 2013).

A number of strategies have been identified as being potentially important to athlete resilience. Unsurprisingly these often revolve around the maintenance of psychological resources like positive affect (Martin et al., 2011) optimism,
coping strategies and self-belief (Fletcher & Sarkar, 2012; Nicholls et al., 2008; Sarkar & Fletcher, 2014). However, additional sport-specific factors, often described as athletic coping skills (Durand-Busch, Salmela & Green-Demers, 2001; Smith et al., 1995), would likely also contribute to athlete resilience and, therefore, to sport performance.

Several studies have investigated the influence of sport-specific psychological resources and their implications on coping and performance. These factors often include some version of cognitive skills, like focusing and planning, as well as psychosomatic skills, like managing arousal and other aspects like motivation and confidence (Durand-Busch et al., 2001; Smith et al., 1995). Certainly elite athletes consistently out rank their lesser skilled peers in terms of global measures of athletic coping skills (Durand-Busch et al., 2001; Smith et al., 1995; Weissensteiner et al., 2012).

In terms of specific resources, elite athletes also consistently display high levels of self-confidence, focus, and motivation (Durand-Busch et al., 2001; Smith et al., 1995; Sarkar & Fletcher, 2014; Weissensteiner, et al., 2012). Such resources have frequently been associated with improved tolerance to stressors, greater persistence and effective adaptation to setbacks (Sarkar & Fletcher, 2014). It seems highly likely that these sport-specific resources contribute to athlete resilience, which in turn facilitates elite performance.

Given that successful elite athletes appear to possess high levels of effective psychological resources that can be employed under challenge, it is
logical to suggest that they would also contribute to SWB. As previously established in study two, there is an important interaction between sport performance and SWB. Thus, sport-specific resources not only influence SWB via resilience but also by facilitating sport performance.

In summary, athletic coping skills will likely display a significant relationship to SWB. In addition, successful athletes will display higher levels of coping skills and SWB. This third study has been developed to consider this possibility. Two primary objectives have been established. The first is to evaluate the relationship between SWB and psychological skill use. The second is to determine whether differences in SWB and athletic coping skills can be identified based on the result of team selection. As a result of these objectives two hypotheses are as follows:

1. Total athletic coping skills will account for a significant portion of variance in SWB.

2. Athletes who qualify for the national team will display higher levels of SWB, optimism, self-esteem and athletic coping skills compared to their unsuccessful peers.
METHOD

Human Ethics and Organisational Approval

This study was approved by the Deakin University Human Ethics Research Committee (reference number 2011-149).

Following ethics approval, research proposals were submitted to a nation’s male and female national wheelchair basketball teams for review. Upon approval by each team’s coaching and psychology staff, a formal agreement was developed between the researcher and each of the wheelchair basketball teams to establish conditions of participation and project procedures.

Participants

All 35 athletes nominated to attend the national team selection camp were contacted to participate in the study. Of these, 27 provided their informed consent to take part in the project.

The sample comprised 11 male and 16 female wheelchair basketball athletes between the ages of 16 and 40 years, with a mean age of 26.93 (SD = 6.96). Most athletes (74.1 %) indicated they completed between 4 to 15 hours of sport-specific training per week and 70.4 % reported training for 10 or more months of the year. Overall, eight different disability classifications were represented, ranging from increased difficulty performing basketball skills (most
severe impairment) to normal truck movement with no activity limitations (least severe impairment; International Paralympic Committee, 2014). In respect to the onset of disability, most athletes (70.4%) reported that their disability was acquired later in life.

It should be noted that of this participant group, 14 (8 female, 6 male) were successfully selected to their respective national team and 13 athletes (8 female and 5 male) were unsuccessful. No significant differences were observed based on gender and team selection, $\chi^2(1, n = 27) = .05, p = .81$.

**Procedure**

A cross sectional design was used to assess SWB and athletic coping skills for both athletes selected, and not selected, for their respective national team. An informational letter produced in collaboration with the team psychology staff was sent to each athlete who was invited to the camp. This letter included a link to the study website. If an athlete was interested in participating, they accessed the web-link and provided their informed consent. Participants then completed a web-based survey, which enabled them to complete the assessments at home or while overseas.

The assessment period took place approximately two to three weeks prior to the start of the national team selection camp. The questionnaire included measures of SWB and athletic coping skills. In total the assessment took approximately 15 minutes to complete.
Once an athlete submitted their online survey, the principal psychologist for each team was provided with a brief well-being report for that person. This enabled the principal psychologist to follow up the athlete as required.

Measures

The same scales used in study one were used to measure SWB, Homeostatic Protected Mood (HPMood), self-esteem, and optimism. Full details of these scales can be found in the Method section of study one. The new scales are as follows.

The Athletic Coping Skills Inventory-28 (ACSI-28; Smith et al., 1995) measures seven psychological skill subscales: coping with adversity, peaking under pressure, goal setting/mental preparation, concentration, freedom from worry, confidence and achievement motivation, and coachability. Each subscale comprises four questions for a total of 28 items, rated on an end defined 11-point scale. The scales can be summed to yield a personal coping resource score, which reflects a multifaceted psychological skills construct. The measure has demonstrated acceptable internal consistency (α = .62 to .78) and predictive validity (Smith et al., 1995).

Data Analyses

Prior to analyses, the data were checked for acquiescent responses, as recommended by the Personal Well-being Index manual (International Well-
being Group, 2013). No evidence of acquiescent responding was observed and all participant data were retained. All items were then converted to percentage of scale maximum scores (%SM), as described in the previous studies. The data were then checked for univariate and multivariate outliers. No cases met the criteria to be considered a univariate outlier, as all scores fell within three standard deviations of the mean value (Tabachnick & Fidell, 2007). Multivariate outliers were considered using Mahalanobis distance at the critical chi-square value of 30.58 (df = 15, \( p < .01 \)). No scores exceeded this value.

Data were also checked for the assumptions of normality using the Kolmogorov-Smirnov statistic. All variables assessed met assumptions of normality, with the exception of HPMood (\( p = .02 \)), which significantly deviated from normal. This described as being normally positively rated (Cummins, 2010), so negative skew is expected. Fortunately, the statistical techniques employed in this study are reasonably robust. Given the current sample size (\( n = 27 \)) the violation of this assumption should not pose any major problems (Pallant, 2011).

All analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 21.0 (IBM, 2012). Demographic and descriptive statistics were explored for all variables and correlation coefficients were also calculated. Scores obtained from a recent publication (Weissensteiner et al., 2012) examining the athletic coping skills of elite able-bodied athletes were used as a comparison group to provide a context for the present study. To account for differences in the measurement scales employed, scores for the able-bodied group were also converted to %SM values.
To evaluate the relationship between SWB and athletic coping skills, hierarchical regression analyses were conducted. Based on the findings of study two, self-esteem, and HPMood were also included in the regression equation.

ANOVAs compared the SWB and athletic coping skills of athletes selected, or not selected, to the national team. As previously discussed in study two, multiple ANOVAs were employed because the effect of team selection (independent variable) on each measured variable is not likely uniform (Tabachnick & Fidell, 2007). This is based on the fact that the data were collected prior to team selection and it is unclear where potential differences may exist, and their direction.

Finally, the relationship between team selection and athletic coping skills was investigated using a logistic regression. This was based on the psychological skills that demonstrated the largest effect sizes from the ANOVA results. Each variable was evaluated to determine its significance in the regression and the probability of each athlete being selected to the national team.

**RESULTS**

**Descriptive Statistics**

The assessment was completed approximately two to three weeks prior to the beginning of the selection camp. Table 3.1 displays the mean scores and standard deviations for the measured variables.
Table 3.1

*Mean scores and standard deviations of dependent variables (n = 27)*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWB</td>
<td>55.71</td>
<td>97.14</td>
<td>80.47</td>
<td>12.67</td>
</tr>
<tr>
<td>HPMood</td>
<td>46.67</td>
<td>93.33</td>
<td>73.95</td>
<td>13.83</td>
</tr>
<tr>
<td>Self Esteem</td>
<td>36.00</td>
<td>100.00</td>
<td>81.40</td>
<td>18.16</td>
</tr>
<tr>
<td>Optimism</td>
<td>.00</td>
<td>100.00</td>
<td>71.11</td>
<td>24.12</td>
</tr>
</tbody>
</table>

Consistent with the results of studies one and two, average SWB scores were above the normative range of the general population (76.7-73.7; Cummins et al., 2013). As expected from this result, most athletes also reported high levels of self-esteem and optimism. It should be noted, however, that one athlete reported very low levels of optimism and a below average SWB score.

In respect to athletic coping strategies, the mean scores and standard deviations are shown in Table 3.2. To provide some context for these scores, they were compared to values reported by a small group of highly skilled, able-bodied cricket athletes who had attained national representation (Weissensteiner et al., 2012).
Table 3.2

Between group descriptive statistics for athletic coping skills

<table>
<thead>
<tr>
<th>Variable</th>
<th>Wheelchair Basketball Athletes (n = 27)</th>
<th>Able-Bodied Cricket Athletes (n = 11; Weissensteiner, et al., 2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Adversity</td>
<td>61.29</td>
<td>16.32</td>
</tr>
<tr>
<td>Peaking</td>
<td>68.14</td>
<td>14.91</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>55.18</td>
<td>17.30</td>
</tr>
<tr>
<td>Concentration</td>
<td>67.87</td>
<td>12.53</td>
</tr>
<tr>
<td>No Worry</td>
<td>50.09</td>
<td>21.27</td>
</tr>
<tr>
<td>Confidence</td>
<td>75.09</td>
<td>13.52</td>
</tr>
<tr>
<td>Coachability</td>
<td>75.09</td>
<td>16.31</td>
</tr>
<tr>
<td>Total ASCI-28</td>
<td>64.69</td>
<td>10.10</td>
</tr>
</tbody>
</table>

Evaluation of individual subscales reveals that the wheelchair basketball athletes reported significantly lower scores for freedom from worry ($t = -1.79, p = .04$) and coachability ($t = -2.37, p = .01$) than their able-bodied counterparts. However, overall, there were no differences in total athletic coping skills ($t = .38, p = .35$). Although specific skill differences were observed between athlete groups, it may actually reflect the demands of each sport and the priorities of each group’s respective psychological training program.

Pearson correlation coefficients are presented in Table 3.3. As expected, there are strong positive correlations between SWB, HPMood, self-esteem, and optimism. There are also positive correlations between SWB, and some of the athletic coping skills (coachability, confidence, and concentration), as well as the overall athletic coping skill score. This finding is suggestive of the important relationship between psychological resources aimed at resilience and SWB.
Table 3.3

Inter-item correlations of all dependent variables (n = 27)

<table>
<thead>
<tr>
<th>Variable</th>
<th>SWB</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
<th>9.</th>
<th>10.</th>
<th>11.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. HPMood</td>
<td>.83&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Self-Esteem</td>
<td>.86&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.75&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Optimism</td>
<td>.70&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.70&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.85&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Adversity</td>
<td>.44&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.45&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.36</td>
<td>.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Peaking</td>
<td>.18</td>
<td>.20</td>
<td>.14</td>
<td>.22</td>
<td>.45&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Goal Setting</td>
<td>.23</td>
<td>.47&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.19</td>
<td>.22</td>
<td>.55&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.42&lt;sup&gt;b&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Concentration</td>
<td>.66&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.69&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.52&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.68&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.44&lt;sup&gt;b&lt;/sup&gt;</td>
<td>0.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. No Worry</td>
<td>.22</td>
<td>.17</td>
<td>.27</td>
<td>.32</td>
<td>-.06</td>
<td>-.10</td>
<td>-.28</td>
<td>-.07</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Confidence</td>
<td>.62&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.70&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.59&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.66&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.55&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.62&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.68&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Coachability</td>
<td>.50&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.34</td>
<td>.22</td>
<td>.39&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.10</td>
<td>.25</td>
<td>.49&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.28</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>12. Total ACSI-28</td>
<td>.61</td>
<td>.64&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.54&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.76&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.61&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.63&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.80&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.30</td>
<td>.84&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.64&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>correlation is significant at the .01 level (2 tailed)

<sup>b</sup>correlation is significant at the .05 level (2 tailed)

Athletic Coping Skills and SWB

The first objective of this study was to evaluate the relationship between SWB and psychological skill use. It was hypothesised that total athletic coping skills would account for a significant portion of variance in SWB. The results of a regression analysis confirmed this hypothesis, where total athletic coping skills accounted for 37% of the variance in SWB [$F (1, 25) = 15.07, p = .001$].

Although this result is statistically significant, athletic coping skills must be considered among other known determinants of SWB, to account for any variance it shares with them and extract its unique contribution to the understanding of SWB. One such variable is HPMood, which has been shown to account for approximately 64% to 66% of the variance in SWB (Blore et al., 2011; Davern et al., 2007). A second variable is self-esteem, which was shown in the second study to play an important role in the SWB of elite athletes.
To explore the contribution of athletic coping skills to SWB in the context of these other variables, a hierarchical regression was conducted. Although the current sample size \((n = 27)\) is somewhat below the recommended 15 cases per variable for social science research (Pallant, 2011; Stevens, 2012), the significant differences observed suggests that this analysis was not likely underpowered. A summary is shown in Table 3.4

**Table 3.4**

*Regression Coefficients \((n = 27)\)*

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>B</th>
<th>Beta</th>
<th>(t)</th>
<th>(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HPMood</td>
<td>.38</td>
<td>.41</td>
<td>3.16</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>Self-Esteem</td>
<td>.39</td>
<td>.55</td>
<td>4.20</td>
<td>.001</td>
</tr>
<tr>
<td>2</td>
<td>HPMood</td>
<td>.34</td>
<td>.38</td>
<td>2.43</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Self-Esteem</td>
<td>.38</td>
<td>.55</td>
<td>4.11</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>Total ACSI-28</td>
<td>.07</td>
<td>.05</td>
<td>.43</td>
<td>.67</td>
</tr>
</tbody>
</table>

With HPMood and self-esteem entered into the model at step 1, the result was significant \([R^2 = .82, F (2, 24) = 54.31, p < .001]\) with self-esteem recording the highest beta value \((.55, p < .001)\). After the entry of total athletic coping skills in step 2, the model was found to still account for 82 % of the variance in SWB \([F (3, 23) = 35.04, p < .001]\). Total athletic coping skills did not make a significant contribution to SWB.

To further support the regression model, the regression was recalculated using a bootstrap procedure based on 1,000 samples. The results confirm the initial analysis. Here again, total athletic coping skills did not make a significant contribution to SWB when considering the influence of self-esteem and HPMood.
Consistent with the original calculation, self-esteem made the largest contribution to the model ($B = .38, se = .10, p = .006$) with 95% confidence intervals above zero (.21 - .62).

In summary, self-esteem was most closely associated with SWB. The influence of athletic coping skills on SWB was negated when both HPMood and self-esteem are considered. Although this regression model included a small sample ($n = 27$), the effect size was very large ($f^2 = 4.56$) and was replicated using a bootstrap procedure based on 1,000 samples.

**National Team Status**

The second aim of this study was to determine whether differences in SWB and athletic coping skills could be found between athletes selected, or not selected for their national team. It was hypothesised that athletes who qualified for their national team would have displayed higher levels of SWB, optimism, self-esteem and athletic coping skills prior to the training camp.

To test this assertion analyses of variance were completed. Prior to analysis, Levene’s Test revealed that all variables, with the exception of optimism ($F = 6.02, p = .02$), met the assumption of homogeneity of variance. Based on this result the Welch and Brown-Forsythe test was used as suitable alternative (Pallant, 2011) for optimism. Both values (Welch; Brown-Forsythe = $F = 4.80, p = .04$) were identical and have been presented in Table 3.5, along with the other comparisons.
As shown in Table 3.5, individuals selected to their national team displayed significantly higher levels of optimism prior to the start of the selection camp. These differences represented a moderate effect size (.17). Although not significant, these athletes also reported higher scores for SWB, HPMood, and self-esteem. It remains possible that these differences might achieve statistical significance with greater power in a larger sample.

The second series of ANOVAs tested for differences in athletic coping skills between athletes who were selected and non-selected for their respective national team. Assumptions of homogeneity of variance were met prior to analysis. The results shown in Table 3.6 reveal several significant differences between groups.
Table 3.6

Athletic coping skill scores of selected and non-selected athletes

<table>
<thead>
<tr>
<th></th>
<th>Selected (n = 14)</th>
<th>Non-Selected (n = 13)</th>
<th>F</th>
<th>p</th>
<th>Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adversity</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>67.32</td>
<td>13.60</td>
<td>54.81</td>
<td>17.00</td>
<td>4.49</td>
</tr>
<tr>
<td>Peaking</td>
<td>75.71</td>
<td>14.45</td>
<td>60.00</td>
<td>10.80</td>
<td>10.11</td>
</tr>
<tr>
<td>Goal Setting</td>
<td>65.00</td>
<td>14.24</td>
<td>44.61</td>
<td>13.98</td>
<td>14.05</td>
</tr>
<tr>
<td>Concentration</td>
<td>70.17</td>
<td>11.66</td>
<td>65.38</td>
<td>13.41</td>
<td>.99</td>
</tr>
<tr>
<td>No Worry</td>
<td>46.25</td>
<td>21.98</td>
<td>54.23</td>
<td>20.52</td>
<td>.95</td>
</tr>
<tr>
<td>Confidence</td>
<td>81.96</td>
<td>11.89</td>
<td>67.69</td>
<td>11.34</td>
<td>10.15</td>
</tr>
<tr>
<td>Coachability</td>
<td>74.11</td>
<td>15.67</td>
<td>76.34</td>
<td>17.54</td>
<td>.123</td>
</tr>
<tr>
<td>Total ACSI-28</td>
<td>68.64</td>
<td>8.95</td>
<td>60.44</td>
<td>9.81</td>
<td>5.16</td>
</tr>
</tbody>
</table>

It can be seen that the largest effects were found among variables measuring peaking under pressure, goal setting and confidence (.28-.36). Athletes who were selected for their national team reported significantly higher scores for each of these variables. Moderate effect sizes were also found for coping with adversity and total athletic coping skill score (Total ACSI-28: .15-.17). Again, successful athletes reported significantly higher scores for these variables.

In order to predict national team selection based on psychological skill use, a logistic regression was performed. Due to the small sample size, a limited number of variables could be entered into the regression equation. As previously noted, approximately 15 participants per variable are recommended to perform regression analyses for research in social science (Pallant, 2011; Stevens, 2012). As such, two were selected based on the effect sizes shown in Table 3.6, where the large effect sizes were observed for goal setting (.36), and peaking under pressure (.29).
The Hosmer-Lemeshow Goodness of Fit Test provided support for the model with a non-significant result ($p = .12$). The result of the regression was statistically significant [$\chi^2 (2, 27) = 15.30, p < .001$] and accounted for 43 % (Cox and Snell R squared) to 57 % (Nagelkerke R squared) of the variance in team selection. In total, 89 % of cases were correctly classified. Upon further examination, goal setting was the only variable that made a unique, statistically significant contribution to the model (Wald = 4.66, $p = .03$). For every additional goal setting point, athletes were 1.1 times more likely to qualify for the national team.

This result is further supported by the use of a bootstrap procedure based on 1,000 samples. Here goal setting was the only variable to make a significant contribution to the model ($B = .09, se = 3.29, p = .006$) with 95 % confidence intervals above zero (.02-17.94).

In conclusion, the results provided partial support for the first hypothesis. Although athletic coping skills had a significant relationship with SWB, this became non-significant when considered in the presence of self-esteem and HPMood. In this model, self-esteem demonstrated the strongest relationship with SWB.

The second study hypothesis was also partially supported where significant differences in optimism and avoidance coping emerged between selected and non-selected athletes. However, no differences were found among the remaining variables. In respect to athletic coping skills selected athletes
demonstrated significantly higher scores for all skills with the exception of concentration, freedom from worry, and coachability. Interestingly, goal setting was the strongest predictor of being selected.

**DISCUSSION**

The purpose of the third study was to assess the relationship between athletic coping skills and SWB in the context of national team selection. The study sample consisted of 27 elite wheelchair basketball athletes; as such it is acknowledge that the findings may not generalize beyond the study sample. Cognizant of this factor, the following sections attempt to account for the results observed.

The first hypothesis tested was that total athletic coping skills would account for a significant portion of variance in SWB. This was based on the application of SWB homeostasis theory (Cummins, 2010) to the context of elite sport. Here, elite athletes employ a set of sport-specific psychological resources like focusing, motivation, confidence and arousal (Durand-Busch et al., 2001; Smith et al., 1995) when facing environmental challenges. Such resources not only facilitate adaptation in such circumstances (Sarkar & Fletcher, 2014) but would also contribute to the resilience of SWB. The results obtained partially supported this assertion.

On an individual level, a significant relationship between total athletic coping skills and SWB was observed. However, when considered alongside other
resources like HPMood and self-esteem, this relationship was no longer significant. This finding is logical when considered among previous literature. Past analysis have shown that HPMood accounts for 64-66 % of the variance in SWB (Blore et al., 2011; Davern et al., 2007). Self-esteem on the other hand is thought to play an essential role in the maintenance of SWB (Cummins & Nistico, 2002; Cummins & Wooden, 2014). Therefore, in the present study it is likely that any contribution of athletic coping skills towards SWB is best accounted for by shared variance between HPMood and self-esteem.

Although the relationship between HPMood and SWB was significant, self-esteem made the largest contribution to the regression model. Based on the previous literature this finding was not anticipated, however, it further highlights the important relationship between self-esteem and athlete SWB. As previously discussed in study two, possessing an identity that is based largely on the ability to perform has significant implications for self-esteem (Callero, 1985; Lee-Flynn et al., 2011; Martin et al., 1997). In this context, athletic activities appear to either endorse or contradict positive self-perception, which then may influence SWB.

The findings from the regression suggest athletic coping skills might operate to support HPMood and self-esteem, which then facilitates SWB. In support of this possibility, sport-specific psychology skills characterised by focusing techniques, goal setting, and the management of cognitive and somatic anxiety have often been described as essential to facilitating resilience and successful performance (Sakar & Fletcher, 2014). However, these skills actually
represent a set of cognitive and behavioural strategies that form the basis of the internal resources applied overcome challenges and maintain SWB.

Based on this logic, these specific strategies would not only contribute to self-esteem and HPMood but are also crucial components of optimism and control. For instance, goal setting, a task focused on actively planning how to overcome challenges and engaging in specific behaviour, not only contributes to motivation and self-esteem (Weinberg & Butt, 2014) but also is the essence of primary control via approach coping (Roth & Cohen, 1986). Another strategy like imagery not only enhances performance and self-efficacy (Hammond, Gregg, Hrycaiko, Mactavish & Leslie-Toogood, 2012) but also likely facilitates optimism when confronted by that specific challenge.

In summary, the relationship between athletic coping skills and SWB was diminished when considered with self-esteem and HPMood. This may suggest that these psychological skills represent specific cognitive and behavioural strategies that reflect the internal resources responsible for the resilience of SWB.

The second hypothesis tested whether athletes who qualified for their respective national wheelchair basketball team would display higher SWB, optimism, self-esteem and athletic coping strategies when compared to their non-selected peers. This was based on previous findings that suggested successful athletes report higher scores for these variables (Martin et al., 2011; Nicholls et al., 2008; Weissensteiner et al., 2012). The results of the study partially confirmed this hypothesis.
Athletes selected to their respective national team reported significantly more optimism prior to training camp, however no significant differences were found in respect to SWB, HPMood or self-esteem. Although unexpected, this may be attributed to a product of the small sample size. Descriptively the successful athletes showed higher mean and less variation scores for SWB, HPMood and self-esteem, which is consistent with the previous literature (Martin et al., 2011; Nicholls et al., 2008; Weissensteiner et al., 2012) and the findings of study two. It remains possible that these differences may have achieved statistical significance with greater power in a larger sample.

In respect of athletic coping skills, successful athletes were found to score significantly higher on a global measure of sport-specific coping skills. These athletes also scored significantly higher on subscales measuring goal setting, coping with adversity, peaking under pressure, and confidence when compared to their unsuccessful peers. This is unsurprising given that such skills are thought to facilitate athlete resilience (Sarkar & Fletcher, 2014) and consistently differentiate highly skilled athletes from their lesser skilled peers (Durand-Busch et al., 2001; Smith & Christensen, 1995; Smith et al., 1995; Weissensteiner et al., 2012).

Based on the available data, two specific athletic coping strategies may have played an important role in facilitating athlete resilience and performance. Goal setting, and peaking under pressure, respectively, demonstrated the largest differences between successful and unsuccessful athletes. Of these variables, goal setting was the only skill that significantly increased the potential of being selected to the national team by 1.1 times. Even though this value seems
negligible, the smallest of margins can separate competitors. As such, athletes need to utilize every opportunity and skill to enhance their performance (Mills, Munroe & Hall, 2001).

Although it is not known why the ability to plan and monitor behaviour was more influential over the other skills, evidence for the performance enhancing effects of goal setting is fairly robust. Goal setting has consistently demonstrated to be an effective strategy to enhance motivation and performance by directing attention to relevant cues, assisting in the development of learning strategies, and increasing effort and persistence (Locke, Shaw, Saari & Latham, 1981; Weinberg & Butt, 2014). Thus, the ability to direct behaviour and enhance perseverance was an important difference between athlete groups.

Interestingly, no differences were observed for subscales measuring concentration, freedom from worry, and coachability. This suggests that it may not always be possible or necessary to possess elevated scores on these subscales to facilitate athlete resilience and performance. Indeed, it is likely that some level of cognitive and somatic anxiety is facilitative to performance (Acharya & Morris, 2014). However, if worry becomes chronic and overwhelming, performance will undoubtedly suffer.

The same logic can be applied to coachability and concentration. Athletes require the ability to respond positively to criticism and instruction from coaches. However it is unlikely that this feedback will always be taken in stride. The subscale measuring concentration indicated that both athlete groups possessed a
high level of focusing and distraction management skills. This may again suggest that once skill levels reach a certain point their relative contribution to resilience and performance is inconsequential.

In summary, the second study hypothesis was partially supported. Athletes selected to their respective national team reported significantly more optimism when compared to their unsuccessful peers. Descriptively the successful athletes showed higher mean scores SWB, HPFmood and self-esteem. Successful athletes also reported significantly higher athletic coping skill scores with the largest differences found for goal setting and peaking under pressure. Of these, goal setting was the only variable to increase the odds of national team selection.

**Limitations**

As discussed previously, a main limitation of this study is the small sample size. Despite having established relationships with team staff, and the use of mobile technology to facilitate ease of survey completion and reduce athlete burden, a total of 27 athletes agreed to participate in the project. As a result, the analyses and the generalisability of findings were limited.

A second limitation pertains to demographic variables that were not controlled for during the study. As previously noted, a small sample, consisting of 11 male and 16 female of elite wheelchair basketball athletes were recruited for the study. Although there were no gender differences based on team selection, some literature has suggested that such differences may exist in respect to
psychological skill use (Cox et al., 2010). For example, confidence and cognitive restructuring may play a more important role in sport performance for female than male athletes (DeFrancesco & Burke, 1997; Hammermeister & Burton, 2004). Thus, it is recommended that future studies attempt to confirm gender differences based on psychological skill use and if feasible, control for such variables.

Conclusions

The purpose of this study was to assess the relationship between athletic coping skills and SWB in the context of national team selection. Individually, there was a significant relationship between athletic coping skills and SWB. However, this was diminished in the presence of self-esteem and HPMood. This may suggest that these skills represent specific cognitive and behavioural strategies responsible for the resilience of SWB. The context of team selection also yielded several interesting results. Successful athletes reported significantly more optimism and total athletic coping skills, but their largest advantage was found for goal settings, which increased the odds of national team selection.

Although this study was the first known attempt to examine the relationship between the athletic coping skills and SWB of elite athletes with disabilities, several limitations were identified. Consistent with the previous studies the findings were limited by a small sample size. Another limitation was that gender differences based on psychological skill use were not accounted for. Thus, future studies should consider the influence of such factors.
CHAPTER 5

GENERAL DISCUSSION

Summary

The aim of this thesis was to explore the SWB of elite athletes with disabilities in an attempt to understand how the context of elite sport influences their psychological functioning. Using homeostasis theory as the guiding framework, three linked studies were developed to consider this topic.

The initial pilot study evaluated athlete SWB in the months before and after the London 2012 Paralympic Games. It was observed that this group of Paralympic athletes possessed a level of SWB above the normative population range. Their high level of SWB remained stable in the lead-up to the Games. However, following the conclusion of competition, SWB and psychological resource use decreased, signalling a return to everyday life. This decrease did not support the notion of post-Paralympic depression, but rather indicated a period of post-Paralympic normalisation.

Given the pilot study was conducted before and after a major competition, it was not possible to evaluate the influence of perceived self-performance on SWB. Therefore, this became the priority of the second study. Data were collected over five days of training and competition at a wheelchair basketball national team selection camp. During this time period athlete SWB remained
stable despite fluctuations in self-rated performance. Although a significant relationship was found between perceived performance and SWB, it was mediated by self-esteem. As a result, athletes who perceived better sport performances also reported significantly higher self-esteem and SWB.

The relationship between athlete self-esteem and SWB highlighted the importance of psychological resources on SWB maintenance. However, specific psychological skills developed in a sport context were not previously considered as coping skills. Thus, the third study documented the relationship between athletic coping skills and SWB, in the context of national team selection. On an individual level there was a significant relationship between athletic coping skills and SWB. However, this was diminished in the presence of self-esteem and HPMood, suggesting that psychological skills represent specific cognitive and behavioural strategies that reflect the internal resources responsible for the resilience of SWB.

The results of this third study also suggested that sport-specific psychological skills contributed to athlete performance. It was found that athletes who qualified for their national team displayed significantly higher levels of athletic coping skills, with the largest differences related to goal setting, peaking under pressure, and confidence. Of these, goal setting was the only psychological skill that significantly increased the odds of being selected to a national wheelchair basketball team.
Main Findings

Although each study showed a series of unique observations regarding the SWB of elite athletes with disabilities, the cumulative results highlight two main themes. The first theme pertains to the level of SWB demonstrated by this sample group. Across each study it was consistently observed that on average athletes reported high levels of SWB. Here, mean SWB scores ranged from 79 to 82.9 points out 100. When compared to population norms (73.7 – 76.7; Cummins et al., 2013), it becomes clear these elite athletes with disabilities are a high functioning group of individuals.

This finding is important because the majority of literature concerned with the SWB of people with disabilities suggests they function at a level equal to or below that of the able-bodied general population (Albrecht & Devlieger, 1999; Chow et al., 2005). Although such findings have often been attributed to the strength of challenges associated with having a disability (Emerson et al., 2009; Lucas, 2007; Oswald & Pwdthavee, 2008), the results of this thesis suggest that elite athletes with disabilities have adapted and thrived in the face of such obstacles.

As previously discussed over the course of each study, factors like a sense of purpose in life (Schueller & Seligman, 2010), increased physical activity (Gerber et al., 2010) and sport-specific support as an athlete (Sotiriadou & Shilbury, 2009) may have contributed to their high SWB. However, this finding can be likely attributed to the robustness of psychological resources like self-
esteem, optimism, approach/ avoidance coping and sport psychology skills that contribute to the homeostatic maintenance system.

The second theme relates directly to this proposition. Across each study, significant relationships were established between psychological resources and SWB. However, of these resources it can be suggested that self-esteem likely played the most important role in athlete SWB. For example, in study two, self-esteem was found to mediate the relationship between perceived performance and SWB. In study three, self-esteem was shown to account for the largest amount of variance in SWB scores. Clearly, self-esteem can be highlighted as being an important variable in determining athlete SWB.

This is unsurprising when considering the reality of being an elite athlete. These individuals often associate a significant portion of their self-concept with the role of an athlete (Brewer et al., 1993; Stets & Burke, 2000), which is intimately connected to the ability to perform and to deliver performances perceived as successful (Callero, 1985; Martin, et al., 1997). A contingent relationship likely then forms between judgements of personal adequacy and performance (Crocker & Knight, 2005; Crocker et al., 2004). Based on this reasoning, it can then be proposed that elite athletes function in an environment that either confirms or challenges their sense of self-worth, which then operates to influence their SWB. This would then suggest that close attention be paid to the self-esteem of elite athletes when considering their SWB.
Practical Implications

Based on the findings presented, several important practical applications can be made. The first pertains to the monitoring of athlete SWB. It is broadly assumed that for an athlete to deliver an optimal performance, they generally require a stable mental state. For example, athletes who experience increased negative affect also display significant reductions in blood oxygen-level dependent activation in the right premotor cortex, and sensorimotor cortex (Davis et al., 2008). The decreased activation in brain areas responsible for motor action would undoubtedly impair performance. Therefore, establishing a reporting system, similar to that employed in the present study, would enable psychologists and coaches to monitor the SWB of athletes ensuring it remains within the set-point range, with the aim of facilitating sport performance.

A second practical implication can also be derived from important relationship observed between athlete self-esteem and SWB. As previously discussed, a contingent relationship likely exists between athlete performance and self-esteem, which then directly relates to SWB. Although this contingency can be viewed positively when sport performances are successful, it is likely that the close relationship between self-esteem and performance can be detrimental when performance suffers. Based on this assertion it can be proposed that psychologists should assist athletes develop other areas of competency that contribute to self-worth so that the perception of being a valuable person does not solely hinge on sport performance.
A final implication relates to the use of sport specific psychological skills. It was observed in the third study that athletes who achieved national team status displayed significantly higher scores on skills measuring goal setting, peaking under pressure, and confidence compared to their unsuccessful peers. This finding would suggest that psychological skill training programs should focus on cognitive, behavioural, and acceptance based techniques related to focusing, relaxation training, confidence building, and goal setting to facilitate sport performance.

**Limitations**

The major limitation consistent across studies was the small sample size. Despite various agreements and careful planning to ensure ease of completion, each study comprised only a small group of athletes who provided complete data during the assessment period. This was a significant limiting factor for the types of statistical analyses that could be completed. For example, because the participant group in study one was small, non-parametric methods were employed, which was a major deviation from the original parametric data analysis plan. The small sample size also reduced the statistical power of each test used and may have increased the probability of making a Type 1 error (Pallant, 2011).

The small sample size also influenced the generalisability of the results. In each study the participant group consisted of English speaking athletes from two westernized countries who competed in a limited variety of sports. Although study one included some variation in athlete disciplines, the next two studies were
focused solely on wheelchair basketball athletes. It is possible that a larger sample, with more variety in culture and sport disciplines could produce a different set of results. Thus, the findings of this thesis may only pertain to the athlete groups studied.

Although the small sample size was a significant limiting factor, the consistency of this difficulty across each study may be indicative of the challenge associated with conducting research among highly specialised elite athletes. Despite best efforts to develop relationships, agreements and minimise the burden of questionnaire completion, athlete participation was below expectations. It is suggested that this may be due to athlete/organisational inexperience with research and the lack of a direct relationship with coaches and athletes.

For example, one organisation indicated that this research project was the first time they had been approached to conduct assessments with their athletes. Moreover, despite formal agreements, there was clear resistance to implement anything new from an outsider. Had there been established relationships with coaches and athletes, it may have been more likely that such research would have been included as a component of the sport science program. In the future, researchers should take these factors into account.

Future Directions

The results of this thesis have provided a set of novel of findings concerning the SWB of elite athletes with disabilities. However, given the
limitations of the small sample size, it is recommended that further research be conducted to evaluate the reliability of these findings across a larger and more diverse group of athletes. Continuing along this line of inquiry it would be interesting to note whether differences in SWB can be observed between athletes of various sports and disability types. Collecting data from different disability and athlete groups would provide further validation for the results presented in this thesis. Additional comparisons could be made to able-bodies athletes to evaluate for potential differences in psychological resources that would contribute to SWB resilience and adaptation to life events.

Another important area of research could also be focused on the mediating role of self-esteem when considering the relationship between perceived performance and SWB. It would be valuable to determine if this model is applicable to other athlete groups and perhaps other performance based situations in educational and occupational settings. Expanding on these results, researchers may also be interested in determining the relative influence of objective and perceived performance results on self-esteem and SWB. The findings could have important implications for directing the focus of resources to targets that support SWB.

Finally, research should also be conducted to examine how sport-specific athletic coping skills might contribute to the resilience of the homeostatic system maintaining SWB. For instance future studies might consider the relationship between athletic coping skills and psychological resources, like self-esteem,
optimism and HPMood. It may also be useful to determine whether greater coping skills are also associated with higher levels of SWB during times of stress.

Conclusions

The findings reported in this thesis provide a novel perspective when considering the SWB of elite athletes with disabilities. In general, these athletes represent a very high functioning group within the population. They not only report high levels of SWB but also appear to have robust psychological resources that support adaptation to environmental challenges and athletic success. This would suggest that important lessons in resilience could be learned from this high profile group. Understanding their superiority in this regard has important implications for the development of interventions targeted not only at athletes but also the wider community.
REFERENCES


APPENDIX A

DEAKIN UNIVERSITY
Human Ethics Research
Office of Research Integrity
Research Services Division
70 Elgin Road Burwood Victoria
Postal: 221 Burwood Highway
Burwood Victoria 3123 Australia
Telephone: 03 9251 7123 Facsimile 03 9244 6981
research-ethics@deakin.edu.au

Memorandum

To: Prof Robert Cummins
   School of Psychology

B

cc: Mr Thomas Hammond

From: Deakin University Human Research Ethics Committee (DUHREC)

Date: 01 August, 2011

Subject: 2011-119

Examining the subjective wellbeing of paralympic athletes with physical and intellectual disabilities
Please quote this project number in all future communications

The application for this project was considered at the DUHREC meeting held on 25 July 2011.

Approval has been given for Mr Thomas Hammond, under the supervision of Prof Robert Cummins, School of Psychology, to undertake this project from 1/08/2011 to 1/08/2015.

The approval given by the Deakin University Human Research Ethics Committee is given only for the project and for the period as stated in the approval. It is your responsibility to contact the Human Research Ethics Unit immediately should any of the following occur:

• Serious or unexpected adverse effects on the participants
• Any proposed changes in the protocol, including extensions of time.
• Any events which might affect the continuing ethical acceptability of the project.
• The project is discontinued before the expected date of completion.
• Modifications are requested by other HRECs.

In addition you will be required to report on the progress of your project at least once every year and at the conclusion of the project. Failure to report as required will result in suspension of your approval to proceed with the project.

DUHREC may need to audit this project as part of the requirements for monitoring set out in the National Statement on Ethical Conduct in Human Research (2007).

Human Research Ethics Unit
research-ethics@deakin.edu.au
Telephone: 03 9251 7123
APPENDIX B

STUDY 1 QUESTIONNAIRE

Section 1

Please complete the following information about yourself:

1. Last name (Text Box)
2. First name: (Text Box)
3. Age: (Text Box)
4. Gender:
   Male
   Female
5. Home country:
   Australia
   Canada
   United Kingdom
   United States of America
6. Are you a member of your nation’s 2012 Paralympic Team competing in London?
   Yes
   No
   Uncertain
7. What is your IPC Classification? (text box)
8. Please select the sport you will be competing in at the London 2012 Paralympic Games.

<table>
<thead>
<tr>
<th>Archery</th>
<th>13. Rowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Boccia</td>
<td>15. Shooting</td>
</tr>
<tr>
<td>7. Equestrian</td>
<td>17. Table Tennis</td>
</tr>
<tr>
<td>8. Football 5-a-Side</td>
<td>18. Volleyball</td>
</tr>
<tr>
<td>10. Goalball</td>
<td>20. Wheelchair Fencing</td>
</tr>
<tr>
<td>12. Powerlifting</td>
<td>22. Wheelchair Tennis</td>
</tr>
</tbody>
</table>

9. On average, how many hours a week do you train for your sport?
   <4
   4-9
   10-15
   16-20
   21+

10. During the past year, how many months did you train for your sport?
   <4
   4-5
   6-7
   8-9
   10+

11. Was your disability present from birth?
   Yes
   No
Personal Well-being Index

Thinking about your current life circumstances, how satisfied are you.

<table>
<thead>
<tr>
<th></th>
<th>No satisfaction</th>
<th>Complete satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied are you with your standard of living?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your health?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with what you are achieving in life?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your personal relationships?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with how safe you feel?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with feeling part of your community?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your future security?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

Homeostatic Protected Mood Assessment

How you generally feel?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>How contented do you generally feel?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How Happy do you generally feel?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>How alert do you generally feel?</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
Approach Avoidance Coping

How much do you agree that when something bad happens?

<table>
<thead>
<tr>
<th>Statement</th>
<th>Do not agree at all</th>
<th>Completely agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I work hard to overcome it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I ignore it by thinking about other things.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I look for different ways to achieve the goal.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I put lots of time into overcoming it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I relax and don’t think about it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I work out what caused it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I realize I didn’t need to control it anyway.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I tell myself it doesn’t matter.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I learn the skills to overcome it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I don’t feel disappointed because I knew it might happen.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I make an effort to make good things happen.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

DASS Depression Scale

How much did each statement apply to you over the past week?

<table>
<thead>
<tr>
<th>Statement</th>
<th>No satisfaction</th>
<th>Complete satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>I couldn’t seem to experience any positive feeling at all</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I found it difficult to work up the initiative to do things</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I felt that I had nothing to look forward to</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I felt down-hearted and blue</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I was unable to become enthusiastic about anything</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I felt I wasn’t worth much as a person</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I felt that life was meaningless</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
Rosenberg Self-Esteem Scale

How much do you agree with the following statements?

<table>
<thead>
<tr>
<th>Do not agree at all</th>
<th>Completely agree</th>
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<tbody>
<tr>
<td>On the whole, I am satisfied with myself.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<td>I feel that I have a number of good qualities.</td>
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</tr>
<tr>
<td>I take a positive attitude toward myself.</td>
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</tr>
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Life Orientation Test

How much do you agree with the following statements?

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<thead>
<tr>
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<tbody>
<tr>
<td>In uncertain times, I usually expect the best</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>I'm always optimistic about my future</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
</tr>
<tr>
<td>Overall, I expect more good things to happen to me than bad</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
</tr>
</tbody>
</table>
APPENDIX C

STUDY 2 QUESTIONNAIRE

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>How satisfied are you with your standard of living?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your health?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with what you are achieving in life?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your personal relationships?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with how safe you feel?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with feeling part of your community?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How satisfied are you with your future security?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How contented do you generally feel?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How happy do you generally feel?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>How alert do you generally feel?</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>I am satisfied with my performance today</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>I am confident I will perform well</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>I am always optimistic about my future.</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>When something bad happens I put lots of time into overcoming it.</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>When something bad happens I relax and don't think about it.</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>On the whole, I am satisfied with myself.</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>I felt that I had nothing to look forward to</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
<tr>
<td>I am concerned that I may not do as well in the training and competition as I could</td>
<td>0  1  2  3  4  5  6  7  8  9  10</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX D

STUDY 3 QUESTIONNAIRE

Demographic Information

Please complete the following information about yourself:

1. Last name (Text Box)

2. First name: (Text Box)

3. Age: (Text Box)

4. Gender: M  F

5. Are you currently a member of the Canadian Wheelchair Basketball National Team?
   Yes
   No

6. Do you play professional wheelchair basketball?
   Yes
   No

7. On average, how many hours a week do you train for your sport?
   <4
   4-9
   10-15
   16-20
   21+

8. During the past year, how many months did you train for your sport?
   <4
   4-5
   6-7
   8-9
   10+

9. How confident are you that you will be selected as a member of the National Team?
   0 10
   Not at all confident
   completely confident

10. What is your IPC Classification? (Text Box)

11. Was your disability present from birth?
   Yes
   No
### Athletic Coping Skills Inventory

Select how often you have these experiences when competing

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>On a daily or weekly basis, I set very specific goals for myself that guide what I do.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I get the most out of my talent and skills.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When a coach tells me to correct a mistake I’ve made, I tend to take it personally and feel upset.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When I am competing, I can focus my attention and block out distractions.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I remain positive and enthusiastic during competition, no matter how badly things are going.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I tend to play better under pressure because I think more clearly.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I worry quite a bit about what others will think about my performance.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I tend to do lots of planning about how to reach my goals.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I feel confident I will play well.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When a coach criticizes me, I feel upset rather than helped.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>It is easy for me to keep distracting thoughts from interfering with something I am watching or listening to.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I put a lot of pressure on myself by worrying about how I will perform.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I set my own performance goals for each practice.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I don’t have to be pushed to practice or play hard; I give 100%.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Scores</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>If a coach criticizes or yells at me, I correct the mistake without getting upset about it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I handle unexpected situations very well.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When things are going badly, I tell myself to keep calm, and this works for me.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>The more pressure there is during competition the more I enjoy it.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>While competing, I worry about making mistakes or failing coming through.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I have my own game plan worked out in my head long before the competition begins.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When I feel myself getting too tense, I can quickly relax my body and calm down.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>To me, pressure situations are challenges I welcome.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I think about and imagine what will happen if I fail or screw up.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I maintain emotional control no matter how things are going for me.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>It is easy for me to direct my attention and focus on a single object or person.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>When I fail to reach my goals, it makes me try even harder.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I improve my skills by listening carefully to advice and instruction from coaches.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
<tr>
<td>I make fewer mistakes when the pressure is on because I concentrate better.</td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>
Personal Well-being Index

Thinking about your current life circumstances, how satisfied are you?

<table>
<thead>
<tr>
<th>How satisfied are you with your standard of living?</th>
<th>No satisfaction</th>
<th>Complete satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How satisfied are you with your health?</th>
<th>No satisfaction</th>
<th>Complete satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
<td></td>
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<table>
<thead>
<tr>
<th>How satisfied are you with what you are achieving in life?</th>
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<tr>
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<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>How satisfied are you with how safe you feel?</th>
<th>No satisfaction</th>
<th>Complete satisfaction</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<th>How satisfied are you with feeling part of your community?</th>
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<tbody>
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<table>
<thead>
<tr>
<th>How satisfied are you with your future security?</th>
<th>No satisfaction</th>
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</tr>
</thead>
<tbody>
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Homeostatic Protected Mood Assessment

How you generally feel?

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<tr>
<th>How contented do you generally feel?</th>
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<tbody>
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<td></td>
<td>0 1 2 3 4 5 6 7 8 9 10</td>
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</tbody>
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<table>
<thead>
<tr>
<th>How Happy do you generally feel?</th>
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<td>0 1 2 3 4 5 6 7 8 9 10</td>
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<tr>
<th>How alert do you generally feel?</th>
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<td>0 1 2 3 4 5 6 7 8 9 10</td>
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Rosenberg Self-Esteem Scale

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<tr>
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Life Orientation Test

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<tr>
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<td>0 1 2 3 4 5 6 7 8 9</td>
<td>10</td>
</tr>
<tr>
<td>Overall, I expect more good things to happen to me than bad</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td>10</td>
</tr>
</tbody>
</table>