Positive emotions, Engagement, Relationships, Meaning, and Accomplishment (PERMA):
Exploring the Dimensions of Well-Being in Regular Physical Activity

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Submitted in partial fulfilment of the requirements of the degree of Griffith Business
School Undergraduate Honours majoring in Sport Management

May 2013
Abstract

Physical activity builds on physical health, just like positive psychology actively builds on psychological well-being. This study aims to further define and understand the dimensions of well-being in the context of physical activity and their contributions to life satisfaction. The methodology employed to fulfil this aim involved the use of a questionnaire—distributed both online and in-person—which measured five proposed elements of subjective well-being: Positive emotions, Engagement, Relationships, Meaning and Accomplishment (PERMA) in the context of the participants’ main physical activity: sport or exercise. There were 132 males and 183 females aged between 18 and 81 participating in this study, recruited from various locations on the Gold Coast. Their main physical activity was self-categorised into two groups, sport and exercise. Multiple regression analysis was used to examine the contribution of PERMA to life satisfaction. Relationships and Meaning as elements of well-being in both sport and exercise significantly contributed to life satisfaction among participants of regular physical activity. The dimensions of well-being in exercise participation contributed to 18% of the variance in life satisfaction, and the dimensions of well-being in sport participants contributed to 28% of the variance in life satisfaction. The current research provides useful ways in which sport and exercise practitioners can leverage relationships and meaning in physical activity to contribute to life satisfaction, such as fostering camaraderie, designing partnered exercises, and investigating and realising meaning in life among regular physical activity participants.
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Acknowledgements

I would like to thank Dr. Kevin Filo for his guidance, support, patience and encouragements throughout the duration of this research. Thanks for believing in me when all hell broke loose and I thought I was not going to make it; without you I would not have come this far.

Thank you to Dr. Margaret Kern for sharing your knowledge and insight, and providing the manuscript that formed the basis of the instrument used in this study.

Thank you to Katie Cheng from Griffith University Badminton club, Emma Bunn from Griffith University Surfers Paradise Rowing club, Jane Schinkel from Greendoggs Basketball club, Aaron Alsop from Gryphons Volleyball, Master Angus Uebergang from Warrior Hapkido, Barbara Collins from Sports Super Centre and Kellie Morris from the Active and Healthy Program for allowing me to distribute my questionnaire to their members and attendants.

Special thanks to Aaron Alsop, Barbara Collins, Ava Carter and Colin Hart for their selfless donation of time and effort in helping me collect questionnaires.

Thank you to Maria Sanchez for always welcoming me next door with a cup of tea, warmth and home-made sweets in those ridiculous hours of the morning.

Thanks to Griffith University and Gold Coast Get Active and Healthy for their support in this research.

Finally, thanks to my partner Billy Noonan, who is capable of turning any meal into charcoal, and any desperation into hope.
Statement of Originality

This work has not previously been submitted for a degree or diploma in any university. To the best of my knowledge and belief, the dissertation contains no material previously published or written by another person except where due reference is made in the dissertation itself.

Fan Li
Chapter 1: Introduction

Well-being is the positive feeling, thinking and functioning of an individual, organisation or society, beyond the absence of pain, illnesses, diseases or malfunctioning (Diener, Sapyta, & Suh, 1998; Keyes, 2002; Ryff & Singer, 1998; Seligman & Csikszentmihalyi, 2000). Governments around the world are increasingly focussing on the health and well-being of their citizens, realising that money alone does not make people more happy nor healthy (Diener & Seligman, 2004; Forgeard, Jayawickreme, Kern, & Seligman, 2011; Huppert & So, 2013). Since the year 2000, the Australian Government has been spending more money each year treating health conditions such as cardiovascular disease, musculoskeletal disorders and mental health problems. In 2010, the burden of disease on the Australian Economy was 80 billion AUD (Australian Institute of Health and Welfare, 2013). Rates of obesity have doubled from 1980 to 2008 worldwide, with over 1.4 billion people considered obese (World Health Organisation, 2013). Clearly, more needs be done to reduce the burden of disease in Australia and around the world, which would be beneficial for humanitarian and economic reasons.

To achieve better health and well-being among their citizens, governments need to take a proactive, rather than reactive, approach in prevention and building on the positive physical and psychological aspects of individuals. For the purpose of this study, ‘well-being’ refers to the psychological and intangible aspects of positive mental states; and ‘health’ refers to the physical aspects of positive functioning. The World Health Organization recommends moderate to intensive physical activity at least three times per week for optimal health and prevention of obesity (World Health Organisation, 2011). Regular physical activity can also prevent chronic diseases like diabetes, cancer,
DIMENSIONS OF WELL-BEING IN PHYSICAL ACTIVITY

hypertension, depression and osteoporosis (Warburton, Nicol, & Bredin, 2006), thereby contributing to greater health and well-being.

Similar to the objectives of regular physical activity, psychologists are now finding ways to build on the positive aspects of everyday individuals, helping them increase well-being and life satisfaction instead of waiting for the onset of mental illnesses. In 1998, the president of the American Psychological Society (APA) introduced the term ‘positive psychology’, which lends itself to the study of happiness, well-being, high functioning and human flourishing. Since then, there has been a large number of studies devoted to the concept, including papers authored by Fredrickson (2001), Howell (2009) and Seligman, Steen, Park, and Peterson (2005). Eight related journals have been established between the years 2000 and 2011, including Journal of Positive Psychology, International Journal of Wellbeing, Applied Research in Quality of Life etc. The vast amount of research has covered many topics and ideas in which several general agreements have been reached.

First, well-being can be measured subjectively through personal feelings reported by an individual as well as objectively through observations made by a third party. Second, well-being is best captured as a multidimensional construct including both hedonic and eudaimonic values. Third, well-being can be studied on many different levels, such as the group level (civic virtues that move individuals toward better citizenship), the individual level (positive individual traits like courage and perseverance), subjective level (subjective experiences like contentment and satisfaction) and contextual (in the workplace or family contexts).

Positive psychology has already been applied to the context of the workplace, education, nursing, the army, as well as the promotion of public health to improve people’s lives (Aspinwall & Tedeschi, 2010; Cherubini, 2009; Cornum, Matthews, & Seligman,
2011; Froman, 2010; Kobau et al., 2011; Seligman, Ernst, Gillham, Reivich, & Linkins, 2009). These applications reflect the importance of proactive rather than reactive approaches to increase well-being. In other words, the focus needs to be place on improving well-being. Existing research suggest that physical activity produces positive moods, reduces levels of anxiety, increases self-concept, improves perceived health and promotes social integration (Biddle, Boutcher, & Fox, 2000). The importance of physical activity in positive psychology is well documented, and a thorough understanding of this knowledge allows practitioners and governments to design strategies to optimise health and well-being.

However, well-being in the context of physical activity has been sporadically studied and loosely defined. Measurements of self-esteem, positive and negative emotions, levels of stress, vitality, interest, depression, life satisfaction have all been used as operational definitions of well-being (Biddle, 1996; Lundqvist, 2011). Furthermore, researchers have not distinguished between sport and exercise as distinct physical activities.

This research extends positive psychology to the context of physical activity by defining the various dimensions of well-being in physical activity and examining the contribution of these dimensions to life satisfaction among regular sport and exercise participants. Well-being is conceptualised using Seligman’s (2011) well-being theory, stating that increases in five dimensions of well-being—the frequency of positive emotions, the intensity of engagement, the support of positive relationships, the sense of meaning, and accomplishment—results in an increase in human flourishing. In addition, distinctions will be made between sport participation and exercise participation, allowing practical advice to be made for practitioners on which dimensions of well-being in their physical activity can be leveraged. The results will also help governments design strategies to promote well-being through physical activity.
Purpose Statement

The purpose of this study is to examine which of Seligman’s (2011) five dimensions of well-being—Positive emotions, Engagement, Relationships, Meaning and Accomplishment—in sport and exercise contribute to life satisfaction among regular physical activity participants on the Gold Coast. Comparisons will be made between participation in sport and participation in exercise. This study extends positive psychology to the context of physical activity and provides definitions to various dimensions of well-being in physical activity, and investigates the possible differences between sport and exercise in their contribution to life satisfaction. The findings will help practitioners and governments promote well-being through leveraging specific dimensions of well-being in physical activity.

Research Questions

This research looks at the contributions of five dimensions of well-being in the context of two types of physical activities to life satisfaction, which leads to the following three main research questions that guide the course of this study:

Research question 1: Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of sport contribute to life satisfaction?

Research question 2: Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of exercise contribute to life satisfaction?

Research question 3: Do the contributions of Positive emotions, Engagement, Relationships, Meaning and Accomplishment to life satisfaction differ between sport and exercise contexts?
**Research Methods and Context**

To answer the research questions presented above, this research used a quantitative, non-experimental approach to gather data on participants in various physical activities on the Gold Coast. A questionnaire was developed through modifying the items in a measurement of Seligman’s five dimensions of well-being (Butler & Kern, in preparation) and adopting it to the physical activity context. A paper and an online version of the questionnaire were distributed at 12 locations over a 3-week period. The data collection process is detailed in the Methods section of this document.

Respondents to the paper questionnaire were recruited through Griffith University sporting clubs, the Gold Coast City Council Active and Healthy program, Griffith University on-campus gymnasium, Runaway Bay Sports Super Centre, and Griffith Dental Clinic. The online version of the questionnaire was emailed to members of the Griffith Rowing club. In addressing the research questions, participants were asked to self-identify with either sport or exercise participation and respond to the items accordingly. Data was processed using multiple regression analysis, and the results were compared between sport and exercise participation.

**Outline of Document**

The next chapter reviews the relevant literature in positive psychology and physical activity, which provides readers with necessary background information for this research. Chapter 3 details the method used in this study, including research design, questionnaire development, target participants, recruitment of participants and techniques used to analyse data. Chapter 4 presents the results of the analysis, and Chapter 5 discusses the main findings, theoretical and practical implications, limitations and future directions of this study. Next, research in positive psychology, physical activity, and well-being are reviewed.
Chapter 2: Literature Review

Positive Psychology and Well-being

Positive psychology is the recent movement of Psychology oriented towards optimising the human living experience beyond the elimination of mental illnesses. While traditional psychology focuses on recognising and treating mental malfunctions such as depression, anxiety, and personality disorders, positive psychologists aim to increase well-being, achieve and maintain human flourishing, and help people to live a good life above and beyond the absence of psychological disorders (Seligman, Linley, Joseph, & Boniwell, 2003). Positive psychology aims at being relevant and applicable to everyday individuals rather than only to the diagnosed populations. Although only recently recognised officially as a sub-discipline within the American Psychological Association (APA) (Seligman & Csikszentmihalyi, 2000), Positive Psychology benefits from a rich history in the study of well-being.

The first documented investigations of well-being were initiated by ancient Greek philosophers in their search of what humans ultimately pursue in life. The view that all humans pursue happiness—the desire to experience pleasure and avoid pain—was attributed to Aristippus as the father of hedonism (Ryan & Deci, 2001; Waterman, 1993). Aristotle, on the other hand, held the belief that doing what is worth doing and fulfilling the proper human function is the goal in life and leads to well-being, which gave rise to eudaimonism (Ryan & Deci, 2001; Waterman, 1993). The two traditions of well-being evolved separately over time, with modifications and expansions of definitions (Huppert & So, 2013). In general, studies in the hedonic tradition have used the terms happiness, subjective well-being and life satisfaction; while those concerning the eudaimonic tradition preferred to use the terms social well-being and human flourishing (Dodge, Daly, Huyton,
& Sanders, 2012; Keyes, 1998; McDowell, 2010; Seligman, 2011). Next, the developments of both traditions are presented.

**Hedonic well-being.** Early scientific studies of happiness attempted to discover the causes and correlates of happiness. It was found that income, social status and physical health were insufficient to explain the variations in subjective experiences of happiness, instead personality emerged as a strong predictor (Diener, Suh, Lucas, & Smith, 1999). Extroverts tended to be happier than introverts and people high on neuroticism while longitudinal studies found that even significant life events such as winning the lottery or losing a limb only temporarily affect people’s happiness (Brickman, Coates, & Janoff-Bulman, 1978). This led scientists to believe in the hedonic treadmill theory, and any effort made to increase happiness will always be overridden by the individual’s inherit trait.

However, the hope to increase hedonic well-being was reignited when Diener, Lucas, and Scollon (2006) shed light on a new perspective, collaborating evidence that happiness set points are not neutral, only partially dependent on temperament, and can change under certain circumstances.

The nature of happiness in the hedonic tradition also evolved from a focus on affective states to the inclusion of a cognitive component. Bradburn (1969) proposed that happiness has two dimensions—positive and negative affect—and that it is the balance of these dimensions that constitutes happiness. Following this stream of thought, Diener (1984) initiated the use of the term ‘subjective well-being’, which included an emotional (or affective) and a cognitive (or judgemental) component. The additional cognitive component was termed life satisfaction, or the evaluation of one’s life as a whole according to his/her own criteria. Subjective well-being has since been extensively researched, including its association with cultural factors, thought processes, adaptation to events, refinements of
measurements and definitions, as well as the causes and effects on a variety of variables (Diener, 2000). Recent advances in the field have expanded subjective well-being to include both hedonic and eudaimonic conceptions (Diener, Wirtz, Tov, Kim-prieto, Choi, & Oishi, 2010), which led to the necessity of understanding eudaimonic well-being.

**Eudaimonic well-being.** The eudaimonic tradition of well-being was first made by Jahoda (1958) by analysing and summarising clinical and sociological theories on what a healthy person should be. Jahoda identified six key elements of positive functioning: ‘attitude of an individual toward his own self’, ‘autonomy’, ‘environmental mastery’, ‘integration’, ‘perception of reality’ and ‘self actualisation’. Around the same time, Rogers (1963) arrived at similar conclusions through rethinking the end-product of client-centred therapy. The result, which he called the ‘fully functioning person’, is someone able to fulfil his potential as a human organism, who is realistic, self-enhancing, able to socialise adequately and creative. Perhaps influenced by both the aforementioned theorists, Ryff (1989) proposed six dimensions of psychological well-being: autonomy, environmental mastery, personal growth, positive relationships, purpose in life and self-acceptance. For Csikszentmihalyi (1990), well-being is the outcome of an optimal experience called flow, characterised by intense concentration on the present, merging of action and awareness, loss of self-consciousness, sense of personal control, distortion of temporal perception, and experience of the activity as intrinsically rewarding. Another point of view was derived from needs theory, with Ryan and Deci (2001) specifying that well-being is achieved through satisfying innate human needs of autonomy, competence, and relatedness. Together, these researchers in eudemonic well-being have provided a strong basis for the current multidimensional view of well-being in Positive Psychology.
Well-being is multidimensional. Despite the independent developments of hedonic and eudaimonic traditions of well-being, influential theories in the twenty-first century have come to the conclusion that both perspectives need to be included to create a multidimensional perspective. For example, Keyes’ (2002) measure included six dimensions of eudaimonic well-being, a hedonic well-being (life satisfaction), and another five dimensions of social well-being. Another example is the Authentic Happiness theory, stating that happiness can be achieved through obtaining aesthetic pleasure, being engaged in activities, and meaning in life (Seligman, 2002). The theory was later revised because of a need to include a broader concept of well-being, therefore the new Well-Being Theory recognises the pursuit of positive emotions, engagement, relationships, meaning and accomplishment as pathways to human flourishing (Seligman, 2011). Huppert and So (2013) examined national data across 23 European countries and developed an operational definition for flourishing, which encompasses many key features mentioned in previous theories of well-being. They concluded that in order to be qualified as flourishing, a person had to experience positive emotions together with four of the five positive characteristics (emotional stability, vitality, optimism, resilience and self-esteem) and three of the four aspects of positive functioning (engagement, competence, meaning, positive relationships). These advances show the multidimensionality in developing practical and worldwide measures of well-being.

The above literature highlights the development of key concepts in positive psychology from which a few important conclusions can be drawn. Agreements are being reached that well-being is multidimensional and a collection of measures using subjective and objective methods are required to capture the construct (Forgeard et al., 2011; Huppert & So, 2013). Subjective well-being is limited to the self-perceptions of well-being and
measured exclusively using self-rated measures. Apart from the multidimensionality, some theorists also emphasise the importance of assessing well-being on a global and contextual level, or specific domains of individuals’ lives (Diener et al., 1999; Wilson, Longley, Muon, Rodgers, & Murray, 2007). Global well-being is the overall summary from all aspects of the individual’s life, often termed life satisfaction. In comparison, contextual well-being refers to well-being in certain, important contexts of the individual’s life, such as the workplace or family environment. Studying contextual well-being can provide the ways in which global well-being can be optimised (Diener et al., 1999). The current research is focussed on the dimensions of subjective well-being within the context of regular physical activity and their contributions to life satisfaction utilising well-being theory.

**Well-Being Theory and the PERMA Elements**

Well-being theory is a multidimensional theory designed to provide detail into the different aspects of flourishing. As supported by recent research, well-being or flourishing involves both doing and feeling good, which invites a multidimensional approach (Forgeard et al., 2011; Huppert & So, 2013). Seligman and Csikszentmihalyi (2000) proposed that well-being operates on subjective, individual and group levels. The subjective level includes the experience of happiness, satisfaction and self-perceived well-being; the individual level comprises the expression of positive traits such as love, perseverance and forgiveness; the group level involves the execution of responsibility, altruism and civility. Well-being theory is aimed at the individual level in that each of the five elements directly contributes to well-being and was chosen by individuals for their intrinsic values. For an illustration of how well-being theory is derived, see Figure 1.1. The outlook for this theory is to provide a dashboard view of well-being and create profiles for individuals to assist in their pursuit of flourishing (Seligman, 2011). Five dimensions, or
elements, make the basis of well-being theory: Positive emotions, Engagement, Relationships, Meaning, and Accomplishment (PERMA). In order to apply well-being theory in this study, it is essential to first understand what each element represents. Below is a brief introduction to the five PERMA elements, beginning with the first element, Positive emotions, which form the basis of happiness and gave rise to an important aspect of subjective well-being.

Figure 1.1 The origins of well-being theory
**Positive emotions.** As an element with an extended history in philosophy, experiencing positive emotions is seen as equivalent to happiness in the hedonic tradition of well-being (Diener, Larsen, Levine, & Emmons, 1985). The hedonic tradition states that happiness constitutes wholly of pleasure, or the feel-good factor, that can be either momentary or longer-lasting, as opposed to the eudaimonic tradition which emphasised the importance of striving for one’s potential to achieve optimal well-being (Ryan & Deci, 2001). Emotions are different from mood and affect in their duration, origin and classification (Alpert & Rosen, 1990; Diener, Smith, & Fujita, 1995). Moods tend to be longer lasting and usually of unknown origin, whereas emotions and affect are shorter and have a clear cause (Diener et al., 1995). Mood and affect can be classified along two dimensions: valence (sometimes called hedonic tone or pleasantness) and intensity (or arousal) (Diener, Larsen, et al., 1985). Emotions can also be classified into these dimensions yet it is more common to refer to their type, such as joy, anger, sadness and excitement (Alpert & Rosen, 1990). Research has found that positive and negative emotions are not mere opposite ends of a spectrum; instead they are distinct dimensions possibly using different physiological mechanisms (Fredrickson, 2001). The Positive and Negative Affect Scale (PANAS) (Watson, Clark, & Tellegen, 1988) and the Scale of Positive and Negative Experience (SPANE) (Diener, Wirtz, Tov, Kim-prieto, Choi, Oishi, et al., 2010) have been developed and used as markers of subjective well-being across a variety of contexts (Deniz & Işik, 2010; Herero & Extermera, 2010; Li, Bai, & Wang, 2013; Parker, Strath, & Swartz, 2008; Silva & Caetano, 2013).

The experience of positive emotions has many benefits. People who are frequently happy have been rated by others as more likeable, more sociable, more successful, and even more likely to go to heaven (Lyubomirsky, King, & Diener, 2005). In fact, the mechanisms
of why positive emotions are central to well-being were described in Frederickson’s (2001) broaden-and-build theory, explaining that positive emotions broaden the attention and prompt individuals to build on physical, intellectual, social and psychological resources.

Although the experience of positive emotions is the hallmark of happiness and life satisfaction, well-being is not composed of positive emotions alone. Indeed, evidence suggests that positive emotions do not correlate well with eudaimonic measures of well-being (Huppert & So, 2013). In fact, some experiences contribute to well-being without individuals feeling any emotions at all. This concept is termed Engagement in well-being theory and is detailed in the following sections.

**Engagement.** Engagement is the state of consciousness when being involved in an activity of interest, ranging from the mere physical participation to full concentration where the self and activity become one (Csikszentmihalyi, 1990). Engagement is studied widely in research dealing with motivation, performance and well-being, with typical definitions varying depending on the field of study. From an organisational perspective, practitioners and researchers have largely agreed that employee engagement embodies ‘attachment’, ‘commitment’ and ‘organisational citizenship’ which are key concepts that produce behaviour directly benefiting the organisation (Robertson & Cooper, 2010). In the classroom, Fredricks, Blumenfeld, and Paris (2004) proposed three major sub-components of school engagement, namely behavioural, emotional, and cognitive engagement. Another form of engagement is mindfulness, which entails being aware of internal and external processes in the present moment (Brown & Ryan, 2003).

In well-being theory and most positive psychology literature, engagement is identified with the experience of flow proposed by Csikszentmihalyi (1990). Flow is characterised by intrinsic interest in the activity, a clear goal and a sense of control over the
task at hand, merging of action and awareness, a loss of sense of time and complete concentration and immersion in the experience (Csikszentmihalyi, 1990). High levels of engagement are closely related to high levels of subjective well-being (Kanste, 2011; Robertson & Cooper, 2010), and low levels of engagement put individuals at risk of a decrease in well-being (Frankl, 1966).

The elements introduced above (Positive emotions and Engagement) are solely experienced by the individual and can only be measured subjectively. From here, the rest of the elements in well-being theory (Relationships, Meaning and Accomplishment) can also be gauged using objective or outside measures (Seligman, 2011). Engagement describes the internal or personal experiences, whereas relationships with others focus on the external and interpersonal activities in which the quality of interactions determines well-being.

**Relationships.** Having good relationships with significant others is essential to well-being (Diener & Seligman, 2002). Quality relationships provide support and care when one is in need, as well as a source of happiness in itself (Camfield, Choudhury, & Devine, 2009). Even reliable and extensively tested measures of life satisfaction, married couples were consistently found to be happier than being single or divorced (Hultell & Gustavsson, 2007). Relationships can be viewed differently in different cultures. In Eastern cultures, relationships are valued more than the individual, where the self is viewed as part of the society. In the West, however, individual successes have greater value than societal harmony (Diener & Oishi, 2005).

The crucial role of relationships in well-being cannot be overstated. Seligman (2011) pointed out that nearly all positive experiences occur when there are others around. Some argue that social relationships are the single most important factor in predicting well-being. Keyes (1998) introduced social well-being as a specific form of well-being including social
integration, social contribution, social coherence, social actualisation and social acceptance. Similarly, Ryan and Deci (2000) emphasised, in part of their self-determination theory, that feelings of relatedness is an innate human need which promotes effective function of individuals, groups, and society. Reis, Sheldon, Gable, Roscoe, and Ryan (2000) further applied this theory and found that meaningful talk and feeling understood by people in the interaction can best fulfil relatedness needs on a daily basis. Concepts similar to relationships, social integration, psychosocial health and the like have been included in major theories exploring happiness and well-being (Huppert & So, 2013). The World Health Organisation included relationships as a component in assessing quality of life (Bonomi, Patrick, Bushnell, & Martin, 2000).

Significant relationships, such as close family and friends, can give meaning to life, and having meaning also leads to well-being (Demir, 2010). The next element in Well-Being Theory entails the ways that meaning contribute to well-being, introduced in the following section.

**Meaning.** Meaning is the sense of direction or purpose in life. Similar to the concept of engagement, meaning also consists of affective, behavioural and cognitive components. Scannell, Allen, and Burton (2002) found that the affective component was most directly associated with self-esteem and other measures of well-being. In a study of personality and meaning in life, Schnell and Becker (2006) found that Extroversion, Openness, and even to some degree Neuroticism predict the level of meaning. They also noted that some measurements of meaning overlap other constructs such as happiness and satisfaction and should be used with caution.

Meaning plays an important role in well-being. Having meaning in life is associated with fewer incidents of depression and higher well-being (Ho, Cheung, & Cheung, 2010;
Scannell et al., 2002), whereas lack of purpose in life in turn was found to be linked with hopelessness and depression (Joaquín, José Francisco, & Esteban, 2009; Pearson & Sheffield, 1989). Frankl (1966) recognised meaning as the single most important trait in Nazi survivors and gave rise to the branch of existentialism. Since meaning is a distinct but related construct to overall well-being (King, Hicks, Krull, & Del Gaiso, 2006), the Meaning in Life Questionnaire has been developed to assess this aspect (Steger, Frazier, Oishi, & Kaler, 2006). For these reasons meaning was in the original ‘Authentic Happiness’ theory proposed by Seligman (2002). In well-being theory, meaning in life represents believing and serving in something greater than the self, which has both a subjective and objective standard (Seligman, 2011). When one can live a life congruent with their values and serving others, a sense of accomplishment may also arise. Next, the element of Accomplishment is introduced.

**Accomplishment.** Accomplishment is having achieved a goal through agreed upon standards. Another closely related construct is competence, which refers to an organism’s ability to function effectively in the environment (White, 1959). Achievement goal theory and self-determination theory are often utilised in relation to studies in the fields of sport, organisations, and education to explain and predict the process of goal attainment, performance, motivation and well-being (Elliot & Thrash, 2001; Frederick & Ryan, 1995; Kaplan & Maehr, 1999). Achievement goals theory identifies two types of goals, Task and Ego, and their relationships with psychological outcomes (Elliot & Thrash, 2001). Task goals were also referred to as mastery or learning goals, where the aim is to improve the self according to one’s own standards, and are associated with better concentration, coping strategies, creativity, positive emotions and greater well-being. On the contrary, Ego goals were also called ability or performance goals, and are related to avoidance and maladaptive
coping strategies (Elliot & Thrash, 2001). Self-determination theory also prevails in the
motivation literature, stating that well-being is enhanced through satisfying innate human
needs to strive for feelings of competence, autonomy, and relatedness, and together these
form the basis for goal setting and sense of accomplishment (Deci & Ryan, 2000). The use
of these two theories makes up the link between achievement and well-being in many
different aspects or domains of life.

As the topic of well-being receives escalating interest in empirical research, studies
on regular physical activity also shifted focus from physical health to psychological well-
being. While neither age nor income correlated significantly with well-being or health in
developed countries (Borghesi & Vercelli, 2012), physical activity, instead, had a broad
positive effect on both (Rasciute & Downward, 2010). Indeed, apart from direct health
benefits, physical activity can also induce positive moods, increase self-esteem, fulfil innate
human needs, and generate a sense of achievement (e.g. Biddle, Boutcher, & Fox, 2000;
Mutrie & Faulkner, 2004). The next section provides an understanding of the ways in
which physical activity relates to well-being.

The Effects of Regular Physical Activity on Well-Being

Physical activity can reduce incidents of cardiovascular diseases, diabetes and
cancer (World Health Organisation, 2011), also helping alleviate mental illnesses such as
stress, anxiety, depression, and cognitive functioning (Biddle & Mutrie, 2008). Regular
physical activity has been shown to have a positive effect on well-being. Biddle et al. (2000)
stated that one of the functions of physical activity is to improve psychological well-being
of the general public in order to prevent the onset of mental illnesses. Indeed, people who
exercise frequently have been shown to have less psychological issues, are better integrated
in society, and have greater perceived health (Hassmén, Koivula, & Uutela, 2000).
Evidence in the literature suggest that being physically active is better for well-being than being sedentary (Jürgens, 2006; Ku, Fox, Chen, & Chou, 2011), for this reason it is safe to assume that regular physical activity is an important aspect of a physically and psychologically healthy life, and that understanding well-being in the context of regular physical activity can thus provide ways to understand human flourishing. Therefore, this study will use well-being theory to explore the various dimensions of well-being in the context of regular physical activity.

**Using PERMA Elements to Measure Well-Being in the Context of Physical Activity**

There are three reasons for using well-being theory in the present study. First, its multidimensional structure better captures the construct of well-being than single-dimension measures (Forgeard et al., 2011), and can hence offer insight into the different aspects of physical activity. Following the first reason, well-being theory is adaptable to measure well-being in specific contexts of an individual’s life, therefore aligning with the purpose of this research in examining well-being in physical activity. And finally, measuring well-being along the five PERMA dimensions can provide a dashboard view on well-being for individuals, hence making it useful for practitioners to increase well-being through enhancing specific elements. Next, the adaptation of well-being theory to the context of physical activity is discussed, beginning with the experience of positive emotions.

**Positive emotions.** Exercise can induce feelings of positive emotions via the physiological system (Acevedo & Ekkekakis, 2006). The close relationship between exercise and following experience of positive emotions has been empirically validated and earned the term ‘feel-good’ factor of exercise (Hyde, Conroy, Pincus, & Ram, 2011). Such an effect has helped alleviate symptoms of depression and increased exercise adherence. In
sport, the role of positive emotions and their contribution to well-being is less studied; instead literature in the field focuses on the effects of sport participation on positive feelings and social experiences (Coalter, 2005; Gould, 2002; Wankel, 2000). This project will thus bring a different perspective to the field and contribute to the understanding of well-being through exploring how positive emotions are experienced in the context of sport and exercise. Herein, Positive emotion is conceptualised as the joy, content and positive feelings experienced during participation in regular physical activity.

**Engagement.** Engagement had been shown to increase well-being in both exercise and sport. Simple exercises like walking can increase well-being more when using engagement strategies designed to focus attention on environmental stimuli (Duvall, 2011). On the sports field, the idea of flow is described as the optimal experience representing well-being (Jackson & Csikszentmihalyi, 1999). The current project defines Engagement as the amount of interest, level of absorption and the degree in which one loses track of time during their regular physical activity.

**Relationships.** Perhaps the greatest contributor from sport to well-being would be the camaraderie brought on through sharing an understanding and appreciation for the game. It has been suggested that sport may help with social integration through forming relationships with the community (Faulkner & Taylor, 2005). The United Nations Sport for Development and Peace embraced sport’s ability to connect people and communities, and potential to empower, motivate and inspire and for these reasons the department has utilised it to promote harmony, understanding and well-being among different cultures and nations (United Nations Sport for Development and Peace, 2008). The relationships component in the context of exercise is less researched, nevertheless some studies indicate that having an exercise partner increases motivation and adherence (Diehl, 2001), congruent with previous
evidence that good relationships contribute to better well-being. In the present study, Relationships are defined as *the support, caring, feelings of love, and the quality of personal relationships amongst people in the individual’s usual physical activity environment*.

**Meaning.** The meaning through sport participation can also enhance well-being. Filo, Funk, and O’Brien (2009) explored the meaning of being involved in charity sport, from which being part of something greater than the self, alignment with self-endorsed values, and sense of achievement emerge as three key themes. Other studies on meaning of sport participation, however, related meaning in sport similar to motivation or a ‘reason’ to participate (Battista, 1990; Seippel, 2006). In the exercise context, some associate health and accomplishment with exercise, while others related it with guilt and anxiety (Bulley, Donaghy, Payne, & Mutrie, 2009). Opportunities exist for studying meaning in regular physical activity. This research explores the role of meaning in contribution to well-being in the regular physical activity context, therefore extending the knowledge in the field to help better understand well-being. Meaning is conceptualised as *the sense of purpose and direction in life derived through participation in the individual’s chosen regular physical activity, and the extent of feeling that participation is valuable and worthwhile*.

**Accomplishment.** Experiencing accomplishment in the context of sport and exercise are arguably one of the most important aspects of contextual well-being (Mechanic & Hansell, 1987). The Basic Needs Satisfaction in Sport Scale (Ng, Lonsdale, & Hodge, 2011) and the Psychological Need in Exercise Scale (Wilson, Rogers, Rodgers, & Wild, 2006) have been developed separately to assess the role of accomplishment in sport and in exercise. This research can find potential differences between the two and gain greater insight into SWB in the context of physical activity, where Accomplishment is
conceptualised as *the feelings of progress and achievement of important goals in sport or exercise, and the ability to handle personal responsibilities through regular participation in physical activity.*

The above outline has highlighted the essence of Positive emotions, Engagement, Relationships, Meaning, and Accomplishment in the context of regular physical activity, which is then applied to the contexts of sport and exercise in this project. Naturally, well-being may be experienced differently depending on the type of physical activity performed. A couple of studies distinguished between two major types of physical activities—sport and exercise—and discovered that participation in sport was associated with intrinsic motivation and improved well-being, while exercise was related to extrinsic motivation and poorer well-being (Chatzisarantis & Hagger, 2006; Frederick & Ryan, 1993). To date, investigations clearly delineating and including both ‘sport’ and ‘exercise’ as two distinct concepts are scarce, yet Forsyth (2008) emphasised that they are different and should be considered separately especially in studies related to well-being. This research investigates possible differences between ‘sport’ and ‘exercise’ using the definition outlined by the Australian Bureau of Statistics (ABS) (2008). The next section details this definition and provides the boundaries in which these terms are used in the present study.

**Distinguishing between Sport and Exercise**

The ABS (2008) defines *exercise* as “Any structured and/or repetitive physical activity performed or practised where the main intention is to achieve improved physical fitness.” And *sport* as “An activity involving physical exertion, skill and/or hand-eye coordination as the primary focus, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations.”
Although there are some degrees of overlap between the two concepts, *sport* and *exercise* are clearly distinguishable. Shaw, Corban, and Gorely (2005) stated that the major differences between sport and exercise are the element of competition and degree of institutionalisation. Brukner, Khan, and Kron (2004) also pointed out that exercise does not necessarily involve competition and does not have rules and regulations governing the activity.

Apart from definitional differences, sport and exercise also diverge in the disciplines of psychology and physiology. The American Psychological Association (APA) (Portenga, Aoyagi, Balague, Cohen, & Harmison) clarified that, while sharing the kinetic component, sport and exercise differ in their goals, purpose and context of movement. Exercise psychology centres around positive health outcomes, thus is a subset of health psychology; whereas sports psychology focuses on performance excellence, therefore is a subset of performance psychology (Portenga et al.). In the physiology discipline, differences appear to be more hierarchical. While exercise physiology studies the changes in human body resulting from various exercises, sport physiology further applies these concepts to enhance athletic performance (Wilmore & Costill, 1999). These outlines suggest that sport and exercise are distinct concepts not only because of the definitions but also because they are studied differently in different disciplines.

As shown above, it is evident that sports and exercise are separate—although overlapping—concepts and delineating between them is likely to help investigators and practitioners better understand the nature of well-being across the different contexts. Hence, this study sets out to examine the various dimensions of SWB within these two different activities.
Well-Being in Exercise

Exercising has been shown to increase psychological well-being. Biddle et al. (2000) summarised four functions of exercise: to prevent the onset of mental illnesses, to serve as a treatment for mental illnesses, to improve the quality of life for the mentally ill, and improve psychological well-being in the general population; all of which relate to positive psychology in that prevention rather than cure is the focus (Mutrie & Faulkner, 2004). Indeed, the most prominent effect of exercise is the prevention of depression (Mutrie, 2002) although this effect received less support in the sporting context (McTeer & Curtis, 1993; Mutrie & Faulkner, 2004). Exercise can also increase self-esteem, improve perceived health and generate positive mood states, which are all predictors of subjective well-being (Biddle, 1995b; Kanning & Schlicht, 2010; Thøgersen-Ntoumani, Fox, & Ntoumanis, 2005). Mutrie and Faulkner (2004) concluded that exercise is beneficial to well-being through increasing both physical and mental health.

Despite the wealth of evidence purporting the positive effects of exercise on physical and mental health, the measures of well-being used have been poor, inappropriate or inconsistent, which has hindered the progress of exercise promotion (Biddle, 1996). Further research in the area pointed out that well-being should be considered and measured beyond short-term changes in emotions and include broader concepts such as how values may be expressed through exercise participation (Bloodworth & McNamee, 2007). The current research attempts to address this issue by providing a multidimensional measure of well-being in the context of exercise. Sport and well-being, on the other hand, has been studied through a slightly different approach.
Well-Being in Sport

Sport has a profound impact on both individual and societal levels of well-being and plays an important role in society. On the individual level, sport can enhance well-being through improved self-concept, better self-reflection and increased perceived health (Donaldson & Ronan, 2006; Hernández, 2011; Jonker, Elferink-Gemser, & Visscher, 2010). Sport also contributes to personal and social development (Faulkner & Taylor, 2005; Hernández, 2011; McKenna, 2010), which is considered a crucial part of well-being (McMahan & Renken, 2011). On the societal level, sport facilitates interpersonal interaction and may help communities reduce social exclusion and delinquency (Mutrie & Faulkner, 2004). Csikszentmihalyi (1990) proposed the flow theory and applied it to sport to describe the complete absorption and optimal experience obtained during participation, which ultimately serve as a component of subjective experiences of well-being. In fact, Bloodworth, McNamee, and Bailey (2012) emphasised that sport is so essential to well-being that it can be considered a human right, and many believe that the mechanisms of sport should expand beyond the sporting arena and into everyday lives to help non-elite individuals live to their full potential (Gould, 2002; Gustavo & Carbadillo, 2011). However, some evidence suggests that the effect of sport on happiness is only marginal (McTeer & Curtis, 1993; Molina-García, Castillo, & Pablos, 2007), and a conclusion has not been reached as to whether playing a sport is essential to well-being.

Nevertheless, opportunities exist for well-being to be conceptualised within the context of sport. Lundqvist (2011) emphasised that sport psychology should define well-being precisely for cross-study comparisons, and that well-being should be measured both globally (i.e. overall evaluation of life as a whole) and contextually (specific aspects of life, e.g. work, family). The current study will address these needs through capturing overall and
contextual well-being in physical activity using the different dimensions proposed by well-being theory.

Because the combination of global and contextual well-being is most representative of the construct of well-being (Diener et al., 1999; Wilson et al., 2007), a global or overall measure is needed for this study. The most extensively used overall measure for subjective well-being is the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) which is introduced in the following section.

**Satisfaction with Life**

Satisfaction with life stands for the global assessment of a person’s life according to his chosen criteria, and is a measure for subjective well-being. Diener (1984) identified two distinct yet related components of subjective well-being. The affective or emotional component is often measured with positive and negative affects; and the cognitive or judgemental component measured with life satisfaction (Diener, Emmons, Larsen, & Griffin, 1985). In sum, subjective well-being can be covered by using an emotional measure along with life satisfaction measures. The Satisfaction with Life Scale (SWLS) is a five-item measure used widely to assess the cognitive or evaluative component; its advantages include high validity, reliability and responsiveness, and a reasonably small number of items (Schiaffino, 2003). It has shown convergent validity from peer-rated and clinical data, making it suitable for a wide range of ages and special applications (Pavot, Diener, Colvin, & Sandvik, 1991). SWLS has been tested on Australian (Vella-Brodrick, Park, & Peterson, 2009), Taiwanese (Ku et al., 2011), Swedish (Hultell & Gustavsson, 2007), Spanish (Nunez, Martin-Albo, & Dominguez, 2010) and other samples worldwide, and the measure has been shown to not vary across cultures (Slocum-Gori, Zumbo, Michalos, & Diener, 2009). As suggested by Pavot and Diener (1993), because individuals
have unique sets of conscious and subconscious values and assign different weight to them, allowing the individual to make his/her own judgment of well-being creates a standardised score for subjective well-being and stand relatively similar across age, gender and culture (Arrindell, Heesink, & Feij, 1999; Hultell & Gustavsson, 2007; Wu, Chen, & Tsai, 2009).

Although the outcome focus for well-being theory is not exclusively subjective, due to the scope of the present study only subjective data can be gathered. Therefore, it is justifiable to use SWLS—a measure for subjective well-being—as the outcome variable and to gauge overall well-being. In addition, SWLS has already been tested in the context of physical activity (Nunez et al., 2010) and in sport (Pauperio, Corte-Real, Dias, & Fonseca, 2012) showing good psychometric properties. Additionally, data gathered in this study may be useful as a reference for future studies examining objective measures of well-being.

This study examines the contribution of well-being in physical activity to global well-being, or life satisfaction. The review of literature in psychology and physical activity presented above lead to the three Research Questions advanced in this study:

Research question 1: Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of sport contribute to life satisfaction?

Research question 2: Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of exercise contribute to life satisfaction?

Research question 3: Do the contributions of Positive emotions, Engagement, Relationships, Meaning and Accomplishment to life satisfaction differ between sport and exercise contexts?
Summary

The above literature review covered the key concepts of this research project. The rise, development and current directions of Positive Psychology are outlined. Therein, the multidimensional nature of well-being was presented, as were the global and contextual measurements of subjective well-being. Well-being theory was then introduced, and the elements of Positive emotions, Engagement, Relationships, Meaning and Accomplishment were defined. Following that, the application of well-being theory in the context of regular physical activity was made, and the differences between sport and exercise were detailed. Next, the Satisfaction with Life scale was established as the outcome variable measuring global well-being. Finally, the three research questions were stated.
Chapter 3: Method

The present study took a quantitative approach, utilising a cross-sectional, non-experimental design with a questionnaire distributed to participants on the Gold Coast. This method was chosen for its ability to generate a greater sample size within the limited timeframe of this study, thus allowing better generalisation to the target population—physically active adults on the Gold Coast—as well as observing the covariance of multiple variables in this study (Denzin, 1978). According to Creswell (2003), qualitative methods such as in-depth interviews and case studies are used on an emerging concept for exploration of possible variables and explanations; quantitative methods are used when at least one theory is in place to confirm the relationships between certain pre-determined variables. This research utilises well-being theory and aims at finding the contributions of five variables (PERMA) to one outcome variable (life satisfaction), therefore making a better fit for a quantitative approach. The study also employed both paper and online versions of the same questionnaire to obtain more responses, and literature supports this methodology, with a few recent papers asserting that results gained from online surveys do not significantly differ from results gained on-paper (Jäckle, Roberts, & Lynn, 2010).

Ethical Clearance

Ethical clearance for this research was obtained through Griffith University’s Office for Research prior to data collection. The researcher provided a detailed outline of the following topics for approval two weeks prior to commencement of data collection: project description, including purpose of the study, variables of interest, practical significance of the study and target participants; qualifications, specialisations and interests of the academic supervisor and student researcher; characteristics of target population, access and recruitment of participants, process and presentation of informed consent; duration and
format of data collection, procedure of obtaining permission from organisations to access participants; data analysis, storage, and uses of results.

The Office for Research then responded with a request to modify the application to which the researcher: provided reasoning and additional support for the exclusion of minors; ensured the procedure allowed permission to be obtained from organisations prior to accessing their members for data collection; attached email and telephone scripts used to contact organisations to obtain permission, as well as the script for directly approaching participants after permission was obtained from the organisation. The timeframe for data storage and access was specified, and the informed consent material was amended to include procedures involved in partaking in this study. Ethical clearance was then obtained from the Office for Research, two days before commencement of data collection.

Participants

Adults on the Gold Coast who exercise or play sport on a regular basis were targeted for this study. The Australian Government recommended 18 to 64 year olds to perform moderate to vigorous physical activity at least three times per week (Australian Government, 1999), therefore only people who meet these requirements were included in the analysis. People under the age of 18 were excluded from this study because adolescent do not have legal rights to take full responsibility on their behalf (Peter, 2012; Spear, 2000).

Participants were mainly recruited on a voluntary basis through face-to-face interaction with the researcher at approximately 15 locations on the Gold Coast, including Griffith University gymnasium, Griffith Dental clinic, various swimming pools, gymnasiums, sporting venues and fitness classes. For details on each location and the number of responses from each location, see Appendix I. Participants were approached only after the researcher contacted university sporting clubs, Gold Coast City Council
Active and Healthy program activities, and private fitness institutions. Participants from Griffith Rowing Club were directly contacted by their organisation via an email containing a link to the online version of the questionnaire. The sample closely resembled the population on the Gold Coast (Gold Coast City Council, 2012). There were 132 males and 183 females aged between 18 and 81 participating in this study. The mean age of the sample was 33 years, with 55% under the age of 30. Thirty percent were married, 46% were single, 8% were divorced and 16% indicated ‘others’. Eighty-nine percent of the sample holds at least a Bachelor degree or equivalent level of education; and 61% wrote ‘Australian’ as their nationality.

Questionnaire Design

The questionnaire was designed in three parts: (a) three items to screen frequency of physical activity and whether the activity was perceived as exercise or sport; (b) 15 items to gauge contextual well-being along the five dimensions (PERMA) and one item on general satisfaction about physical activity participation; and (c) the five-item Satisfaction with Life Scale. These parts are detailed below.

Frequency of physical activity and distinction between sport and exercise. The first item on the questionnaire asks for frequency of physical activity and serves as a filter to screen out sedentary respondents. To distinguish between exercise and sport, this study utilised a self-identification approach. Definitions of ‘exercise’ (i.e. Any structured and/or repetitive physical activity performed or practiced where the main intention is to achieve improved physical fitness) and ‘sport’ (i.e. An activity involving physical exertion, skill and/or hand/eye coordination as the primary focus, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations) were given, and respondents were asked to select the one that best describes their main
physical activity. The self-identification approach was selected because, according to the definitions of ABS (2008), some activity may be considered both an exercise and sport and the difference is best judged by the individual themselves rather than by a third party. This method has been used in previous studies for categorising groups with complex distinctions (Warber & Emmers-Sommer, 2012; Young, 2006).

**Well-being in physical activity scale.** The 16 items measuring contextual well-being were adapted from the PERMA-P Questionnaire by Butler and Kern (in preparation) (See Appendix II). Butler and Kern used a large pilot sample gathered through the Authentic Happiness website (http://www.authentichappiness.sas.upenn.edu) and with analysis, narrowed over 100 items down to 16 items measuring general well-being along the five dimensions of interest (Positive emotions, Engagement, Relationships, Meaning and Accomplishment). The PERMA-P Questionnaire was obtained after visiting the Authentic Happiness website—which only contained the pilot questionnaire—and finding the contact details of Dr. Margaret Kern. The researcher emailed Dr. Kern to seek permission to select some of their pilot questionnaire items for the current study. Dr. Kern subsequently replied with the 16-item measure along with permission to modify and use it in this study.

In adopting the PERMA-P Questionnaire for this study, the researcher brainstormed ideas to modify each item with a researcher in sport management. It was noted that many items contained a common stem (*In general, ...*) which can be easily modified to specify contextual well-being (*When participating in regular physical activity, ...*). For example, item P2 was changed from *In general, how often do you feel joyful?* to *While participating in your exercise/sport, how often do you feel joyful?* The same stem was then used to apply to items without the stem, such as item R1 *To what extent do you receive help and support*
from others when you need it? which was amended to *When participating in your exercise/sport, to what extent do you receive help and support from others when you need it?*

It was also observed that Butler and Kern used three types of anchors (*never-always, not at all-completely*, and *none of the time-all of the time*) and responses were recorded on 10-point Likert scales. The anchors and 10-point Likert scales were kept the same for each item to form the initial questionnaire. Next, the initial questionnaire was piloted to check if further modifications were needed.

**Pilot Questionnaire**

After initial design of the questionnaire, it was then piloted using the paper version with 30 participants including university lecturers, students, and members of a martial arts group. Verbal feedback was requested from 20 participants and taken into account to construct the final questionnaire. An issue repeatedly raised by the participants was that it was difficult to understand whether items measuring well-being were aimed at exercise or sport because many people participated in both types of activities. Improvements made to this issue were centred on emphasising the focus of items and avoided using *‘exercise’* and *‘sport’* in the same sentence, which resulted in:

1) Replacing *’Please read the following questions and answer by marking a circle on the scale below.’* with *’Please answer the following questions in relation to your main physical activity ONLY. Do not include other activities you may do.’*

2) Changing the beginning of questions *’While participating in your exercise/sport, …’* to *’While participating in your main physical activity, …’*

Another suggestion was changing the first item on the questionnaire (frequency of physical activity) such that it became a continuous scale rather than a dichotomy to increase richness of the data and possible follow-up comparisons. Therefore, the item was changed
from ‘Do you regularly participate in physical activities, 3 or more times per week? Yes/No’
to ‘On average, how often do you exercise or play sport? _____ times per week.’

A similar concept was proposed with determining the main physical activity. Many
people perform more than one type of physical activity on a regular basis, therefore it was
suggested asking respondents to list out each physical activity and their frequency before
selecting one as their main physical activity. While this suggestion was plausible, changes
were not made to this item because it would have lengthened the time to complete the
questionnaire and therefore potentially compromising the sample size of this study. The
third feedback given on the pilot questionnaire, however, helped to correct the
typographical error made with the Life Satisfaction scales (both ends appeared to be
Strongly Disagree).

For the other 10 participants completing the pilot questionnaire, feedback was not
requested and the participants were simply observed for signs of pausing, changing answers,
and skipping items. Even without prompting, some participants requested the researcher to
clarify item A2 (While participating in your exercise/sport, how much of the time are you
able to handle your responsibilities?). Five participants looked particularly confused when
responding to item E1 (While participating in your exercise/sport, to what extent do you
feel particularly excited or interested in things?), and one skipped the item altogether. The
third issue was that participants took eight minutes on average to respond to the whole
questionnaire. Three changes were made in response to the above observations:

1) Since ‘handling responsibilities’ usually requires the individual to perform a
task in completion of their role (e.g. in a job or as a mother), and often such a
task cannot be performed simultaneously with their regular physical activity,
item A2 was modified to reflect the frequency of exercise/sport participation
being helpful in handling responsibilities (How much of the time are you able to handle your responsibilities through participating in your main physical activity?).

2) It was unclear whether item E1 was referring to interest in things in general—which has a very large scope—or interest in the physical activity. This item was meant to measure degree of engagement, and since engagement requires the focus of attention to the present task at hand (Csikszentmihalyi, 1990), item E1 was adjusted to specify the physical activity as the activity of interest (While participating in your main physical activity, how much of the time do you become excited or interested in the activity you are doing?).

3) Grouping those items which employed the same anchors (i.e. not at all–completely) together to minimise confusion and reduce response time.

General well-being was gauged using Satisfaction with Life Scale (SWLS) (Diener, 1984). Past studies have shown the instrument to be reliable and consistent across age and gender. Because of this robust property, the SWLS was selected to measure the outcome variable of this study to suit the diversity in age and gender. For the final version of the questionnaire used in this study, see Appendix III.

Questionnaire Distribution

The questionnaire was distributed through making contact with sporting, exercise and fitness organisations on the Gold Coast. These organisations included: Griffith University’s sporting clubs, university gym, and Griffith Dental Clinic; the Gold Coast City Council’s Active and Healthy program activities; and private sporting/fitness centres. Permission was sought from each organisation before questionnaires were distributed. Two versions of the questionnaire were created, one on paper and one online through the
Qualtrics platform. The majority of the questionnaire was distributed via the paper version through speaking to members of the organisation or participants in the activity, directly before or after the activity was performed. However, two organisations (Griffith Rowing and the Brahma Kumaris Centre) preferred to email their members about the research rather than having the researcher on site. In both cases the researcher sent an email that contained a link to the online questionnaire to the organisation, and then the organisation forwarded the email to their members. The online version was not offered when making contact with organisations unless the activity was held at a time and place such that it was not possible for the researcher to travel to, or was specifically requested by the organisation.

Contact details for Griffith University sporting clubs were found online, and the researcher reached out to individual club presidents for permission to gather data on their members. For the badminton club, the president encouraged data to be collected during weekly training sessions; therefore the researcher visited the club at those times, twice in a three-week period, and handed out the questionnaires to members who were interested in participating. A similar situation occurred with the tennis club, except permission was obtained on the day. The researcher was physically present at the tennis courts and distributed questionnaires to members while they were waiting for their turn. Griffith University’s rugby union team president referred the researcher to their training facility on specific training days. The researcher was present at the site twice in a fortnight and distributed the questionnaire to players before training commenced. For the basketball team, the researcher was present at the site twice within the same week, once for collection of the men’s team and another for the women’s team. The questionnaire was distributed after training for the men’s team, and during first part of the training for the women’s team. The volleyball team coach was contacted and questionnaires were distributed by the researcher.
before the training session. The president of the rowing club indicated that the online version would be the preferred method of distributing the questionnaire, therefore the researcher emailed the questionnaire link to administration and then that email was forwarded to all rowing club members.

The Uni Gym was located on the Griffith University Gold Coast campus. The researcher sought verbal permission from the manager before commencing data collection. A table was set up near the entrance for one day, and the researcher approached members as they were entering or exiting the gym soliciting their interest in participating. A table was also set up at Griffith Dental Clinic, where patients freely participated in the study whilst waiting for their appointments. The researcher did not make a physical appearance at the Griffith Dental Clinic to monitor while the questionnaires were completed.

The Gold Coast City Council’s Active and Healthy Officer also agreed to take part in the study by notifying activity instructors about questionnaire distribution. The researcher attended Aqua fit, Deep water running, Stoller group, Pilates and Zumba classes over a two week period, and asked for participants of the classes to voluntarily fill out a questionnaire either before or after the class. Responses were collected immediately at the venue.

A general manager at The Sports Super Centre was contacted and agreed to help distribute the questionnaire. The Sport Super Centre is a sporting and exercise facility catering to elite athletes as well as to the general public for performance or active lifestyle needs. The centre holds regular fitness activities such as spin, yoga, deep water running for members and athletes. Questionnaires were distributed to participants in fitness classes, and they were also available at the reception area for members to complete. Some members
completed the questionnaire on the spot, while others filled them out in their spare time and returned them at their next visit.

**Data Analysis**

The data were handled in three stages. First, responses from the paper questionnaire were carefully entered into Statistical Package for the Social Sciences (SPSS version 20) while the online version was directly exported from the Qualtrics platform. All data were collated into an SPSS file and then screened for incomplete data, outliers and entry errors. Descriptive statistics including means and standard deviations were generated. Cronbach’s alpha was then computed for each PERMA element to check and adjust for scale reliability. Second, the data were split into two groups (sport or exercise) and a multiple regression analysis was performed for each group to address Research Questions 1 and 2. Regression analysis calculates the amount of variability in the dependent variable (i.e. satisfaction with life) that is linearly related to variability in the independent variables (i.e. the five PERMA elements). Multiple regression analysis was used because there is more than one independent variable in this study (Pedhazur & Kerlinger, 1982). Third, a comparison of the beta coefficients in each regression model was made to address Research Question 3 regarding the differences between the contributions of the PERMA dimensions to life satisfaction.
Chapter 4: Results

The results of data analysis are presented in the following order. First criteria to which individual cases were excluded, descriptive statistics, and corrections for reliability of scales are detailed. Second, the results of regression analysis for each group (sport and exercise) are shown, as well as the actions taken in response to violation of regression assumptions. Third, the comparison between the results of the regression analyses is made.

Data Clean-up and Group Characteristics

Approximately eight out of 10 people that the researcher approached completed the questionnaire. However, the response rate was unknown for data gathered in the Sport Super Centre and Griffith Dental Clinic because the researcher was not present at the venue. In addition, an email containing the link to the questionnaire was sent to 61 potential participants, out of which 45 responses were recorded. Combining the paper and online questionnaires, 338 responses were entered or imported into SPSS. Twenty-two cases were deleted from the dataset due to over half of the questionnaire being unanswered, or the respondent did not make a selection between sport and exercise. An additional two cases were removed because respondents were under the age of 18. In the remaining sample, 57 performed physical activity twice per week or less, and were therefore excluded from this study, giving a total of 257 (76%) usable data.

Two groups were formed on the basis of the respondents’ main physical activity. The exercise group (N=174) contained 57 males and 114 females, with 40% of those under 30 years of age. Thirty-nine percent were married, 10% were divorced, and 33% were single. For the sport group (N=83), the number of males and females were 58 and 25, respectively, and 81% were under 30 years of age. The percentage of participants that were married (15%) and divorced (5%) was less than that of the exercise group yet more
indicated they were single (68%). For both groups, similar proportion of participants having completed a Bachelor’s degree was evident (88% for exercise and 89% for sport).

**Descriptives Statistics and Reliability of Scales**

The means, standard deviations and Cronbach’s alpha were calculated for PERMA scales and SWLS. All but one scale presented sufficient reliability ($\alpha$ ranging from .730 to .811) (Bernardi, 1994). The Relationships scale, however, was not reliable ($\alpha = .452$). Further inspection of the data suggested that the removal of item R1 would result in an increase in Cronbach’s alpha (to .596), therefore this action was taken to correct for the insufficient reliability in the Relationships scale. The means, standard deviations, correlations and Cronbach’s alpha of each variable are presented Table 3.1.

**Table 3.1**

*Correlations, Means, Standard Deviations and Reliability Measures for Well-Being in Physical Activity and Life Satisfaction*

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<td>1.68</td>
<td>.807</td>
</tr>
<tr>
<td>3. REL*</td>
<td>.402*</td>
<td>.608*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>7.87</td>
<td>1.59</td>
<td>.596</td>
</tr>
<tr>
<td>4. MNG</td>
<td>.452*</td>
<td>.539*</td>
<td>.620*</td>
<td>1</td>
<td></td>
<td></td>
<td>8.37</td>
<td>1.28</td>
<td>.730</td>
</tr>
<tr>
<td>5. ACC</td>
<td>.490*</td>
<td>.746*</td>
<td>.504*</td>
<td>.627*</td>
<td>1</td>
<td></td>
<td>7.84</td>
<td>1.50</td>
<td>.809</td>
</tr>
<tr>
<td>6. SWLS</td>
<td>.231*</td>
<td>.272*</td>
<td>.402*</td>
<td>.452*</td>
<td>.319*</td>
<td>1</td>
<td>5.32</td>
<td>1.12</td>
<td>.881</td>
</tr>
</tbody>
</table>

* Correlation are significant at $p < .05$

a The Relationships Scale was corrected for a higher Cronbach’s Alpha

b POS, Positive emotions; ENG, Engagement; REL, Relationships; MNG, Meaning; ACC, Accomplishment; SWLS, Satisfaction with Life Scale.
Regression Analysis

Distribution of variable and assumptions of the analysis. Inspections of normality in the independent variables (PERMA) were first made with both visual techniques and statistical tests. Histogram and normality probability plots showed severe negative skews, and the Kolmogorov-Smirnov test indicated that the distribution of all variables deviate significantly from the normal distribution. According to Conlon (2004), non-normal variables need to be addressed in order for the results of the regression analysis to be valid, and variables with severe negative skews are best transformed with a reflected square root. Thus, data for contextual well-being (PERMA) were first reflected by subtracting variable means from 11 to inverse the skew, and then each new value was square rooted to correct for normality. In doing so, some of the variables became normal according to the Kolmogorov-Smirnov test, and the histogram and normal probability plots showed a greater resemblance to the normal distribution. For the results of visual and statistical tests of the normality of PERMA variables before and after the transformation, see Appendix IV. Due to the type of transformation performed in the analysis, negative beta coefficients represent a positive correlation with the dependent variable (SWLS).

Exercise participation. Results from the multiple regression analysis performed with the transformed variables revealed that Relationships ($\beta = .21$) and Meaning ($\beta = .28$) were the only significant contributors to Life Satisfaction. The model accounted for 18% of the total variance in Life Satisfaction, $F(5, 166) = 8.26, p < .05$. The results of the regression analysis for the exercise group are presented in Table 3.2.
Table 3.2

*Exercise Participation: Summary of Multiple Regression Analysis for Contextual Well-Being Predicting Life Satisfaction (N=174)*

<table>
<thead>
<tr>
<th>Construct</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotions</td>
<td>.061</td>
<td>.294</td>
<td>.021</td>
</tr>
<tr>
<td>Engagement</td>
<td>.351</td>
<td>.308</td>
<td>.129</td>
</tr>
<tr>
<td>Relationships</td>
<td>-.537</td>
<td>.271</td>
<td>-.206*</td>
</tr>
<tr>
<td>Meaning</td>
<td>-.911</td>
<td>.343</td>
<td>-.280*</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>-.399</td>
<td>.341</td>
<td>-.128</td>
</tr>
</tbody>
</table>

*a Constructs used in the regression have been transformed to meet normality assumptions
* p < .05.

Notes: $R^2 = .18$

*Sport participation.* A separate multiple regression analysis was run for the sport group. Results indicated that both Meaning ($β = -.37$) and Relationships ($β = -.27$) contributed significantly to Life Satisfaction. Together the linear model accounted for 28% of total variance in Life Satisfaction, $F(5, 77) = 7.28$, $p < .05$. The results of the regression analysis are presented in Table 3.3.

**Comparisons of Regression Models**

In addressing Research Question 3, a comparison of the model fit and beta coefficients were made between exercise and sport participants. The comparison showed that Relationships and Meaning contribute significantly to Life Satisfaction in both exercise and sport. However, both beta coefficients were higher in sport. In addition, the regression model was a better fit for sport participants, accounted for 10% more variance than it did in the exercise group. The relative beta coefficients for both groups are presented in Table 3.4.
Table 3.3

*Sport Participation: Summary of Multiple Regression Analysis for Contextual Well-Being Predicting Life Satisfaction (N=83)*

<table>
<thead>
<tr>
<th>Construct</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotions</td>
<td>-.127</td>
<td>.260</td>
<td>-.050</td>
</tr>
<tr>
<td>Engagement</td>
<td>.193</td>
<td>.361</td>
<td>.099</td>
</tr>
<tr>
<td>Relationships</td>
<td>-.603</td>
<td>.303</td>
<td>-.270*</td>
</tr>
<tr>
<td>Meaning</td>
<td>-.886</td>
<td>.316</td>
<td>-.369*</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>-.132</td>
<td>.355</td>
<td>-.063</td>
</tr>
</tbody>
</table>

*a Constructs used in the regression have been transformed to meet normality assumptions
*p < .05

Notes: $R^2 = .28$

Table 3.4

Comparison of Multiple Linear Regression Results for Exercise and Sport Participation

<table>
<thead>
<tr>
<th>Construct</th>
<th>Exercise participation Beta</th>
<th>Sport Participation Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotions</td>
<td>.021</td>
<td>-.050</td>
</tr>
<tr>
<td>Engagement</td>
<td>.129</td>
<td>.099</td>
</tr>
<tr>
<td>Relationships</td>
<td>-.206*</td>
<td>-.270*</td>
</tr>
<tr>
<td>Meaning</td>
<td>-.280*</td>
<td>-.369*</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>-.128</td>
<td>-.063</td>
</tr>
</tbody>
</table>

*a Constructs used in the regression have been transformed to meet normality assumptions
*p < .05
The above chapter detailed the statistical techniques used to address the three research questions in this study, and the results of the analyses were presented. In the next chapter, the theoretical and practical implication of these results along with limitations and future directions for the study are discussed.
Chapter 5: Discussion

The purpose of this study was to examine which dimensions of well-being—positive emotions, engagement, relationships, meaning and accomplishment—in the contexts of sport and exercise contribute to life satisfaction in participants of regular physical activity. This led to three main research questions. This chapter discusses the main findings, theoretical and practical implications, limitations of this study as well as suggestions for future directions.

Main Findings

The main findings of this study are as follows. First, select dimensions of well-being in physical activity contribute to life satisfaction across both sport and exercise contexts. For regular sport participants, relationships and meaning contribute to life satisfaction. For regular exercise participants, relationships and meaning also contribute to life satisfaction. Second, differences in the magnitude of contribution exist between two contexts. Specifically, well-being in sport has a greater contribution to life satisfaction than well-being in exercise. Third, positive emotions, engagement and accomplishment in physical activity did not contribute to life satisfaction. Finally, the dimensions of well-being in physical activity that contribute to life satisfaction differ slightly across marital status and age.

Dimensions of well-being in physical activity contributed to life satisfaction. The first research question examined which dimensions of well-being contribute to life satisfaction among regular participants of sport, and the results revealed that relationships and meaning in sport both contribute to life satisfaction. This study showed that people who play sport on a regular basis are more satisfied with their lives when they have good
personal relationships and feel loved in their sporting environment. Likewise, individuals are also more likely to be satisfied with life if their regular participation in sport is worthwhile and valuable, gives the individual a sense of direction and is part of leading a purposeful and meaningful life. This finding is consistent with past literature suggesting that social relationships play a crucial role in determining self-concepts and well-being (Jowett & Wylleman, 2006). Indeed, to play a sport, one must have an understanding of the opponents and/or team members to play a sport, which inevitably leads to verbal or nonverbal interpersonal interaction. The acceptance of the rules in sport makes the link among all players, followers and spectators regardless of their socioeconomic or cultural background. Thus sport is a powerful tool for expressing human values such as respect among others, teamwork and fairness (United Nations Sport for Development and Peace, 2013), all of which can lead to meaning and satisfaction with life.

Chatzisarantis and Hagger (2006) discussed that relationships and meaning constitute intrinsic life aspirations, which in turn leads to both hedonic enjoyment and eudaimonia. Interestingly, some research demonstrated that relationships and meaning in sport participation are often intertwined with each other. For example, Filo et al. (2009) summarised that the emotional meaning of attachment to charity sport events represents camaraderie, which encompasses the feeling of connection through sport and a sense of solidarity, friendship and belonging. In fact, relationships is the most common meaning in life among adults (Devogler & Ebersole, 1981), and having meaning in life contributes to life satisfaction (Ho et al., 2010; Scannell et al., 2002; Vella-Brodrick et al., 2009).

With regard to the second research question, this study showed that regular exercise participants are more likely to have greater life satisfaction if they also rated high on
relationships and meaning in exercise. Individuals who are satisfied with their personal relationships in the exercise environment, feel loved while exercising and have a sense of direction through exercise participation are also more satisfied with their lives than those who do not. This finding is consistent with previous research, which stated that having an exercise partner can increase the palatability of the exercise setting (Diehl, 2001).

The third research question investigates how the contributions of the five dimensions of well-being in physical activity to life satisfaction differ between sport and exercise participation. This study revealed that meaning and relationships in both sport and exercise contribute to life satisfaction, but the contributions are greater among sport participants. This means that the relationships and meaning in the context of sport is associated with a greater proportion of variance than the relationships and meaning in the context of exercise. Evidence in the literature suggest the effect sport has on bringing people together, through common interest, understanding of the game, respect of the rules and players, and appreciation of hard work in achieving excellence beyond the benefit of physical fitness (Filo et al., 2009; Mutrie & Faulkner, 2004; United Nations Sport for Development and Peace, 2013). On the contrary, literature in exercise provided minimal evidence on relationships and meaning beyond exercise adherence and achieving better health (Biddle, 1995a; Kanning & Schlicht, 2010; Mutrie, 2002).

**Dimensions of well-being that did not contribute to life satisfaction.** This study also found that positive emotions, engagement and accomplishment in regular physical activity did not contribute to life satisfaction. Possible reasons include the subjective nature of positive emotions, insufficient amount of time in engagement, and setting ego-oriented goals. Positive emotions during participation in physical activity may be associated with a
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variety of events and mechanisms (Gould, 2002; Hyde et al., 2011; Wankel, 2000). However, if positive emotions are associated with short-term events such as the reduction of stress and anxiety, relief from guilt and changes in the neurological system, it may also become short-lived and therefore having minimal contribution to life satisfaction (Berczik et al., 2012).

The engagement dimension of well-being—conceptualised as the amount of interest, level of absorption and the degree to which one loses track of time during their regular physical activity—also did not contribute to life satisfaction among participants in this study. This is contradictory to Csikszentmihalyi’s (1990) flow theory, which detailed that intense engagement leads to high levels of well-being. The reasons for engagement not contributing to life satisfaction could be that perhaps only engagement above a certain level, intensity, amount, duration or proportion of time will contribute to life satisfaction. Another speculation is that the type of engagement may also affect the contribution to life satisfaction. Fredricks et al. (2004) detailed three types of engagement commonly used in educational settings: behavioural, emotional and cognitive. Behavioural engagement draws on the idea of participation and involvement in activities; emotional engagement refers to the positive and negative affects toward the individuals and organisation; cognitive engagement entails willingness to exert the effort to comprehend complex ideas and master difficult tasks.

The last dimension of well-being in physical activity that did not contribute toward life satisfaction was accomplishment. According to achievement goal theory and self-determination theory, in order to increase well-being, individuals must set goals that satisfy at least three innate human needs: the need for competence, autonomy and relatedness
(Elliot & Thrash, 2001; Frederick & Ryan, 1995; Kaplan & Maehr, 1999). The reason that accomplishment, as a dimension of well-being, did not contribute significantly to life satisfaction in this study may have been due to: participants not having set goals that satisfy one or all of these needs; a lack of self-endorsed values in the goal; compared to others’ standards instead of their own; or the goals achieved was not attributed to their effort.

**Theoretical Implications**

This study demonstrated that positive psychology is applicable to the context of physical activity. Well-being in physical activity explained a proportion of variance in life satisfaction, thus indicating that research in this context is crucial to understanding differences in subjective well-being.

The second theoretical implication of this study was the provision of conceptual definitions of the various dimensions of well-being in the context of physical activity. Previous research has called for a unified direction in measuring well-being in the context of physical activity, which would encompass both hedonic and eudaimonic concepts (Bloodworth & McNamee, 2007; Lundqvist, 2011). This research has defined five dimensions of well-being in the context of physical activity, which are presented in Table 5.1.

The third theoretical implication of this study centred on the differences associated with the type of physical activity performed, namely sport and exercise. Sport and exercise operate differently in contributing to life satisfaction, suggesting that studies of well-being in the context of physical activity should take care to distinguish these activities.
Table 5.1

Definitions of Five Dimensions of Well-Being in the Context of Physical Activity

<table>
<thead>
<tr>
<th>Dimension of well-being</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive emotions</td>
<td>The joy, content and positive feelings experienced during participation in regular physical activity.</td>
</tr>
<tr>
<td>Engagement</td>
<td>The amount of interest, level of absorption and the degree in which one loses track of time during their regular physical activity.</td>
</tr>
<tr>
<td>Relationships</td>
<td>The support, caring, feelings of love, and the quality of personal relationships amongst people in the individual’s usual physical activity environment.</td>
</tr>
<tr>
<td>Meaning</td>
<td>The sense of purpose and direction in life derived through participation in the individual’s chosen regular physical activity, and the extent of feeling that participation is valuable and worthwhile.</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>The feelings of progress and achievement of important goals in sport or exercise, and the ability to handle personal responsibilities through regular participation in physical activity.</td>
</tr>
</tbody>
</table>

Practical Implications

The practical implications of this study suggest that governments, practitioners and decision-making bodies can highlight the relationships and meaning component of physical activity to contribute to life satisfaction among people who regularly participate in exercise or sport. Strategies for sport practitioners, exercise practitioners, and governments to leverage relationships and meaning are presented separately in this section. Finally, different ways to construct positive emotions, engagement and accomplishment through physical activity are suggested.

Implications for sports practitioners. Relationships among sport participants can be highlighted through having a half-day gathering every month for all players and families. Faulkner and Taylor (2005) suggest that sport can facilitate social integration through
forming relationships in the community; therefore, the date of gathering is best selected on a day when a match or tournament is played live on television, and food can be brought by each family to share among others. During the gathering, some players can watch the game while a variation of the sport is played to suit younger children and seniors. The sports practitioners should encourage players and families to share their interest and use their strengths to help each other. Another way relationships—specifically camaraderie—can be enhanced in sport is to organise a friendship match involving players from another club or division. Two new teams will be formed based on a random selection of players from both clubs, and the match will be played between these new teams. The players are encouraged to communicate among each other and come up with strategies for a better game utilising each other’s strengths.

Meaning in sport in this study is measured as the sense of purpose and direction in life through sport participation. Previous research has focussed on the meaning of sport (Battista, 1990; Bulley et al., 2009), however, this study showed that it is the meaning through regular participation in physical activity that can contribute to life satisfaction. To leverage meaning through sport, practitioners need to first understand what gives meaning to life for each individual. This can be done by having a 15 to 20 minute one-on-one appointment with each participant to discuss the answers of these questions: ‘What is your purpose or meaning in life?’ ‘What activities do you consider meaningful or valuable?’ ‘How can participation in sport help you live by your values or achieve your purpose in life?’ Sport practitioners then utilise these answers to design programs that align with the individual’s objectives. For example, if a participant answered ‘Being there for my friends and family in need’ as their purpose in life, practitioners can make the program flexible so that if occasion arises the individuals are able to spend time assisting their friends or
relatives. Similarly, if ‘Inspiring others through my personal achievements’ is what the individual lives by, then the program can be geared towards improvements against personal records.

**Implications for exercise practitioners.** Relationships among exercise participants can be leveraged by providing opportunities for interpersonal interactions. Diehl (2001) concluded that having close relationships in the exercise setting can increase motivation and adherence and decrease anxiety, therefore this study suggest that exercise facility managers can arrange a discount from nearby cafés or food outlets if two or more members of the facility make a purchase together. Gymnasiums can promote a ‘buddy workout’ using points or prizes as incentives to encourage members to partner during their training. Prizes can be awarded to the members who did the most workouts with the most number of different members within a three-month period. Practitioners can also utilise exercises that require the help, communication and understanding of each other to perform, such as assisted stretches, synchronised movements and team games. Exercise class instructors can welcome new participants by making an announcement to introduce them before the class and encourage existing participants to help them.

To enhance meaning through exercise participation, suggestions are similar to that made to sport instructors. A one-on-one session can be held for each participant to discuss what their meaning in life is and how exercise participation can maximise that meaning. Alternatively, exercise practitioners can host a group discussion where members take turns telling each other what is valuable to them and how exercise facilitated or may facilitate that value.
Implications for governments and decision-making bodies. The promotion of regular physical activity can be done using advertising material to target the positive relationships in physical activity as well as meaning through participation. Interviews can be done with regular exercise and sport participants, and excerpts such as ‘The relationships among my teammates really helped me through stressful times at work’ or ‘Exercise was the main reason I can play with my grandson at age 85 and experience the joy and meaning of life’ can be printed on pamphlets or announced on radio or television so the general public can relate to those experiences.

Ways to construct positive emotions, engagement and accomplishment. Positive emotions, engagement and accomplishment in physical activity did not contribute to life satisfaction among participants in this study, suggesting that these dimensions of well-being can be modified or enhanced in sport and exercise. Evidence in the literature, as well as the high correlations found in this study indicated that positive emotions, engagement and accomplishment are closely related, therefore a combined strategy—derived from achievement goal theory and elements of flow (Csikszentmihalyi, 1990)—is proposed. In the first step, practitioners can assist participants to set self-improvement goals that orient towards gaining competence and growth (for example, ‘be fitter to improve my game’ or ‘lose weight prove to overcome my own challenges’) by consulting individuals to understand their motives, then collaborate to set specific and tangible goals in the plan (for example, ‘having 80% accuracy on serves by the end of June’ or ‘able to run for 25 minutes non-stop in three weeks’ time’). The next step is to design programs that match the ability of the participant by first testing to see where his or her ability is at. During training, practitioners should provide immediate feedback on each performance, and help the participant to learn to self-feedback (for example, watch a video of himself or herself
performing certain actions and associate that action with kinaesthetic feedback, or teach them to use the heart rate monitor on the treadmill). According to Csikszentmihalyi (1997), to enter the flow and enjoy the activity fully requires full immersion of attention and gaining control of mind and body. Therefore, distractions should be discouraged (such as watching a television or studying while on the bicycle) until one can fluently control his or her body in each movement.

**Limitations**

The limitations of this study should be acknowledged. First, due to the restricted timeframe of this study, the scales used to gauge well-being in physical activity were modified from an unpublished source (Butler & Kern, in preparation) instead of deriving through traditional scale development procedures. Second, there was almost double the number of participants in exercise than participants in sport, making a large difference in sample size between the two groups. Even though statistical corrections were made to adjust for this difference, it would still be beneficial to have an equal number of participants so that a fair comparison can be made. Third, the time which participants completed the questionnaire was not controlled for. Some participants completed the questionnaire before their physical activity session, some after, some during their break, and some completed in their own time and returned it at the next session. The participant environment and short-term effects of exercise on mood may have altered the results. Due to the requests by physical activity coordinators and the amount of data needed for the timeframe of this study, it was not possible to ask for a unified timing for data collection.
Future Directions

In response to the first limitation, better scales can be developed to specifically measure well-being in the context of physical activity. Churchill (1979) detailed eight steps for development of valid and reliable measures for behavioural data, starting from specifying the domain of construct, generating sample of items, purifying the measures to assessing scale reliability, validity and developing norms. Future scale development can begin with conducting focus groups of regular physical activity participants and practitioners to generate at least eight items per well-being dimension, and then use pilot data to perform factor analysis and formula for the reliability of linear combinations (Churchill, 1979). The measure can then be used to measure PERMA in physical activity, corresponding to the ‘dashboard’ approach proposed by Seligman (2011) and Forgeard et al. (2011). A combination of subjective and objective measures, such as physical health and scales rated by others, can also be made to provide additional evidence on well-being in physical activity in order to better capture the construct (Forgeard et al., 2011).

The second recommendation for future direction is in regards to changes in well-being. It is worth investigating whether the location and timing of questionnaire completion alter the responses. Longitudinal studies can also be designed to see if there are changes in the dimension of well-being in physical activity that contribute to life satisfaction, as well as possibly causes and correlates for the change. Other factors that may determine the dimension of well-being that contribute to life satisfaction include individual characteristics (culture, personality, interests), the characteristics of physical activity (organised and organised sport, group and individual exercises), the level of involvement in the activity
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(recreational, competitive, years of involvement), and the interaction among these factors, which are all potential directions for future research.

Conclusions

This study examined the contribution of various dimensions of well-being in the context of sport and exercise participation to life satisfaction among regular physical activity participants. Well-being theory was used to apply the five dimensions of well-being, which are Positive emotions, Engagement, Relationships, Meaning and Accomplishment (PERMA). The three research questions that guided the study were

1) *Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of sport contribute to life satisfaction?*

2) *Do Positive emotions, Engagement, Relationships, Meaning and Accomplishment in the context of exercise contribute to life satisfaction?*

3) *Do the contributions of Positive emotions, Engagement, Relationships, Meaning and Accomplishment to life satisfaction differ between sport and exercise contexts?*

A review of the literature formed the background for defining each PERMA dimension, as well as the delineation of sport and exercise as two distinct activities. Data were collected by modifying a questionnaire and distributing it to regular physical activity participants at 13 locations on the Gold Coast, including various sporting clubs, exercise groups and fitness facilities. Multiple regression analysis was used to interpret the data. Results demonstrated that relationships and meaning in physical activity contribute significantly to life satisfaction among regular sport and exercise participants. In particular, the contributions of relationships and meaning were greater in the context of sport than in
the context of exercise. These results suggest that practitioners and governments can
design specific strategies such as family day, buddy programs, consultations and
testimonials to leverage the relationships and meaning in physical activity to promote well-
being, thus taking a proactive approach in reducing the burden of disease among
individuals and in society. This study also extends positive psychology to the context of
physical activity, suggesting that research in this context is crucial to understanding
differences in well-being, and providing a basis for measuring well-being in physical
activity. Future research can derive a reliable measure through vigorous scale development
procedures using PERMA as conceptualised in this study, and work towards providing a
dashboard approach to address the concept of well-being. It is also essential that individual
characteristics, longitudinal changes and other factors be investigated in order to validate
and further extend the results of this study.
References


Appendix I.

Data Collection Locations and Organisations

<table>
<thead>
<tr>
<th>Location</th>
<th>Group name</th>
<th>Number of responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queensland Academy for Health Sciences</td>
<td>Badminton club</td>
<td>12</td>
</tr>
<tr>
<td>Griffith University</td>
<td>Tennis club</td>
<td>14</td>
</tr>
<tr>
<td>Griffith University</td>
<td>Uni Gym</td>
<td>26</td>
</tr>
<tr>
<td>Benowa Rugby Fields</td>
<td>Griffith Uni Rugby Union Club</td>
<td>30</td>
</tr>
<tr>
<td>The Southport School</td>
<td>Greendoggs Basketball (men)</td>
<td>10</td>
</tr>
<tr>
<td>The Southport School</td>
<td>Foxxes Basketball (women)</td>
<td>12</td>
</tr>
<tr>
<td>Southport Yatch pool</td>
<td>Aqua fit (Active and Healthy GC)</td>
<td>53</td>
</tr>
<tr>
<td>Helensvale State School</td>
<td>Zumba (Active and Healthy GC)</td>
<td>17</td>
</tr>
<tr>
<td>Parklands Indoor Sports Centre</td>
<td>Beach volleyball</td>
<td>5</td>
</tr>
<tr>
<td>Helensvale</td>
<td>Tai chi (Active and Healthy GC)</td>
<td>9</td>
</tr>
<tr>
<td>Southport</td>
<td>Griffith Dental Clinic</td>
<td>33</td>
</tr>
<tr>
<td>Parklands Indoor Sports Centre</td>
<td>Indoor volleyball</td>
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</tr>
<tr>
<td>Burleigh Heads</td>
<td>The Original Stroller Group (Active and Healthy GC)</td>
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</tr>
<tr>
<td>Runaway By</td>
<td>Sports Super Centre</td>
<td>37</td>
</tr>
<tr>
<td>Online</td>
<td>Griffith Rowing &amp; Brahma Kumaris Centre</td>
<td>46</td>
</tr>
</tbody>
</table>
Appendix II.

The PERMA-P Questionnaire: A Brief Measure of Flourishing

Julie Butler and Margaret L. Kern

University of Pennsylvania

Each question is on a 0 to 10 scale, with anchors noted in parentheses below. Items should be randomly presented (or mix the order across the constructs). The measure consists of 15 items plus a general well-being. Three items assess each of the PERMA (positive emotion, engagement, relationship, meaning, and accomplishment; Seligman, 2011) constructs. Composite scores are averaged across the three items (range 0-10, higher scores = greater well-being). The general well-being question is comparable with other large-scale surveys, and is included as an overall evaluation of well-being.

1. In general, how often do you feel joyful? (never-always; P)
2. In general, to what extent do you feel positive? (never-always; P)
3. In general, to what extent do you feel contented? (never-always; P)
4. How much of the time do you become absorbed in what you are doing? (none of the time-all of the time; E)
5. In general, to what extent do you feel particularly excited or interested in things? (not at all-extremely; E)
6. How much of the time do you lose track of time while doing something you enjoy? (none of the time-all of the time; E)
7. To what extent do you receive help and support from others when you need it? (never-always; R)
8. To what extent have you been feeling loved? (not at all-completely; R)
9. How satisfied are you with your personal relationships? (not at all-completely; R)
10. In general, to what extent do you lead a purposeful and meaningful life? (not at all, completely; M)
11. In general, to what extent do you feel what you do in your life is valuable and worthwhile? (not at all-completely; M)
12. To what extent do you generally feel you have a sense of direction in your life? (not at all-completely; M)
13. How much of the time do you feel you are making progress towards accomplishing your goals? (none of the time-all of the time; A)
14. How much of the time do you achieve the important goals you have set for yourself? (none of the time-all of the time; A)
15. How much of the time are you able to handle your responsibilities? (none of the time-all of the time; A)
16. Taking all things together, how happy would you say you are? (Not at all-completely; Overall well-being)
Appendix III

WELL-BEING IN PHYSICAL ACTIVITY QUESTIONNAIRE

A) On average, how often do you exercise or play sport? ____________ times per week.

B) What is your main physical activity (e.g. tennis, jogging, gym)?

C) My main physical activity is exercise* / sport* (please circle)

*Answer the above question using the definition below

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Sport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any structured and/or repetitive physical activity performed or practiced where the main intention is to achieve improved physical fitness.</td>
<td>An activity involving physical exertion, skill and/or hand/eye coordination as the primary focus, with elements of competition where rules and patterns of behaviour governing the activity exist formally through organisations.</td>
</tr>
</tbody>
</table>

Now, please answer the following questions in relation to your main physical activity ONLY. Do not include other activities that you may do.

1. While participating in your main physical activity, to what extent do you feel positive? (Item P1)

   Never
   O O O O O O O O O O O

   Always

2. While participating in your main physical activity, how often do you feel joyful? (Item P2)

   Never
   O O O O O O O O O O O

   Always

3. To what extent do you receive help and support from others in your main physical activity environment when you need it? (Item R1)

   Never
   O O O O O O O O O O O

   Always

4. While participating in your main physical activity, to what extent do you feel contented? (Item P3)

   Never
   O O O O O O O O O O O

   Always
5. While participating in your main physical activity, how much of the time do you become excited or interested in the activity you are doing? (Item E1)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

6. While participating in your main physical activity, how much of the time do you lose track of time because you enjoyed it? (Item E2)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

7. While participating in your main physical activity, how much of the time do you feel you are making progress towards accomplishing your goals? (Item A1)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

8. How much of the time are you able to handle your responsibilities through participating in your main physical activity? (Item A2)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

9. While participating in your main physical activity, how much of the time do you become absorbed in what you are doing? (Item E3)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

10. How much of the time do you achieve the important goals you have set for yourself in main physical activity? (Item A3)

<table>
<thead>
<tr>
<th>None of the time</th>
<th>All of the time</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

11. To what extent do you feel participating in your main physical activity is valuable and worthwhile? (Item M1)

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

12. How satisfied are you with your personal relationships in your main physical activity environment? (Item R2)

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>O O O O O O O O O O O</td>
<td>O O O O O O O O O</td>
</tr>
</tbody>
</table>

IT’S ABOUT HALF DONE! TURN THE PAGE…
13. To what extent do you generally feel you have a sense of direction in your life while participating in your main physical activity? (Item M2)

Not at all          Completely
O           O           O           O           O           O           O           O           O           O

14. To what extent have you been feeling loved while participating in your main physical activity? (Item R3)

Not at all          Completely
O           O           O           O           O           O           O           O           O           O

15. While participating in main physical activity, to what extent do you lead a purposeful and meaningful life? (Item M3)

Not at all          Completely
O           O           O           O           O           O           O           O           O           O

16. Taking all things together, how happy would you say you are in general, while participating in your main physical activity? (Item O)

Not at all          Completely
O           O           O           O           O           O           O           O           O           O

Thank you for your patience. Just a few more to go!

Below are five statements in which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each statement by marking the appropriate circle.

1. In most ways my life is close to my ideal.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither agree or disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

2. The conditions of my life are excellent.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither agree or disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

3. I am satisfied with my life.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither agree or disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
4. So far I’ve gotten the important things I want in life.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither agree or disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

5. If I could live my life over, I would change almost nothing.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Slightly disagree</th>
<th>Neither agree or disagree</th>
<th>Slightly agree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

Just a little about you…

Gender: Male / Female
Age ______
Nationality ________________
Marital status: Married / Divorced / Single / Others (_______)
Education level: High school / TAFE / Bachelors degree / Masters degree / PhD

Thank-you very much for taking part in this project! If you would like to receive information regarding group results, please leave your email address with the researcher. Otherwise, just hand this straight back and knowing your responses are truly valuable!
Appendix IV.

Test of Normality of Variables Before and After Data Transformation

Before

Positive emotions

Detrended Normal Q-Q Plot of Mean Positive Emotions

Observed Value

After

Detrended Normal Q-Q Plot of sqrt(ref_posEmo)

Observed Value

Engagement

Detrended Normal Q-Q Plot of Mean Engagement

Observed Value

Detrended Normal Q-Q Plot of sqrt(ref_Engage)

Observed Value

Relationships

Detrended Normal Q-Q Plot of Mean Relationships

Observed Value

Detrended Normal Q-Q Plot of sqrt(ref_Relationships)

Observed Value
DIMENSIONS OF WELL-BEING IN PHYSICAL ACTIVITY

<table>
<thead>
<tr>
<th>Construct</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K-S statistic&lt;sup&gt;a&lt;/sup&gt;</td>
<td>S-W statistic&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Positive emotions</td>
<td>.113*</td>
<td>.923*</td>
</tr>
<tr>
<td>Engagement</td>
<td>.119*</td>
<td>.902*</td>
</tr>
<tr>
<td>Relationships</td>
<td>.113*</td>
<td>.937*</td>
</tr>
<tr>
<td>Meaning</td>
<td>.113*</td>
<td>.920*</td>
</tr>
<tr>
<td>Accomplishment</td>
<td>.097*</td>
<td>.938*</td>
</tr>
</tbody>
</table>

<sup>a</sup>Kolmogorov-Smirnov’s D statistic

<sup>b</sup>Shapiro-Wilk’s W statistic

* Significant at the .01 level