THE EFFECT OF NEED-SUPPORTIVE LEADERSHIP ON THE PSYCHOLOGICAL WELL-BEING, MOTIVATION AND PERFORMANCE OF ADOLESCENT SPORT ACHIEVERS IN SOUTH AFRICA

by

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Declaration

I, Melissa Tristan Barnaschone, declare that this thesis hereby submitted for the degree of Philosophiae Doctor in Psychology, at the University of the Free State, is my own independent work. It has not previously been submitted for any other degree at another university/faculty. I, furthermore, cede copyright of this thesis in favour of the University of the Free State.

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“Sport has the power to change the world. It has the power to inspire. It has the power to unite people in a way that little else can. Sport can awaken hope where there was previously only despair.”

Nelson Mandela, 2000

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Glossary of Acronyms and Abbreviations

AVE	Average Variance Extracted
BPNT	Basic Psychological Needs Theory
CBAS	Coaching Behaviour Assessment System
CET	Cognitive Evaluation Theory
CFA	Confirmatory Factor Analysis
COT	Causality Orientation Theory
CRPBI	Children's Report of Parental Behaviour Inventory
GCT	Goal Contents Theory
LSS	Leadership Scale for Sports
OIT	Organismic Integration Theory
PANAS	Positive Affect and Negative Affect Schedule
PLS	Partial Least Squares
POPS	Perceptions of Parents Scale
SDT	Self-Determination Theory
SEM	Structural Equation Modelling
SMS	Sport Motivation Scale
SPSS	Statistical Package for the Social Sciences
SRSA	Sport and Recreation South Africa

CHAPTER ONE

Introduction

Background

The Development of a Winning Sporting Nation: A South African Perspective

In the year 2007, South Africa's Sport and Recreation Department (SRSA) stated that:

> For a country to succeed at sport it is essential that it has quality factual evidence to guide the development of its sport talent. Research projects contain the potential to make the difference between winners and losers on a field and contribute tangibly to the well-being of a sporting South Africa… if the results are applied well enough. (www.srsa.gov.za)

Five years later, and more precise in their strategy for improving and strengthening the performances of athletes and coaches at all levels of participation within South Africa, the following was stated:

> Elite athletes and coaches have a range of specialised needs that have to be met if they are to perform optimally in the world arena. It is pertinent to address these to support performance and to encourage retention within South Africa. Sports development and excellence in high performance sport require an evidence-based, holistic and coordinated sports science support system. (Sport and Recreation South Africa, 2012b, p. 30)

Despite the fact that South Africa has produced a large number of world-class athletes, it is both necessary and essential to constantly strive to advance the performance levels and consistency of both our existing and prospective athletes, in order to sustain and continue achieving success at the elite level (Lovell, 2005).

In the time from its re-admission into the international sporting arena, there has been a strong increase in the social and cultural importance of sport in South Africa. Since the end of Apartheid in 1994, sport has often been identified as a basic ingredient in the national cohesion of South Africa, whilst also signifying measurable economic value and serving as a

vehicle for the fundamental progressive human advancement of all its people (Sport and Recreation South Africa, 2012a). In spite of this, SRSA (2012a) has identified selected key issues and challenges which our country is facing. In the first instance, there appears to be insufficient leadership and an absence of trained, skilled human resources, such as professional coaches, within most rural areas in South Africa. Secondly, although school sport continues to be a critical constituent for sports development, the absence and inadequacy of sporting facilities in the majority of rural schools and communities poses an unlevel playing field as far as opportunities are concerned. Thirdly, a well functioning system is required to ensure that the development of athletes from talent detection through to elite levels is seamless and efficient. Finally, the national sports teams are required to be representative of the total South African population, therefore the inclusivity of women, diverse cultures, the youth, the elderly and persons with disabilities should be promoted.

Gender and Cultural Diversity

Sport occurs in a culturally diverse world with heterogeneous participants, yet: (a) the sport population does not epitomise the broader populace and; (b) sport psychology rarely addresses the issues of gender or cultural diversity and the current research base is dominated by Western perspectives, despite the professional practice of elite sport reflecting cultural boundaries (Gill, 2007). South Africa, as a country, is composed of a mosaic of ethnicities and races and, in the 1990s, multiculturalism permeated the South African public discourse when Archbishop Desmond Tutu conceived of the new South Africa as being the rainbow nation – celebrating unity in diversity. In South Africa, ethnicity / racial and cultural diversity are unwittingly presented with a unifying role, being melted together by a political dispensation (Mhlanga, 2011).

In the South African sporting arena, although broadly defined, culture is frequently interchangeably used with race /ethnicity. In the current study, the term *race* was utilised to reflect the socio-politically nuanced South African sporting context.

In recent years, whilst still limited, sport psychology literature focusing on gender differences has emerged (Gill, 2007). However, according to Ram, Starek and Johnson (2004), sport-psychology research seldomly includes racially diverse participants, exemplifying a striking void in the literature despite an increase in the multicultural diversity in sport and society in its entirety. This marked gap in research is especially apparent within the South African sporting context.

As stated by Parham (2005), sport is a unique environment, with sport psychology being unequivocally context-dependent and, as 'context is everything' for the effective practising of sport psychology, people need to be considered in context in order to fully understand their behaviour. By expanding the research on gender and cultural diversity, not only can sport psychology aid in challenging people's worldview along with advancing and enriching the scholarship, profession and public interest, but it can also promote sport for all and ensure that the expertise and benefits of the discipline are not limited to the elite sport participants (Gill, 2007).

Purpose and Necessity of the Study

Internationally, sport has become a profession and, as can be detected from the above, the desire for success has resulted in sporting professionals constantly searching for means and resources to enhance performance levels. It has repeatedly been established that success on the sporting field is not only due to physical training, but also includes psychological and emotional factors (Lovell, 2005).

The strategic objectives envisaged by the SRSA sports system, in creating an environment conducive to enhancing the performance and promoting the development of the

South African athletes, are based on the core values of *athlete-centredness* (devoting support, in a holistic manner, to the individual's growth, development and long-term well-being) and *coach driven* (a system guided by well-trained and skilled coaches). These strategic objectives include the following: (1) Improving the performances of athletes and coaches through the provision of comprehensive support programmes; (2) The provision of support and empowerment to South African coaches; (3) Establishing a coordinated academy system for the development of South African sport and; (4) By means of transformation initiatives, ensuring equal participation opportunities for all South Africans, with the possibility of excelling (Sport and Recreation South Africa, 2012b).

A vital cog, often identified by research, in the wheel of the development and performance of the athletes, pertains to the coaching/leadership styles employed by coaching staff (Sport and Recreation South Africa, 2007).

> Coaching and the development of sporting skills are key elements in any successful sports system. In the highly competitive and demanding world of international sport, South Africa needs to explore all possible means to ensure that our coaches are kept abreast with latest technology, research, techniques and developments and provide our athletes with a competitive edge. (Sport and Recreation South Africa, 2012b, p. 40)

The South African context offers a unique challenge in this regard as teams are expected to reflect the rich cultural diversity innate in our community.

Research conducted by Goris (2006) with Belgian youth, indicated that need-supportive leaders/coaches produce athletes with superior psychological well-being, greater progress and heightened performance. Need-supportive leadership entails a leader satisfying the three fundamental psychological needs for autonomy, competence and relatedness (these needs are to be defined and discussed in greater length in Chapter Three). The purpose of this

study will be to explore the relationship between perceived need-supportive leadership and the participation motivation, psychological well-being and performance levels of South African top achieving sporting youth. The focus of this study falls in line with the needs, aims and objectives of the SRSA (2007; 2012a; 2012b) and, should the perceived leadership style be identified as a measurable initiator of performance, many youth could benefit from a focus on the appropriate leadership development of the coach. Furthermore, in view of Gill's (2007) and Ram, et al.'s (2004) emphasis that a strong void exists in gender and cultural/racial sport-related research, the present study aims to not only contribute to filling this hiatus in the South African sport-environment research, but also to advancing the worldview and development of multicultural competencies for sport psychology practice.

General Research Aims

The following three broad research aims will be investigated:

1. Exploring the relationships between perceived need-supportive leadership and athletes' motivation, psychological well-being and performance.
2. Investigating whether the theoretical model can provide statistically significant evidence that the athletes' perceived need-supportive leadership of the coach leads to enhanced motivation, a positive psychological well-being and heightened performance.
3. Investigating any meaningful differences with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and performance variables across gender and race, in order to advance our understanding of gender and racial profiles within the sporting environment. Ultimately, it is envisioned that the present study will, firstly, enlighten the leaders within South African sport to be able to successfully meet the needs of this culturally diverse population; secondly, initiate the filling of the existing void of sporting research within the South African context; and

thirdly, inform a possible platform from which future intervention programmes can be launched.

Dissertation Structure

An outline of the dissertation structure is provided in Table 1.

Table 1

Outline of Dissertation

Chapter	Topic	Nature
One	Introduction	Theoretical
Two	Leadership and Motivation in Sport	Theoretical
Three	Self-Determination Theory	Theoretical
Four	Methodology	Empirical
Five	Results	Empirical
Six	Discussion	Empirical

To begin with, Chapters Two and Three of the dissertation are comprised of the literature survey. Chapter Two explores various approaches to leadership and motivational theories in sport. In Chapter Three the conceptual theory used as the theoretical framework for this study, namely self-determination theory, is discussed. Chapter Four marks the establishment of the empirical component of the study, outlining the methodology employed, proceeded by the results and discussion in Chapters Five and Six respectively.

CHAPTER TWO

Leadership and Motivation in Sport

The growth and development of sport psychology dates back to the mid-20th century, where perspectives and research within the field were inclined to be analogous to those in general psychology, as theories were loaned from psychology and applied to sport settings. As a result of this historical precedent, besides researchers acquiring varied results due to theoretical and methodological inadequacies, three core quandaries arose: (a) there were few programmes of sustained research; (b) a broadly accepted conceptual paradigm was lacking; and (c) there was a delayed advancement of knowledge within sport psychology (Kontos & Feltz, 2008). Since the 1980s, however, the sport psychology research areas have become sport specific and measurement driven and tremendous progress and development within sport and exercise psychology has occurred internationally. This, in turn, has resulted in the field of sport psychology obtaining a wider acceptance from not only psychology, but also the public in general (Kontos & Feltz, 2008). Today, sport and exercise psychology is a dynamic and stimulating field which is well-established and acknowledged as both an academic focus area and a profession thriving worldwide, including Africa within the last decade (Weinberg & Gould, 2011). Constant advancement is being made within sport leadership and sport motivation orientations and the two main purposes of studying sport psychology are: (a) to form a better understanding of how an individual's physical performance can be affected by psychological factors, and (b) to fully comprehend the effect of sport and exercise participation on a person's psychological health, development and well-being (Weinberg & Gould, 2011).

This chapter delineates the dominant initiatives that have been embarked on in the study of leadership and motivation in sport. The first section discusses the concept of leadership and provides a general overview of its role within the context of sport. In the second section, a review of the most widely accepted and supported motivational theories utilised in the research of sport is presented.

Approaches to Leadership

Leadership, as defined by Northhouse (2001, p. 3), is "the process whereby an individual influences a group of individuals to achieve a common goal". Within the sporting sphere, the coaches' scope of leadership extends to decision-making, motivation, providing feedback, establishing interpersonal relationships and guiding the athletes and team with assurance (Horn, 2008). In the following section, an overview of the most prominent approaches to leadership in general, as well as the application of these approaches to the sport setting, is provided. This is followed by a consideration of two conceptual sport-oriented interactional approaches to leadership.

Trait Approach

Introduced in the 1920s, the first approach to dominate literature on leadership was the trait approach. Assuming that effective leadership was not a function of learning, but brought into being by innate characteristics or personality dispositions, researchers strived to determine what the shared leadership traits were amongst successful leaders within business and industry. Considering these traits to be relatively stable and inherent, advocates of the theory claimed that leaders were born and not made and would attain success despite the situation (Crust & Lawrence, 2006).

Whilst it is recognised that selected traits may be beneficial for leaders to possess, these traits are certainly not sufficient for successful leadership and, as no shared leadership traits have been found to exist among coaches and exercise leaders, and enduring characteristics are considered in light of each situation, the trait approach is not widely used within the research of sport (Zaccaro, 2007). Following the trait approach, the contrasting behavioural approach was formulated.

Behavioural Approach

Behaviourists posited effective leadership to be a function of learned behaviour and the focus was shifted to identifying the universal behaviours of successful leaders. Assuming that an individual could effectively lead by adopting the behaviours of other eminent leaders, it was believed that leaders were made and not born (Crust & Lawrence, 2006). Sport-specific research utilising the behavioural approach has revealed that valuable leadership behaviours can be learned by coaches (Bloom, Crumpton & Anderson, 1999; Gilbert & Trudel, 2004; Smith, Smoll & Curtis, 1979). However, resting upon the assertion that a single collection of universal behaviours exists in distinguishing between effective and ineffective leaders is over-simplifying the position, as no sole behaviours have consistently been found to characterise successful leaders (Crust & Lawrence, 2006).

Seemingly, neither of these viewpoints, in isolation, is feasible in the present-day understanding of effective leadership. However, both the trait and behavioural approaches have likely advanced the knowledge base of researchers, leading to more multifaceted research designs and theoretical models.

Situational Approach

The evolution of a third approach to leadership emerged in the 1970s, emphasising that effective leadership is more reliant on the characteristics of the environment and situational factors than on the behaviours and traits of the specific leaders within these situations. It was believed by the theorists of the situational approach that the importance lay in the interactions between the leader, situation and participants and that the particular attributes and conduct of an effective leader would vary according to the environmental factors (Crust & Lawrence, 2006; Vroom & Jago, 2007).

Despite the lack of endorsement the situational approach receives from contemporary leadership researchers, it has facilitated our understanding of the key effects and value situational features have in ensuring effective leadership (Weinberg & Gould, 2011).

As previously noted, no one set of behaviours or personality dispositions ensures successful leadership – effective approaches to leadership are situation specific and leadership styles can be altered. Thus, the above three approaches were collectively used in forming the interactional perspective, the dominant approach currently utilised in the study of leadership (Crust & Lawrence, 2006; Vroom & Jago, 2007; Weinberg & Gould, 2011).

Interactional Approach

The majority of social scientists with an interest in leadership have discarded the deliberation between individual qualities and situational factors and have adopted the notion that an array of concepts exists, proficient in managing the diversities of both situations and leaders and, as a result, various interactional models of leadership have subsequently been proposed (Hackman & Wageman, 2007; Horn, 2008; Vroom & Jago, 2007).

Professionals within the sporting arena are required to be flexible and adapt their leadership styles as the situation demands and, therefore, the interactional approaches to leadership hold notable implications for effective leadership in sport settings (Weinberg & Gould, 2011).

Progressing from the notion that effective leadership is a result of the interaction between the individual styles and qualities of the leader and the social environment, Burns (1978) maintains that successful leadership entails exchange processes between leaders and followers and thus introduced the theory of transactional and transformational leadership, to be discussed next.

Transactional-Transformational Leadership Paradigm

Derived from Burns (1978) and elaborated by Bass (1985), the transactional-transformational conceptualisation of leadership is yet another approach that has been applied to leadership in various contexts, including business, education and the military (Bass, 1997).

Transactional leadership entails a process of social exchange, in which followers receive direct rewards, praise and resources and avoid disciplinary actions for agreeing and complying with the leader and for effective performance. Transactional leaders clearly outline the task at hand, as well as the required performance, and proceed to passively monitor the execution of the subordinates (Burns, 1978).

Transformational leadership, in contrast, involves working toward the objective of developing followers to their optimal potential, through the building of relationships rooted in personal, emotional and inspirational interactions between the leaders and followers. Increased levels of individual and group performance and satisfaction are achieved through transformational leadership as compared to a transactional leadership style, in a wide range of contexts, such as the military, business organisations, sport management and education (Bass, Avolio, Jung & Berson, 2003; Davis, 2002; Harvey, Royal & Stout, 2003).

It has been suggested by Rowold (2006) and other researchers (Jones, 2002; Hsu, Bell & Cheng, 2002), that transformational leadership is a valuable approach to studying the leadership styles and behaviours of coaches within the sport domain, as (a) the validity of transformational leadership has been proven in a variety of organisations; and (b) the motivation and performance of followers has been found to be closely associated with transformational leadership. Nevertheless, despite the high impact transformational leadership had on outcomes such as followers' satisfaction and performance within various settings, conceptual and theoretical examinations, empirical studies and applications to the

field of sport are extremely limited (Callow, Smith, Hardy, Arthur & Hardy, 2009; Rowold, 2006; Vidic & Burton, 2011; Yukl, 2002).

Interestingly, recent literature by Haslam, Reicher and Platow (2011) has drawn attention to what they believe to be "missing" concepts in the previous works of leadership. Suggesting that leadership is not only the relationship between leaders and followers but the relationship between leaders and followers within a social group led these authors to the development of the 'new psychology of leadership' – an identity-based leadership approach. Emerging from a non-individualistic, context-sensitive point of reference, Haslam, Reicher and Platow (2011) consider leadership to be based on the interaction of both the leaders' and followers' motivation and actions.

Despite the influence of the study of general leadership theories derived from outside the sport context, the attempt to transpose these theories to sport settings has resulted in sport-specific research providing minimal support for these leadership approaches (Crust & Lawrence, 2006; Horn, 2008). Whilst the theories and research from non-sport settings paved the way for understanding the concept of leadership through the provision of constructive frameworks, more sport-specific approaches, exhibiting the unique demands of the sporting context, were required (Horn, 2008). Thus, taking into consideration both individual and situational factors, as well as the interaction of these factors, two sport-specific interactional approaches were developed for the purpose of providing direction and guidance to examining leadership in sport (Weinberg & Gould, 2011). These approaches are presented next.

Sport-Oriented Interactional Approaches to Leadership

Just as leaders of formal organisations endeavour to maximise organisational performance by merging a particular leadership style with their position of power, coaches too recognise their leadership behaviour as being a critical psychological skill in sport which plays a vital role in successful sporting performance. Literature suggests that the leadership

behaviour and interpersonal style displayed by the coach can have a significant effect on the psychological and emotional well-being, physical effects and performance of athletes (Callow, et al., 2009; Duda, 2001; Gould, Greenleaf, Chung & Guinan, 2002; Horn, 2008; Reinboth, Duda & Ntoumanis, 2004). Therefore, the majority of research oriented toward the area of coaching effectiveness, conducted within the past three decades, has been aimed toward identifying particular coaching characteristics, leadership styles, competencies, behavioural patterns, cognitions and practice strategies and techniques that prove to be most effective in facilitating the psychosocial growth and performance of the athletes (Horn, 2008). Effective coaching is defined as "that which results in either successful performance outcomes (measured either in terms of win-loss percentages, individual player development, or success at the national or international level) or positive psychological responses on the part of the athletes (e.g., high perceived ability, high self-esteem, intrinsic motivational orientation, or high levels of sport enjoyment and satisfaction)" (Horn, 2008, p. 240). The two conceptual interactional approaches to coaching effectiveness to be discussed are:

(1) The Cognitive-Mediational Model of Leadership (Smoll & Smith, 1989); and

(2) The Multidimensional Model of Sport Leadership (Chelladurai, 1978, 1990, 2007).

1) The Cognitive-Mediational Model of Leadership

The theoretical model of leadership behaviour, proposed by Smoll, Smith, Curtis and Hunt (1978), originally consisted of (a) coach behaviours; (b) athletes' recollections and experiences of those specific behaviours; and (c) athletes' evaluative reactions. However, considering the fact that the cognitive processes surrounding these perceptions, recollections and responses proved to be just as important as the behaviours, the authors (Smoll & Smith, 1989) revised the model to incorporate situational and individual difference variables which would invariably influence the above-mentioned cognitive processes and behaviours of both the coach and athletes. Thus, Smoll and Smith's (1989) model now emphasises the

interactions between individual, cognitive, behavioural and situational difference variables, contending that the most effective coaching behaviours will adapt according to the situational aspects within the sporting context, such as type of sport or level of competition. In addition, the effect a coach's conduct has on each athlete will also be mediated by the significance and connotation the athlete attributes to those behaviours and not by situational factors alone. The elemental thrust of the meditational model was distinctly articulated by Smoll and Smith (1989): "A truly comprehensive model of leadership requires that consideration be given not only to situational factors and overt behaviours, but also the cognitive processes and individual difference variables which mediate relationships between antecedents, leader behaviours, and outcomes" (p. 1532). Thus, the cognitive-mediational model proposes that, firstly, the leadership behaviour exhibited by the coach is as a result of (a) the coach's own personal dispositions (characteristics, goals, motives, intentions); and (b) the variables of the situation (nature and type of sport). Secondly, the athletes' interpretations and evaluative reactions to the coach's behaviour will depend largely on each of their individual cognitive processes and characteristics (e.g., age, gender, traits, achievement motivation) and, once again, the situational factors.

In order to remain impartial in assessing the actual behaviour of coaches within natural field settings, concurring with the proposition of their model, Smith and associates (1977) developed the Coaching Behaviour Assessment System (CBAS) as a measure of leader behaviour. This measurement is an observational scheme, where 12 categories of leader behaviours (broadly classified as either reactive or spontaneous) are observed and recorded. Sport-related research based on the CBAS has found that facilitating positive interactions between coaches and young athletes results in numerous positive outcomes, such as increased self-esteem, greater levels of enjoyment, decreased anxiety, increased participation in sport and a lower dropout rate (Barnett, Smoll & Smith, 1992; Smith &

Smoll, 1997; Smoll, Smith, Barnett & Everett, 1993). Further research conducted by Black and Weiss (1992), using the CBAS, found that coaches' constructive approaches to feedback patterns have a positive effect on the motivational orientations of athletes. In addition, Smith, Smoll and colleagues have developed various training programmes for coaches with the findings that these programmes have a positive impact on both the coaches and players (Smith & Smoll, 1997; Smith, Smoll & Barnett, 1995; Smith, Smoll & Christensen, 1996; Smith, Smoll & Cumming, 2007).

Although Smith and Smoll (1990) have cautioned that the CBAS fails to measure some important aspects of coaching behaviours (e.g., verbal and nonverbal responses), Chelladurai and Riemer (1998) concluded that it is a thorough system capturing the majority of consequential coaching behaviours, and commended Smith and Smoll on one of the most comprehensive leadership scales within sport.

An alternative interactional model, developed exclusively for sport and physical activity, is Chelladurai's (1978, 1990, 2007) multidimensional model of sport leadership, which follows.

2) Multidimensional Model of Sport Leadership

Chelladurai (2007) considers effective leadership to be dynamic and centred on an intricate sequence of interactions between the leader, group members and situational constraints. To reflect this dynamism of leadership, the multidimensional model identifies leadership from three perspectives: (1) leadership styles preferred by the athletes; (2) leadership styles required by the athletes; and (3) the actual leadership style employed by coaches (Crust & Lawrence, 2006; Turman, 2001). More specifically, the effectiveness of these leadership behaviours can be multidimensionally measured by the achievement of successful performance outcomes and athlete satisfaction (Horn, Bloom, Berglund & Packard, 2011). That is to say, positive outcomes of performance and satisfaction can be

obtained in an environment where congruency between the three above-mentioned components of the coach's leadership can be found. Furthermore, each of these components or constructs is, in turn, determined by related antecedents (Horn, 2008). Firstly, the athletes' preferred leadership style will primarily be determined by the individual characteristics of the athletes (age, gender, ability and psychological traits) and the situational factors (social norms, cultural values and expectations). Secondly, the specific leadership behaviour required by the situation will be ascertained by particular aspects of the actual sport situation (type of sport, goals, programme structure and socio-cultural environment), together with the characteristics of the individual athletes. Finally, the actual leadership style exhibited by the coach will be directly determined by the personal characteristics of the coach (gender, age, experience, coaching style and personality), the situationally shaped requirements (sport competitive level) and the individual preferences of each athlete.

To adequately test the constructs of this model, the Leadership Scale for Sports (LSS) was developed (Chelladurai & Saleh, 1980). Consisting of 40 items, it allows for the assessment of five dimensions of coaches' leadership behaviours, from the perspectives of both the coaches and athletes. The five behavioural-specific elements are: (1) training and instruction; (2) democratic behaviour; (3) autocratic behaviour; (4) social support; and (5) positive feedback. Studies using the LSS have shown that the leadership dimensions most positively related to, or predictive of, athletes' level of satisfaction are those of democratic behaviour, training and instruction, positive feedback and social support. Dissimilarly, autocratic behaviour is linked to low levels of athlete satisfaction (Chelladurai & Riemer, 1998). Studies have also concentrated on the antecedents that affect leader behaviour, namely age groups (Martin, Jackson, Richardson & Weiller, 1999); similarities in gender preferences for specific coaching styles (Horn, 2008) and the difference in preferences reflected in type of sport (Riemer & Chelladurai, 1995). Furthermore, coaching behaviours perceived as

democratic and high in social support, positive feedback and training and instruction have resulted in more cohesive teams (Gardner, Shields, Bredemeier & Bostrom, 1996) and an increase in motivational orientations (Amorose & Horn, 2000; Vallerand & Losier, 1999). Finally, it has been revealed that team-sport athletes find positive coaching behaviours of greater consequence than what individual-sport athletes do (Baker, Yardley & Côté, 2003). Overall, the results of studies conducted to assess the correlation between a coach's leadership style (as measured by the LSS) and the various aspects of athletes' psychosocial responses indicate that the most effective leadership styles in facilitating the performance and psychological well-being of athletes are democratic behaviour, training and instruction, social support and positive feedback.

As the research cited in this chapter indicates, consistent and compelling empirical evidence exists signifying that the self-perceptions, level of motivational orientations and psychological and emotional well-being of athletes are significantly affected by the leadership style exhibited by the coach and, although the multidimensional model of leadership and the mediational model of leadership are both comparable and divergent in many aspects, neither of these two sport leadership models critically distinguishes between sport as pursuit of pleasure or pursuit of excellence (Chelladurai, 2005). As stated by Chelladurai (2007), the pursuit of excellence, by definition, is characterised by "progressive increases in physical, mental, and emotional capabilities, which, in turn, lead to performance increments" (p. 127) and the existing instruments of leadership in sport do not fully capture the leadership behaviours or influences that facilitate this process of pursuing excellence.

Furthermore, Duda (2001) contends that neither of these models features variables which reflect the motivational processes stemming from contemporary theories of motivation. The leadership provided by the coach is primarily instrumental in enhancing the motivation of the athletes and, in turn, the athletes' motivational state ultimately serves as the

source of performance effectiveness (Chelladurai, 2007). In sport, motivation is recognised as the foundation of performance and achievement and is deemed an essential ingredient for success. Without motivation, even the most talented athletes are unlikely to meet their optimal potential (Hagger & Chatzisarantis, 2005; Treasure, Lemyre, Kuczka & Standage, 2007). Therefore, the following section of this chapter will be dedicated to reviewing various theories of motivational orientations within sport.

Motivation

Motivation is considered a phenomenon explaining the direction, intensity and duration of voluntary behaviour (Carson & Chase, 2009) and, for over two decades, this phenomenon has been a topic of interest in sport psychology, identifying numerous social-contextual and interpersonal factors as latent determinants of human behaviour, and the greater part of scientific studies corroborate that it is crucial in the achievement of adherence in athletic performance (Almagro, Sáenz-López & Moreno, 2010; Ulrich-French & Smith, 2009). Moreover, optimal motivation, comprised of a high quality and high quantity of motivation, is essential for practising sport and maintaining excellent psychological health (Mouratidis, Vansteenkiste, Lens & Sideridis, 2008). The most prominent theories of motivational orientations utilised within sport psychology form the next topic of discussion.

Theories of Motivational Orientations in Sport

Within this motivation-rich environment of sport, research and literature has focused more specifically on understanding motivational orientations as related to achievement. The beliefs, values and goals individuals embrace and the relevance of these factors in effecting performance where superiority is key, have been a foremost focus of motivational theorists (Wigfield, Eccles, Schiefele & Roeser, 2008). As documented by various authors (Horn, 2008; Leidl, 2009; Wang, Koh & Chatzisarantis, 2009; Weiss & Amorose, 2008), some of the most widely accepted and supported motivational theories and conceptual models

dedicated to the understanding of performance, motivation, achievement and coaching leadership in the sporting context are: (1) Attribution Theory; (2) Competence Motivation Theory; (3) Achievement Goal Theory; and (4) Expectancy-Value Model. These theories and models are discussed in chronological order in the following section.

1) Attribution Theory

The establishment of the contemporary literature available on attributions can be traced back to the work of Heider (1944), who is considered to be the founding father of attribution theory. The attribution theory is a social-cognitive theory of motivation, developed to describe the explanations we give for the behaviour of people and perceived causes of events. The majority of research conducted on attributions in the area of sport has been centred around the workings of Weiner (1972), who made a significant contribution to the attribution theory within achievement contexts, which is thus more directly applied to the sporting environment. Weiner (1985a) extended the research to discovering connections between attributions and emotions, behaviour, social conduct and expectancies for future success. Furthermore, sport-related attribution research has focused on four main areas: (1) attributional bias; (2) predictors of attributions; (3) consequences of attributions; and (4) attribution retraining (Hanrahan & Biddle, 2008).

In applying this theory to motivation, the basic notion is held that an individual's own perceptions (attributions) for their successes or failures will have bearing on present and subsequent motivation, as well as the amount of effort that will be expended on achieving in the activity in the future (Biddle, Hanrahan & Sellars, 2001). The assumption is that the individual will interpret the situation in such a manner as to preserve a positive self-image (attributional bias) and ascribe the success or failure to one of four causal beliefs, namely ability, effort, task difficulty and luck (Hanrahan & Biddle, 2008; Miller & Ross, 1975). Further, in order to make these beliefs comparable, Weiner (1972; 1985a; 1985b) identified

three underlying causal properties, which form the very basis of the attributional approach to motivation:

- *Locus* refers to the location of cause, internal or external. Do the factors contributing to the success or failure originate within the individual or within the environment?
- *Stability* refers to the duration of a cause, stable (constant) or unstable (temporary). If a cause is stable, the same behaviour will always produce the same outcome. If unstable, the outcome produced will be different on each separate occasion.
- *Controllability* refers to the extent to which each individual's actions can determine the outcome, controllable or uncontrollable. A controllable factor can be altered, should one so wish, whilst an uncontrollable factor is one that the individual believes cannot be managed.

(It should be noted that, within this theory, locus and control are independent of each other and relate particularly to value or states of emotion such as pride, guilt and shame) (Weiner, 2000).

Hence, the four causal beliefs can be placed within a three-dimensional causal space and classified as follows (Weiner, 2000):

- *Ability* is an internal, stable factor over which the individual has little control.
- *Effort* is an internal, unstable factor over which the individual has a large amount of control.
- *Task difficulty* is an external, stable factor beyond the individual's control.
- *Luck* is an external, unstable factor over which the individual has no control.

Weiner (2000) further states that the causal properties are significant in the sense that they eventually lead one to the two core determinants of motivation: expectancy (the subjective probability of subsequent success) and value (the emotional consequence of success or failure in attaining the goal). The expectancy of success (thoughts), together with

the emotional consequences (value), will ultimately establish the ensuing behaviour of the individual (consequences of attributions). Hanrahan, Cerin and Hartel (2003) found that competitive athletes with an attributional style for positive events (i.e., stable, internal, personally controllable and intentional) significantly predicted higher levels of self-rated performance, coach-rated performance and athletes' persistence.

Numerous studies have been conducted in an attempt to identify the potential predictors of attributions that people make within sport contexts (Hanrahan & Biddle, 2008). It appears that no significant differences due to age (Chase, 2001; Hamilton & Jordan, 2000), gender (Hanrahan & Gross 2005) or type of sport (Leith & Prapavessis, 1989) have been identified. Variables which have, however, been found to influence attributions include level of expertise (Cleary & Zimmerman, 2001), task orientation (Hanrahan & Gross, 2005) and team cohesion (Patchell, 2004).

Moreover, ineffective attributions leading to deficits in one's cognitions, emotions and behaviour may be substituted by more appropriate, beneficial attributions through attribution retraining, in order to ensure constructive expectancies for future performance, motivation and success (Hanrahan & Biddle, 2008). Demonstrating the effectiveness of attribution retraining in sport settings, studies show that, firstly, attributions can be changed (e.g., increasing perceptions of control) and, secondly, these changes positively relate to alterations within performance and motivation variables (Orbach, Singer & Murphey, 1997; Orbach, Singer & Price, 1999; Sinnot & Biddle, 1998).

The attribution theory also allows for the consideration of the effects of a rich social context on achievement performance. As success and failure within achievement domains do not occur within a vacuum, the social environment (parents, coaches and peers) is considered to make a substantial contribution toward the individual's performance (Weiner, 2000).

Whilst this theory is ending its third decade as a concept in motivation, a relatively unexplored area is the comparison of attributions in individual and team performance and further progress and elaboration has been recommended for future findings in the attributions of coaches (Hanrahan & Biddle, 2008).

2) Competence Motivation Theory

Based on the work of Susan Harter (1978), the competence motivation theory suggests that the decisive factors of ensuing motivation are the perception of competence associated with demonstrated mastery. This theory, assuming the stance of a developmental perspective, explains that individuals endeavour to advance to a level of competence by seeking to master a task or activity (mastery attempts) in any specific achievement domain, including sport. Obtaining success at optimal challenges results in strong cognitive (favourable self-perception), affective (positive affect) and behavioural outcomes and these, in turn, contribute to the development of intrinsic motivation (competence motivation) to continue with participation. Thus, according to Harter, perceived competence associated with successful performance is a critical determinant of subsequent participation motivation (Weiss, Amorose & Wilko, 2009). Furthermore, as achievement behaviours occur within social contexts, a vital influence on the perceived competence and ensuing motivation of the individual is the positive reinforcement and feedback received from significant role players (socialising agents) (Weiss & Amorose, 2008).

The developmental stance of the theory allows for the understanding that there are age-group differences in the conceivability of competence throughout the cognitive and social evolvement of an individual and, therefore, cognitive maturation and positive socialisation allow children to progress from focusing and depending on external goals and social reinforcement to directing their concentration toward the reliance of internal criteria, self-rewarding behaviour and judgements in defining success. Should this developmental

process not occur, a contrasting scenario will unfold and the resulting effect of unsuccessful mastery attempts and inappropriate reinforcement would be poorer self-perceptions, increased anxiety and the shaping of an extrinsic motivational orientation. During childhood, the contingent and affirmative feedback provided for attempts and progress fosters perceived ability, positive affect and competence motivation. By early adolescence, perceived ability is found to be more accurate (Weiss & Amorose, 2008). According to the theory, the variation in the level and accuracy of perceived competence among youth should congruently display a variance in the motivational orientations and cognitive and affective responses (Weiss & Amorose, 2005).

Harter (1990) highlighted the role of significant others as a predictor of self-conception throughout an individual's life span. However, the central source of support will vary developmentally. Constructive critique (commending, instructing) and destructive critique (criticising, pressurising) are shown to be related to competency beliefs, emotional responses and orientations of motivation (McCann, 2006; Weiss & Fretwell, 2005). Parents, together with coaches, serve to be powerful socialising agents within the realm of sport. A coach's response to performance, quantity and quality of feedback and the way the environment is structured all have a significant impact on the perceptions, emotions and motivation of the athlete. The coach's views and approach are of utmost importance in shaping the athletes' perceptions of competence within their sport (Amorose, 2002 & 2003). Another focal source of information in judging one's competence is the rating of performance in comparison to peers and by the rating of performance by peers. In general, peers are influenced by each other's beliefs, emotions and motivational orientations and a strong relation has been found to exist between peer acceptance and competence motivation variables (Ullrich-French & Smith, 2006).

Thus, successful performance resulting in perceived competence, perceived control (degree of understanding who/what is responsible for the success/failure) and reinforcement by significant others (parents, coaches, peers) leads to an experience of positive affect and an enhanced competence motivation to continue participating in the specific area of achievement, as is shown in the studies conducted by Black and Weiss (1992), Horn (1985) and Smoll and Smith (2002). By examining the interaction between the perceptions of competence, satisfaction, motivational orientation and attrition rates of adolescent athletes and coach feedback given contingent to performance attempts, these authors discovered the following, as reported by the athletes: (a) frequent praise and informational feedback following a successful performance and technical instruction and encouragement following an undesirable performance both led to an increase in competence beliefs; (b) receiving criticism related negatively to the variables of competence motivation (Black & Weiss, 1992; Horn, 1985; Smoll & Smith, 2002). In addition to identifying the effects of coaches' reflected appraisals, Amorose (2002; 2003) concluded that the perceptions of teammates' convictions with regards to one's ability within the sport are strongly related to the self-reported competence of athletes.

As can be deduced from this motivational theory, many individual differences (feelings of autonomy and goal orientations) and social-contextual factors (parent influence and peer-group acceptance) are representative of sources of perceived competence, satisfaction, enjoyment and motivation amongst youth. Also, the coach seems to play a particularly pivotal role amongst adolescents.

3) Achievement Goal Theory

Achievement goal theory is one of the foremost conceptual approaches used to describe and explain motivated behaviour and Nicholls (1984) defines the distinguishing element of achievement behaviour as the goal of competence or perceived competence:

> Achievement behaviour is defined as behaviour directed at developing or demonstrating high rather than low ability. It is shown that ability can be conceived in two ways. First, ability can be judged high or low with reference to the individual's own past performance or knowledge. In this context, gains in mastery indicate competence. Second, ability can be judged as capacity relative to that of others. In this context, a gain in mastery alone does not indicate high ability. To demonstrate high capacity, one must achieve more with equal effort or use less effort than do others for an equal performance. (Nicholls, 1984, p.328)

His theory of achievement transpired from a developmental notion that an individual progressively emerges into drawing distinctions between ability, effort, task difficulty and luck and adds the assumption that individuals then define success in an achievement task and construe competence in two contrasting forms of achievement goals. These two goals focus on differences in each individual's subjective experience, behaviour, situational factors and aspects of the self and are referred to as *task involvement* and *ego involvement* (Nicholls & Miller, 1984).

Task involvement entails individuals emphasising self-improvement, effort and mastery of tasks in developing a sense of competence, irrespective of others and their abilities (Harwood, Spray & Keegan, 2008). Research within the educational and sporting arenas (Duda, 1989; Duda & Nicholls, 1992) has found that task orientation is unswervingly correlated with the belief that success is a result of personal improvement, hard work and collaboration with others and that sport and education provide individuals with these opportunities for mastery and personal growth. Furthermore, the purpose of sport is to promote cooperation, social responsibility and mastery, resulting in reported satisfaction, increased enjoyment and intrinsic motivation (Ntoumanis & Biddle, 1999; Ntoumanis, Biddle

& Haddock, 1999). In exploring how athletes cope with anxiety and stress-related issues, a further research strand has found that problem-solving, exhibited effort, coping strategies and sought-after social support are associated with task involvement (Ntoumanis, Biddle & Haddock, 1999).

Ego involvement is a perceived ability of the self in comparison with the attainment and abilities of others and developing a sense of competence only when performance is superior to that of others or equal to others when expending less effort. Success is defined by using normative criteria, high ability, outperforming others and at times utilising deceptive strategies (Harwood, Spray & Keegan, 2008). The purpose of sport is believed to revolve around increasing one's social status, popularity and wealth (Duda, 1989) and, when associated with an ego orientation, it brings no level of satisfaction, enjoyment or intrinsic motivation (Biddle, Wang, Kavussanu & Spray, 2003). With regards to athletes' coping with anxiety and stress, numerous negative feelings and the venting of these emotions are associated with ego involvement (Ntoumanis, Biddle & Haddock, 1999).

Human behaviour, however, cannot be oversimplified by asserting that there is a positive correlation between good behaviour and task orientation or bad behaviour and ego orientation, as a theoretical independence exists between these goal orientations (Harwood, Spray & Keegan, 2008). In fact, a study conducted with elite young athletes revealed that those athletes high in both goal orientations made significantly more use of psychological skills such as imagery, goal-setting and self-talk strategies (Harwood, Cumming & Fletcher, 2004). The interactive nature of the theory indicates that the adoption of each of the goal orientations in a specific achievement activity is dependent on the natural inclination of the individual, together with the particular environmental cues of the activity. These propositions, however, have not been fully examined within the area of sport (Harwood, Spray & Keegan, 2008). On the contrary, social approval from significant others has been omitted from the

conceptualisation of Nicholls' theory (1984), noting that the blending of social goals with task or ego goals could result in our understanding of motivation being confounded.

As the context of competitive sport is decidedly a social achievement, understanding social approval and the role it plays is a worthy area requiring further investigation.

4) Expectancy-Value Model

Formulated within a developmental perspective by Eccles and colleagues (Eccles, et al., 1983), this comprehensive model views achievement behaviour from a multidimensional standpoint and elucidates the differences in youths' choices, persistence and performance across various achievement domains. The expectancy-value model depicts achievement choices and behaviour to overtly be influenced by two primary determinants. Firstly, the expectancies of success ("Can I do this task?") or beliefs of competence consistently appear to be strong predictors of achievement behaviour. Secondly is the subjective task value ("Do I want to do this task and why?") or the importance an individual places on being successful within a specific domain. Four components of subjective task value were identified by Eccles and her colleagues (1983), namely: (1) attainment value (importance of succeeding, confirming self-identity); (2) interest value (intrinsic rewards); (3) utility value (extrinsic rewards); and (4) cost (time, energy and opportunities utilised by engaging in the chosen activity). Indirect determinants influencing achievement behaviour include cognitive (self-schema, perceived task difficulty), affective (memories of achievement experiences) and social-contextual (beliefs and behaviours of adults and peers, cultural norms and environmental structure) factors that significant adults impart, model and decipher for youths, which have an unquestionable impact on their competency beliefs, task value and achievement ability (Weiss & Amorose, 2008).

The conceptualisation of this model stems from gender variations in ability beliefs and subjective task value and, together with differing achievement behaviours occurring

within varying social contexts (cultural norms, stereotypes and behaviour of significant adults), has resulted in a considerable amount of studies being conducted on these constructs within the sporting context. By testing the expectancy-value model with youths in the sporting domain, findings include gender differences and stereotyping in ability beliefs and competency ratings, expectancies of success, value toward sport and achievement behaviour (Bois, Sarrazin, Brustad, Trouilloud & Cury, 2002; Bois, Sarrazin, Brustad, Chanal & Trouilloud, 2005; Fredricks & Eccles, 2002; 2005). Fredericks and Eccles (2002) also reported, in a longitudinal study, that competency beliefs in sport progressively decrease with age, as does attainment value, whilst interest value remains high. These findings were corroborated with similar results obtained by Rodriguez, Wigfield and Eccles (2003) and Jacobs, Lanza, Osgood, Eccles and Wigfield (2002). In addition, it has been suggested by Weiss and Williams (2004) that there is a noteworthy association between the motivational climate (coaching style and social support) and beliefs of competency, task values and motivated behaviour. Thus, Eccles' model advocates that the coaching philosophy and style together with other varying social contexts have significant effects on the participating individuals' expectancies, value and participation within their specific area of achievement.

The concept of motivation can best be envisaged as the *because* answers to numerous *why* questions (Weiss & Williams, 2004). Through the evolution of research on participation and achievement motivation in sport, three common themes emerge as the elemental components of understanding motivation – competence, social acceptance and enjoyment. Whilst the theories reviewed in this chapter differ in their theoretical antecedents, common traits are shared in that the social-contextual perspective (coaching style, motivational climate and feedback) is dominant and individual differences (perceived competence and perceived control) are emphasised.

Be that as it may, these theories have treated motivation as a unitary concept by focusing solely on the overall amount of motivation that drives individuals towards certain behaviours and activities (Deci & Ryan, 2008b). Heeding to this limitation in the study of motivation, the self-determination theory (a macrotheory of human motivation) began by differentiating types of motivation, maintaining that the form or quality of an individual's motivation would be of greater magnitude than the total quantity of motivation in predicting life's important outcomes such as effective performance and psychological health (Deci & Ryan, 2008a; 2008b).

The self-determination theory presupposes that humans are by nature self-motivated, energetic, interested and willing to succeed, as success in itself is personally satisfying. At the same time, the theory acknowledges that humans can also be passive and alienated. These individual differences are accounted for in terms of the types of motivation, emerging from the interaction between an individual's innate dynamic nature and the social environments that either facilitate or frustrate that nature (Deci & Ryan, 2008b). Moreover, the domain of sport has embraced self-determination theory, due to the fact that it is the sole theory of human motivation to not only acknowledge intrinsically motivated behaviour but also ascertain the causes of enhancement or encumbrance of this motivation (Ryan & Deci, 2007).

The field of sport is vibrant and dynamic and should be researched within a theory matching these characteristics. It is for this reason that the pioneering and innovative self-determination theory was adopted as the conceptual framework for the current study. This theory will be discussed at length in Chapter Three.

Summary and Conclusion

The collective theory and research reviewed in this chapter have clearly indicated that the self-perceptions, level of motivational orientations and psychological and emotional well-being of athletes explain and predict their behaviour within their sport. In addition, these

psychological characteristics are significantly affected by the leadership style exhibited by the coach. Thus, in order to gain a more accurate and comprehensive interpretation of athletes' sporting behaviour, the socio-environmental influences need to be taken into account. As one of the core objectives of self-determination theory is to grasp the effect of the social environment on an individual's motivation, well-being, affect, and behaviour, it is the theory of choice in providing a conceptual framework for the current study.

CHAPTER THREE

Self-Determination Theory

An Introduction to Self-Determination Theory

Signifying an extensive framework for the study of human motivation, personality and well-being, Deci and Ryan's self-determination theory (SDT) distinguishes intrinsic motivation (rooted in the inherent satisfaction of the behaviour in itself), extrinsic motivation (behaviour that is instrumental in contingent outcomes, separable from the action) and amotivation (the state of lacking the intention to act) (Ryan & Deci, 2002). More importantly, SDT addresses the nature, determining elements and consequences of each motivational type, specifically related to the cognitive, affective and social development of individuals. Stating that "people are inherently motivated to feel connected to others within a social milieu (*relatedness*), to function effectively in that milieu (*competence*), and to feel a sense of personal initiative while doing so (*autonomy*)", Deci and Ryan (1994, p. 7) further contend that the satisfaction of these three psychological needs (*autonomy*, *competence* and *relatedness*) will predicate optimal functioning and psychological well-being.

The first part of this chapter is dedicated to a discussion of the five mini-theories comprising SDT. The focus then shifts to defining well-being and its operationalisation according to SDT, proceeded by the antecedents of well-being in sport. The chapter concludes with a review of the need-supportive environments believed to facilitate human motivation and psychological well-being.

The Formal Theory

Self-determination theory (SDT) is a contemporary theoretical perspective of human motivation and signifies fundamental issues such as development, universal psychological needs, aspirations, social-environmental impact and the interaction of culture and gender with motivation, and has been applied to a broad spectrum of life domains, including healthcare, education, parenting, work and sport (Deci & Ryan, 2008a).

Refined by over five decades of research, SDT is considered a meta-theory with an organismic dialectical approach, developed through a cluster of five mini-theories that, despite an exclusive involvement, share various fundamental assumptions. These five mini-theories, namely Cognitive Evaluation Theory; Organismic Integration Theory; Causality Orientation Theory; Basic Psychological Needs Theory; and Goal Contents Theory, together comprise SDT's formal framework (Standage & Ryan, 2012). Each mini-theory will be addressed in turn, with relations among the notions developed by three of the mini-theories represented schematically in Figure 1.

Cognitive Evaluation Theory (CET)

The cognitive evaluation theory, the first of the mini-theories, concerns intrinsic motivation and was developed to clarify the significance of a social context on an individual's intrinsic motivation (Deci, 1975; Deci & Ryan, 1985a). Intrinsic motivation, termed by SDT as "the inherent propensity to actively develop skills, engage challenges, and take interest in new activities even in the absence of external prompts or rewards" (Ryan & Deci, 2007, p. 2), represents a cornerstone of the theory's foundations. It was suggested by White (1959) that psychological satisfaction, experienced through feelings of competence, would fortify intrinsically motivated behaviour. deCharms (1968) supplemented this finding by concluding that the feeling that one has been the originator of one's own actions is a central component to intrinsic motivation. The cognitive evaluation theory encompasses both these views, by proposing that the experiences of competence and autonomy are indispensable in the escalation or upholding of intrinsic motivation (Deci & Ryan, 1985a).

Contexts or events within the social environment capable of positively or negatively impacting intrinsic motivation include rewards, deadlines, feedback and pressures and are believed to hold aspects of information and control (Deci & Ryan, 1985a). The controlling aspect concerns the need for autonomy and a *perceived locus of causality*. An *external locus*

of causality (behaviour perceived to be controlled by external factors) reduces feelings of autonomy and, consequently, intrinsic motivation, whilst an *internal locus of causality* (behaviour perceived to be determined by freedom of choice) will enhance feelings of autonomy and intrinsic motivation. The informational aspect concerns the need for competence. A boost in intrinsic motivation will occur when positive information, regarding one's ability, is provided. Conversely, negative information or feedback will lessen perceived competence and ultimately lower the degree of intrinsic motivation. In addition, CET suggests that the meaning an individual attaches to an event (referred to in SDT as *functional significance*) will promote or impede the intrinsic motivation of the person by determining the degree of autonomy and perceived competence sensed (Deci & Ryan, 1985a). It is important to note that CET also specifies that intrinsic motivation will not be enhanced or maintained by a sense of competence in solitary form, and that the feelings of competence should be experienced in the context of autonomy (Ryan, Williams, Patrick & Deci, 2009).

Although the focus has been on clarifying the importance of social-contextual factors, Deci and Ryan (1985a) maintain that both interpersonal and intrapersonal factors, such as achievement goals or beliefs regarding the nature of ability, can also significantly impact perceived competence, autonomy and, ultimately, intrinsic motivation.

Furthermore, Ryan and Deci (2002) also recognise an individual's need for social belonging / acceptance (relatedness) to be a determinant of intrinsic motivation. Nevertheless, it is maintained that intrinsic motivation is predominantly shaped by one's feelings of competence and autonomy. In the domain of sport, this function of competence and autonomy has been identified by CET as especially critical in the promotion of intrinsic motivation. According to Bartholomew, Ntoumanis and Thøgersen-Ntoumani (2009), research has uncovered six salient controlling strategies that coaches make use of to dominate athletes' behaviour by undermining their feelings of competence and autonomy and thus

diminishing their intrinsic motivation. These strategies include: the promising of tangible rewards; controlling (negative) feedback; excessive personal control by means of authoritative leadership; intimidation behaviours; the promoting of ego-involvement; and conditional regard.

As critical as intrinsic motivation may be to sport performance and athletes' wellness, extrinsic motivations also play an integral part in sustaining sport behaviours. There are two categories of non-intrinsic motivation delineated within SDT, namely extrinsic motivation and amotivation. The nature of extrinsic motivation will be the focus within the next mini-theory – the organismic integration theory.

Organismic Integration Theory (OIT)

The organismic integration theory explores the concept of extrinsic motivation in its various forms. Extrinsic motivation is defined within SDT as actions that are instrumental, or motivated by the pursuit of consequences that are separable from the behaviour itself (Ryan & Deci, 2002). Deci and Ryan (1985a & 2008a) further developed the theory by hypothesising that extrinsic motivation can be differentiated into an additional four degrees of behavioural regulation. *External regulation* involves engaging in behaviour to obtain rewards or avoid punishment. *Introjected regulation* describes engaging in an activity because of internal pressure, guilt or to obtain ego enhancement and entails the internalisation of past controls. *Identified regulation* entails undertaking an activity after accepting the value of and identifying with the activity. Finally, *integrated regulation* describes extrinsically motivated behaviour that is fully assimilated into the self and is in congruence with one's needs and value system. These behavioural regulations are organised along a continuum of internalisation, ranging from low (external regulation) to high (intrinsic motivation) self-determined behaviour, with external regulation and introjected regulation representing forms of controlled motivation, whilst identified regulation and integrated regulation represent

autonomous motivation. It is important to note at this point that, whilst many of the same attributes are shared between integrated regulation and intrinsic motivation, the former is still considered a type of extrinsic motivation as it remains instrumental to a separable outcome. According to Ryan and Deci (2002), OIT contends that the continuum is heuristic rather than developmental, indicating that individuals are able to internalise new behaviours at any stage. Furthermore, it suggests that a person's behaviour will be more autonomous the more internalised the extrinsic motivation, and particularly emphasises that support for autonomy and relatedness are regarded as critical to internalisation. OIT is also of the opinion that social contexts, together with personal characteristics, will once again predict the facilitation (adopting of values, goals or beliefs) or hindrance (resisting values, goals or beliefs) of internalisation, integration and autonomous regulation of behaviour (Ryan & Deci, 2002). In relation to the regulation of behaviour, more or less self-determined behaviour can be associated with various benefits and consequences, as studies conducted within the physical domain show more self-determined behaviour to be related to positive cognitive, behavioural and affective outcomes, as well as enhanced performance (Amiot, Gaudreau & Blanchard, 2004; Standage, Duda & Ntoumanis, 2005). A study conducted with elite Canadian swimmers, by Pelletier, Fortier, Vallerand and Brière in 2001, indicated that greater long-term persistence within their sport resulted from more autonomous forms of motivation (intrinsic and identified regulation), whereas external regulation and amotivation served to be strong predictors of rapid dropout.

As with extrinsic motivation, amotivation proves to be a complex category as there are numerous reasons why an individual could feel amotivated. Ryan and colleagues (2009) describe three distinct causes, identified within SDT, as to why one could experience feelings of amotivation. Firstly, a sense of competence in carrying out the activity is not experienced. This could be due to a lack of knowledge or necessary skills needed to act. Secondly, no

connection is viewed between the action involved and the desired outcome. Finally, the individual attaches no value to, or places no interest in the activity and simply does not want to act. An individual's progression from amotivation to intrinsic motivation has been shown to result in an increase of behavioural effectiveness, intentional persistence, conceptual understanding, positive coping and a general enhancement in well-being in various life domains (Deci & Ryan, 2000; Ryan & Deci, 2000 & Vallerand, 1997) and, more specifically, within the environment of sport and physical activity (Chatzisarantis, Hagger, Biddle, Smith & Wang, 2003; Vallerand & Losier, 1999). The assumptions and distinctions made in OIT have allowed for an extensive analysis of motivation in sport and should ultimately equip practitioners to utilise approaches to promote more self-determined motivation in sport (Weiss & Amorose, 2008).

Each individual's motivation is not solely a function of their environment, but also a result of enduring personal differences and characteristics that orient the individual toward environments and regulate their behaviour in a variety of ways. This motivational orientation forms the focus of the next mini-theory – the causality orientation theory.

Causality Orientation Theory (COT)

The third mini-theory focuses solely on the individual distinctions in people's inner resources in their general motivational orientation toward the social world, labelled by Deci and Ryan (1985b) as causality orientations, referring to the extent of an individual's self-determination across global situations and domains. Three main causality orientations are specified, namely the *autonomy orientation* (acting out of self-selected goals and interests or intrinsic motivation); *control orientation* (focusing on rewards, demands and approval or an external motivation); and the *impersonal orientation* (lacking the intention to act, having feelings of incompetence, consistent with amotivation). It is assumed that all individuals possess each of these orientations to a certain degree and that these can be used in predicting

a range of psychological or behavioural effects (Ryan & Deci, 2002). Studies conducted by Deci and Ryan (1985b) indicate that an individual's causality orientation that is high in autonomy orientation consistently leads to psychological health, such as an increased self-esteem and self-actualisation. Controlled orientation can be related to a diminished well-being and impersonal orientation is unfailingly coupled with negative affect and lack of vitality.

The causality orientation theory appears to be one of SDT's least researched concepts within the environment of sport and physical activity (Standage & Ryan, 2012; Weiss & Amorose, 2008). This lack of research could be attributed to the fact that COT's conceptualisation resides and operates across domains on a general level, rather than being domain-specific (Standage & Ryan, 2012).

Aspects consistently indicated throughout the discussion of these mini-theories are those of the fundamental components, supplied by the social environment, that facilitate the transpiring of autonomous / intrinsic motivation – referred to in SDT as *basic psychological needs*. These basic needs are discussed in further detail in the basic psychological needs theory that follows.

Basic Psychological Needs Theory (BPNT)

The basic psychological needs theory is one of the fundamental hypotheses underlying all constituents of SDT. From the initial development of SDT, it has been postulated that the impetus of the mentioned motivation orientations stems from the perceived satisfaction of three universal *basic psychological needs* for *autonomy, competence* and *relatedness* (Ryan & Deci, 2002).

Autonomy refers to the perception of choice and control over one's own behaviour and concerns acting from a place of integrated values and inherent interest.

Competence refers to the perception of mastery and a sense of efficacy in performance. It is a sense of confidence and not a capability or an attained skill.

Relatedness refers to the feeling of a secure connection with the significant others in one's social milieu.

Ryan and Deci (2002) further contend that all humans possess these three inherent psychological needs and, being essential components of human development, these needs have a purposeful impact, despite whether or not they are valued or particularly sought after. Thus, even though an individual might not deem these needs valuable, failure to satisfy them will result in a negative effect on motivation and well-being, whilst successful satisfaction of the needs will enhance one's motivation and well-being (Ryan & Deci, 2007). Hence, motivation will only be obtained, sustained or enhanced once there is the perception that these needs have been met. Perceived fulfilment of these needs provides the incitement for intrinsic motivation, while perceived lack of, or no fulfilment, is considered the incitement for extrinsic motivation and amotivation (Carson & Chase, 2009).

The three needs, defined as "nutriments", are regarded by Deci and Ryan (2000) as essential for human growth, development, optimal functioning and psychological well-being and would thus be critical to the physical and psychological functioning of athletes in reaching their optimal performance. Within the sporting context specifically, studies show the need for competence to be extensively regarded as an ultimate expression of motivation (Calvo, Cervello, Jiménez, Iglesias & Murcia, 2010; Reinboth & Duda, 2006).

The self-determination theory is also meaningful in explaining when human motivation will be experienced. Ryan and Deci (2002) maintain that individual diversity and characteristics of the social environment are determinants for fulfilling or undermining the three innate needs, which subsequently have compelling effects on one's motivation. SDT has labelled the socio-contextual environments that cultivate and satisfy the three needs as

autonomy-supportive (Deci & Ryan, 2008a). However, despite the term, an autonomy-supportive environment contributes equally to the satisfaction of not only autonomy, but also to competence and relatedness (Ntoumanis & Standage, 2009). A vast amount of empirical research in proving this premise has been embarked on within the sporting environment (Carson & Chase, 2009). It must be reiterated that although autonomy can be equated with independence by definition, within the SDT framework it concerns the self-endorsement of one's behaviour or the sense of volition (Lynch, Vansteenkiste, Deci & Ryan, 2011).

A concept, originally investigated under the umbrella of the basic psychological needs theory, pertaining to the study of the goal pursuits of individuals, is now defined within its own separate mini-theory, aptly titled the goal contents theory, to be discussed next.

Goal Contents Theory (GCT)

The fifth mini-theory, a complementary approach to the conceptualisation of quality of motivation, was recently introduced. The goal contents theory, originating from the work of Kasser and Ryan (1993; 1996), considers the individual differences in the goals (intrinsic and extrinsic) people value and how these goals relate to the individual's psychological well-being, motivation and adjustment. Wealth, fame and image are life goals labelled as extrinsic and, even when attained, are not directly correlated to the satisfaction of the basic psychological needs. Therefore, these extrinsic goals do not foster psychological health and well-being and are related to less optimal functioning. On the contrary, intrinsic life goals such as personal growth, close relationships and community involvement are conducive to need satisfaction, facilitating psychological health and wellness (Kasser & Ryan, 1996; Niemiec, Ryan & Deci, 2009). Kasser and Ryan (1996) also maintain, through various studies, that aspiring toward intrinsic goals positively relates to indicators of well-being (positive affect, vitality and self-actualisation), whilst external aspirations are related to negative indicators of ill-being such as depression, anxiety and lower life satisfaction.

Extrinsic aspirations are not related to positive outcomes, even if the external aspirations are attained. These findings have been replicated through studies with various cultures and age groups (Chirkov & Ryan, 2001; Hagger, Chatzisarantis, Barkoukis, Wang & Baranowski, 2005; Kim, Kasser & Lee, 2003; Ryan, Chirkov, Little, Sheldon, Timoshira & Deci, 1999).

In addition to the development of intrinsic motivation and internalisation, pursuing intrinsic goals is viewed as a third manifestation of the natural growth-oriented endowment of human beings, whereas extrinsic goals are related to the external expression of worth rather than the satisfaction of the basic needs (Vansteenkiste, Lens & Deci, 2006). Self-determination theory considers the satisfaction of the basic psychological needs of autonomy, competence and relatedness to be the cornerstones of psychological health, and the degree to which the internal and external goal aspirations provide need satisfaction will determine the long-term psychological health benefits or lack thereof (Vansteenkiste, Soenens & Lens, 2007).

Studies done with regard to the goal contents theory within the sport context reveal that, in addition to the motives of athletes, the types of goals adopted will vary significantly in terms of their motivational orientations. The impact of intrinsic versus extrinsic goal contents on persistence, well-being and performance will vary considerably (Vansteenkiste, Soenens & Lens, 2007). However, Chatzisarantis and Hagger (2007b) have pointed out that there are very limited investigations into the relationship between life aspirations and psychological well-being within the context of sport and physical activity.

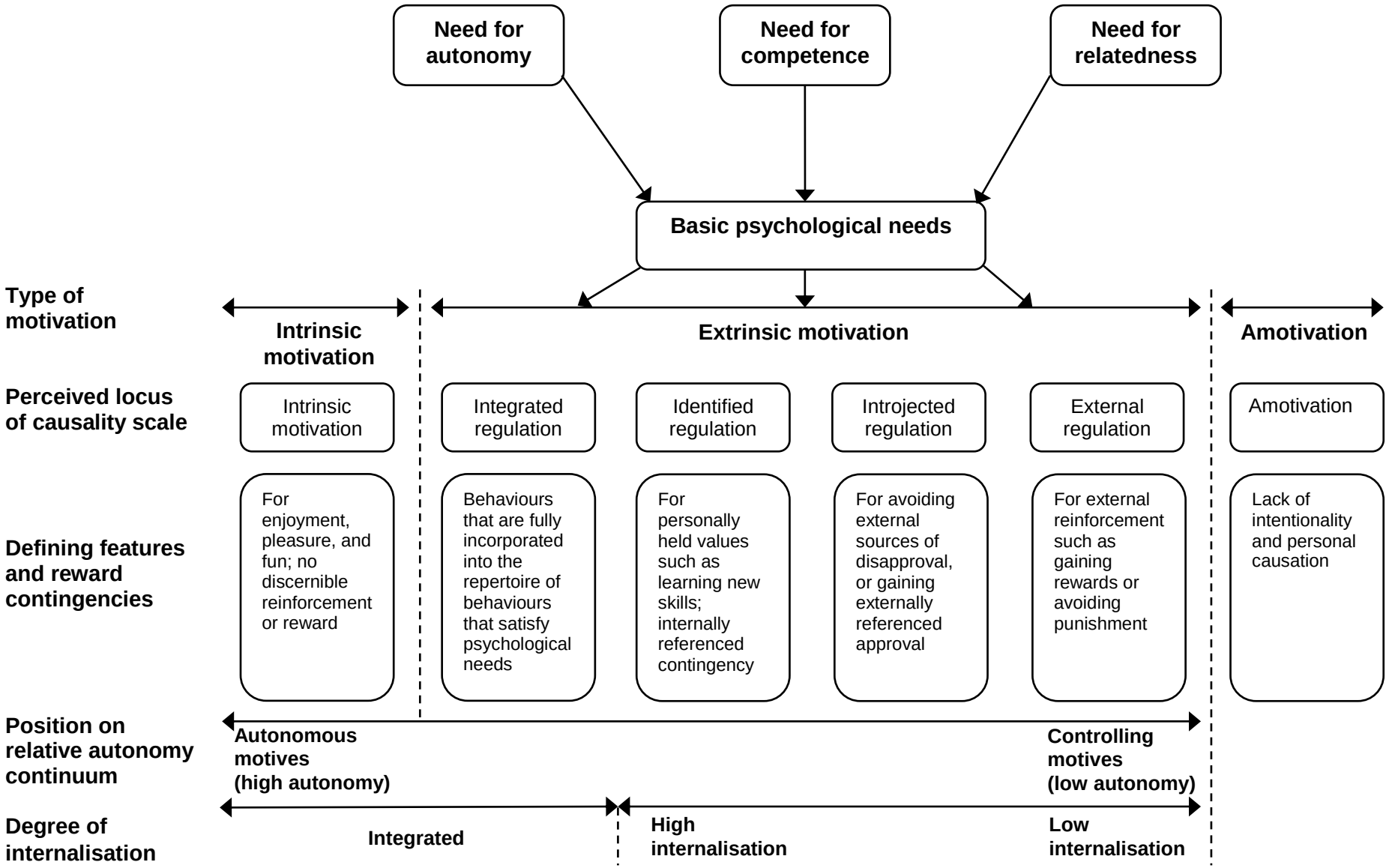

Figure 1. Schematic representation of self-determination theory illustrating the features of three of the component subtheories: Basic psychological needs theory, cognitive evaluation theory, and organismic integration theory (Ryan & Deci, 2007, p. 8)

To summarise this overview: self-determination theory is an empirically based theory of human motivation, focusing specifically on the interaction between an individual's innate active, growth-oriented nature and the social contexts or environments that either support or thwart the individual's attempts to engage and master new challenges. SDT is in fact a macro-theory, comprised of five sub-theories developed to provide in-depth hypotheses explaining the main theory's core predictions of human behaviour and functioning. CET concentrates on the construct of intrinsic motivation and the significant effects the social context has on an individual's intrinsic motivation. OIT describes extrinsic motivation with its varying degrees of behavioural regulation and specifically focuses on the internalisation of extrinsic motivation in striving toward more autonomous behaviour. COT describes self-determined behaviour through the concepts of autonomous (acting with a sense of volition, choice and self-determination) and controlled (behaving out of a sense of internal or external pressure or demand) motivation, the global individual differences in self-determination and each individual's motivational orientation toward the social world. At the heart of SDT is the concept of the BPNT and its relation to goal-directed behaviour, maintaining that all individuals strive to satisfy the three basic universal psychological needs for *autonomy*, *competence* and *relatedness* – essential for human growth, development, optimal motivation and functioning and psychological well-being.

Applied to the sport domain, satisfaction of the athletes' three basic needs by virtue of their sport milieu ought to result in higher levels of well-being. A particularly appealing quality of the concept of need satisfaction is that it allows for the identification of optimal conditions within the environment under which the three needs can be fulfilled and, in turn, successfully promote well-being (Reinboth & Duda, 2006). Following is a review of the definition of well-being, its operationalisation according to SDT and the antecedents of well-being in sport.

Well-Being

Whilst being conceptualised in several assorted ways, the complex construct of well-being is largely defined as a positive psychological state accompanied by optimal experience and functioning, as opposed to the absence of a negative psychological state dominated by obstructive cognitions and feelings (Reinboth & Duda, 2006; Quested & Duda, 2010). Caspersen, Powell and Merritt (1994) further define well-being as the subjective internal state of an individual – does the individual feel emotionally, mentally and physically healthy? The Constitution of the World Health Organization (1946) recognises the essence of psychological well-being by defining health as "a state of complete physical, mental, and social well-being not merely the absence of disease or infirmity".

Well-Being According to Self-Determination Theory

Contemporary research by Ryan and Deci (2001) has derived from the two perspectives of *hedonic* and *eudaimonic* well-being.

The first of the principle approaches to defining well-being, the hedonic view, refers to well-being as happiness, positive affect and pleasure attainment and the absence or avoidance of pain and displeasure. The main focus of the hedonic viewpoint is subjective well-being, and an important associated characteristic is that it can be a passive condition, not always consequently related to the quest and attainment of significant goals and purposes (Chatzisarantis & Hagger, 2007a).

The second approach, the eudaimonic perspective, focuses on self-realisation and the actualisation of human potential: the degree to which individuals have fulfilled their personal potential and are functioning optimally (Waterman, 1993). Eudemonia is manifested in feeling energetic and alive and having a sense of purpose in life and is not necessarily associated with accomplishing all the desires or outcomes an individual values (Ryan & Deci, 2001).

Giving rise to diverse research foci, these two perspectives and their body of knowledge are divergent in some areas and complementary in others. However, SDT (more specifically the BPNT) embraces and endorses the eudaimonic concept, as it is deemed of great consequence with respect to well-being in the long term, as well as optimal fulfilment (Chatzisarantis & Hagger, 2007b), and thus defines well-being as "optimal functioning and experience" (Ryan & Deci, 2001, p.142).

An area directly associated with physical activity is that of energy. A recent extension within the SDT theoretical framework is the emergence of a theory of subjective energy and its subsequent enhancement or depletion (Ryan & Deci, 2008). The classic definition of *vitality* is having physical and mental energy and "when vital, people experience a sense of enthusiasm, aliveness, and energy available to the self" (Ryan & Deci, 2008, p.703). Ryan and Deci (2008) add that associated feelings of subjective vitality include activated positive affect (Watson & Tellegen, 1985), calm energy (Thayer, 1996) and vigor (McNair, Lorr & Droppleman, 1971) and that these feelings are extraneous to other forms of activation and arousal per se (Ryan & Frederick, 1997). Vitality is an energy that can be channelled or regulated for purposive behaviour and also represents a dynamic facet of well-being, specifically that of eudaimonic well-being (Standage & Ryan, 2012).

Past and current models of energy focus predominantly on the constructive effects of vitality and the factors that lead to the draining, obstruction or hampering of energy. SDT, on the other hand, has shifted the focus to the equally important but less understood factors contributing to the enhancement and maintenance of energy (Ryan & Deci, 2008). This shift in focus was decided upon whilst conducting studies within the field of sport and exercise motivation, as vitality recurrently emerged as an indicated outcome of intrinsically motivated physical activities in a study done by Frederick and Ryan (1993). Additional evidence also

emerged intimating that similar activities could either catalyse or tap energy, depending on whether they were driven by volition or extrinsic motives (Standage & Ryan, 2012).

Thus, the SDT model of vitality was cultivated and structured around the following central hypotheses (Ryan & Deci, 2008). Firstly, more autonomously self-regulated behaviour and an internal locus of causality will result in the enhancement or maintenance of vitality, whilst activities coupled with a controlled form of regulation and an external locus of causality will be energy-draining. Secondly, activities that satisfy an individual's basic psychological needs for autonomy, competence and relatedness should provide psychological nutriments to the self and will thus manifest as preserved vitality or a boost in energy. Conversely, activities that thwart these basic psychological needs will obstruct or deplete one's available energy resources. The final hypothesis focuses on an individual's goals. Lifestyles directed at extrinsic goals will be associated with diminished vitality, whereas intrinsic life goals will result in an enhanced sense of vitality.

A study conducted by Gagné, Ryan and Bargmann (2003) with elite-level female gymnasts, over a period of several weeks, revealed that even though the gymnasts had engaged in physically gruelling activities, they reported increased ratings of energy, vitality and positive affect during the times when feelings of autonomy, competence and connectedness were present. Reinboth and Duda (2006) observed fluctuations in the subjective vitality of British university athletes, predicted by changes in the satisfaction of the athletes' basic psychological needs over the course of a competitive season. Further empirical support for the above-mentioned postulations, based on numerous methodologies and applicable at both within- and between-person levels of analysis, has emerged (e.g., Kasser & Ryan, 1999; Moller, Deci & Ryan, 2006; Muraven, Rosman & Gagné, 2007; Nix, Ryan, Manly & Deci, 1999; Reis, Sheldon, Gable, Roscoe & Ryan, 2000; Ryan, Bernstein & Brown, 2010; Vansteenkiste, et al, 2007). The emergence of this literature has multiple

ramifications, as vitality is not only critical to psychological and physical well-being but also to greater persistence and performance among sport participants. Vitality has been branded by SDT as an essential resource with a large assortment of benefits and, therefore, opportunities to support the autonomy, competence and relatedness needs of athletes, rather than controlling aspects of behaviour, should be utilised (Ryan & Deci, 2008).

As suggested by the CET, discussed earlier in the chapter, certain socio-environmental contexts may foster or hinder psychological need satisfaction and, in turn, motivation and well-being. The investigation of such contexts was thus deemed necessary in order to better comprehend the effects of motivation on well-being within the sport context. The two factors that have emerged as the focus of research in this area are the concepts of interpersonal approaches and motivational climate (Gagné & Blanchard, 2007).

Within the sporting environment, the coach is a significant figure, with the capacity to positively or negatively influence the psychological and physical health of athletes (Adie, Duda & Ntoumanis, 2008; Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2010). That is to say, if coaches support their athletes' basic psychological needs it significantly impacts the athletes' vitality, thereby enhancing their psychological well-being and positively affecting their performance. Thus, we will now direct the focus to SDT's notion of need-support in creating an optimally motivating environment for athletes in the sporting context (Ryan & Deci, 2007).

Need-Supportive Environments and Motivational Climate

The range and scope of means utilised to influence an individual's need satisfaction and motivation in sport are plentiful. However, research indicates that the general leadership style displayed by coaches plays a particularly influential and critical role in the motivation and behaviour of athletes (Adie, Duda & Ntoumanis, 2008; Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2009; Conroy & Coatsworth, 2007; Iachini, Amorose & Anderson-

butcher, 2010; Judge, Petersen & Lydum, 2009). Due to their significance, supervisory role and direct interactions with athletes, coaches are in an inimitable position to facilitate and impact the psychological and physical health, quality of engagement of an individual athlete or team of players, self-perceptions and experiences of their athletes, and create a broader motivational climate within the sporting context (Adie, Duda & Ntoumanis, 2008; Bartholomew, Ntoumanis & Thøgersen-Ntoumani, 2009; Coatsworth & Conroy, 2009; Iachini, Amorose & Anderson-butcher, 2010).

Sport scientists and researchers investigating SDT are under the general consensus that athletes are inclined to experience greater psychological need satisfaction and, thus, enhanced self-determination, when coaches take on a coaching orientation that is need-supportive (also referred to as autonomy-supportive), by engaging in behaviours that support rather than undercut the athletes' needs for autonomy, competence and relatedness (Almagro, Sáenz-López & Moreno, 2010; Edmunds, Ntoumanis & Duda, 2008; Smith, Ntoumanis & Duda, 2007). A need-supportive individual in a position of authority would behave in the following manner: acknowledging the thoughts and feelings of others; encouraging choice, self-regulation of others' behaviour and initiative; and minimising the use of controlling demands and pressure (Amorose, 2007; Deci & Ryan, 1987). Coach behaviours employed to control or coerce athletes risk potentially hindering the athletes' need satisfaction and thus undermining their self-determined motivation, resulting in several detrimental consequences to the well-being of the athlete (Bartholomew, et al., 2009; 2010). These controlling interpersonal styles are characterised by pressurising others to think, feel and behave in a manner consistent with the desires and wishes of the authority figure (Amorose, 2007; Bartholomew, et al., 2010). Regrettably, a more controlling interpersonal style is what several authority figures, including teachers and coaches, are inclined to rely on in their positions of leadership as there is the misperception that these behaviours are more effective (Castle,

2002). From a motivational perspective, however, controlling behaviour is deemed far less effective than being need-supportive (Hagger & Chatzisarantis, 2005; Mageau & Vallerand, 2003).

In response to the question as to how a coach would facilitate need-support, Mageau and Vallerand (2003) expanded on the practices that, when combined, represent a need-supportive leadership style. These coaching behaviours would include: (a) offering choice to their athletes within specific rules and boundaries; (b) providing athletes with significant rationales for tasks, activities, rules and limits; (c) enquiring about and acknowledging the athletes' feelings and perspectives; (d) providing the athletes with the opportunities to take initiative and act independently; (e) providing non-controlling feedback regarding the athletes' performance and competence on a task or skill; (f) avoiding controlling behaviours and statements, guilt-induced criticism and the use of tangible rewards; (g) precluding the promotion of ego involvement.

Considerable evidence attests to the positive facilitation of the afore-mentioned elements of need-support in obtaining optimal motivational outcomes and effective functioning, not only within sport but across an array of life domains (Baard, 2002; Deci & Ryan, 2008b; Pelletier, et al., 2001; Reeve & Halusic, 2009; Reeve, 2002; Vansteenkiste, Simons, Soenens & Lens, 2004).

At this point, it seems worthwhile to acknowledge that current research within coaching effectiveness concentrates by and large on each athlete's perception of the coach's behaviours, as opposed to focusing on the actual behaviour of the coach. In harmony with the assumptions of SDT, as well as other social-cognitive approaches to motivation, the athlete's interpretation, perception and evaluation of the coach's behaviour carries far more weight than the actual actions of the coach (Amorose, 2007; Horn, 2008). Following is an expansion

of the situational components that provide the necessary support for each of the basic needs as they may be applied within sport settings.

According to Amorose (2007), the following strategies and guidelines, consistent with theory and research, may be applied by the coach in enhancing an athlete's perception of autonomy, competence and relatedness.

Support for autonomy – Coaches may enhance the athletes' perception of autonomy through utilising various empirically supported techniques. (a) Provision of choice can be achieved by involving athletes in the setting of goals and decision-making processes and incorporating their needs, interests and ideas into relevant activities. (b) Assisting athletes in setting realistic goals and providing them with opportunities to display responsibility, serve as leaders and experience autonomy. (c) Aiding athletes in interpreting external rewards as informational (a result of personal mastery) as opposed to controlling. (d) Communicating with athletes in a way that is oriented toward skills and development rather than focusing on external outcomes, and being mindful of the use of guilt-inducing criticism and excessive pressure.

Support for competence – As mentioned before, a shared basic principle of both the cognitive evaluation theory and organismic integration theory is that the perception of competence is crucial for any intentional behaviour or act. Thus, without a sense of competence, an individual will be amotivated to perform. In order to enhance an athlete's perception of competence, it is recommended that (a) coaches encourage skill-building activities that hold meaning and interest for the athletes, within the training sessions, and that they provide support for creativity and create opportunities for success. (b) Engage athletes in clearly defined tasks and activities that are optimally challenging but suitable to their competencies. (c) Coaches should also supply the athletes with positive reinforcement for mastery and progress and provide appropriate, specific feedback related to the athletes'

endeavours, in a well-timed fashion. Within SDT, an essential component to the advancement of competence is the provision of structure (Markland, Ryan, Tobin & Rollnick, 2005; Standage, Gillison & Treasure, 2007; Standage & Ryan, 2012). Structure entails a consistent and predictable social context in which there is a clear understanding of the expectations and behaviour-outcome contingencies, as well as goal-setting and guidance for developing competencies and discipline. It is of utmost importance that structure not be confused with control, as assumed by many practitioners.

Support for relatedness – Coaches who assist their athletes in developing and maintaining positive relationships, and who avoid being judgemental and acknowledge the values, feelings and perspectives of athletes when making decisions, are more likely to cultivate a sense of relatedness amongst their athletes. Within SDT, the component of interpersonal involvement is defined as the degree to which significant others devote psychological resources such as energy, time and interest to the relationship and create opportunities for individuals to feel a sense of belonging or relatedness (Markland, Ryan, Tobin & Rollnick, 2005; Standage, Gillison & Treasure, 2007; Standage & Ryan, 2012). A solid, positive coach-athlete relationship formed on the basis of trust, respect and care is of great significance in the development of an athlete's sense of relatedness. In fact, the coach-athlete affiliation is depicted as paramount to the intrinsic motivation and ensuing performance of the athlete (Ahlberg, Mallett & Tinning, 2008).

Furthermore, several studies and sport literature have confirmed that an additional advantageous coaching strategy in the sport domain is to create or structure a more mastery (task-involving) motivational climate (McArdle & Duda, 2002; Petherick & Weigand, 2002; Sarrazin, Vallerand, Guillet, Pelletier & Cury, 2002; Taylor, Ntoumanis & Standage, 2008; Treasure, 2001). The motivational climate, a psychological concept and term introduced by Ames (1992), reflects the aspects of the social-psychological environment that influence

motivation. Ames proposed the motivational climate to be multi-dimensional, inclusive of different structures, such as the type of practice and learning experiences constructed by the coaches; the basis for recognition and the way feedback is communicated; the nature of group interactions; the system of evaluation and the sources of authority. By encouraging learning, development, a greater involvement with the task and effort as the keys to success, coaches initiate a task-involving (mastery) motivational climate, which will enable the promotion of adaptive athlete outcomes, including intrinsic motivation, perceived competence, behavioural engagement and psychological well-being (Amorose, 2007; Standage & Ryan, 2012; Taylor, Ntoumanis & Standage, 2008). This account falls in line with SDT, which posits that humans perform and develop efficiently as a consequence of the social environment and its prospect for basic need satisfaction (Adie, Duda & Ntoumanis, 2008). In addition, research conducted by Balaguer, Duda, Atienza and Mayo (2002) revealed a positive relation between a task-involved environment and perceptions of team improvement as far as the technical, tactical, physical and psychological aspects of the sport are concerned. On the contrary, an ego-involved (performance) motivational climate represents an environment characterised by social comparison, interpersonal competition and public evaluation, where the athlete's self-worth centres on winning and outperforming others (Amorose, 2007; Reinboth & Duda, 2006). Within this climate, the athletes who demonstrate a superior performance typically receive encouragement and rewards from the coaches, whilst punishment is dealt out to those athletes who err (Amorose, 2007). Participating under an ego-involved climate by and large leads to less positive achievement-related outcomes and less self-determined forms of motivation (Hodge & Lonsdale, 2011; McArdle & Duda, 2002; Standage & Ryan, 2012). Hence, the link between the motivational climate and athletes' motivational orientation is strongly supported by research and theory. A longitudinally based study by Reinboth and Duda (2006) found there to be an increase in the satisfaction of collegiate athletes' needs for

autonomy, competence and relatedness as they perceived their environment to be that of a coach-initiated mastery motivational climate. This, in turn, led to an increase in the athletes' perceptions of their vitality.

Horn (2008) provides a useful summary of the coaching behaviours and styles consistently found to be facilitative or detrimental to athletes' psychosocial growth and development, displayed in Table 2.

Table 2

Facilitative Coaching Styles or Behaviours Versus Detrimental Coaching Styles or Behaviours (Horn, 2008, p. 264)

Facilitative coaching styles or behaviours	**Detrimental coaching styles or behaviours**
High frequency of training and instructional behaviour	Ignoring athletes' skill errors
High level of social support and positive feedback	High frequency of punishment-oriented feedback (especially feedback not accompanied by skill-relevant information
Democratic or autonomy-supportive leadership style	Autocratic or controlling leadership style
Creation of a mastery-oriented (task-involving) motivational climate	Creation of a performance-oriented (ego-involving) motivational climate
Provision of positive, supportive and informationally based feedback in response to athletes' performance successes and failures	Failure to recognise or respond to athletes' performance successes

Horn (2008) further maintains that the experiences of individual athletes within sport contexts are likely affected by gender, race, social class and other diversity characteristics. As Gill (2004) stated, "We can only make important contributions to the real world of developing sport and exercise participants when we incorporate gender and cultural analyses" (p.497). Thus, a thorough scrutiny of the coach-athlete relationship, as it pertains to race and gender or social class, should be conducted. This postulation leads to the next section.

Need Satisfaction, Motivation and Well-Being Across Gender, Culture and Age

Taking into account the preceding literature and the recognition it holds for the invariant function of basic need satisfaction in sustaining motivation and promoting well-being within the sport and other multiple domains, there is significance in clarifying and reiterating the concept of needs as applied within SDT. The psychological needs for autonomy, competence and relatedness are considered to be basic, innate and specifically defined as "nutriments essential to growth, integrity, and well-being" (Ryan & Deci, 2007, p. 13). More specifically, SDT assumes these needs to be universal and cross-developmental and thus the relationship between need fulfilment, motivation and psychological health is expected to be evident in all individuals across genders, ages and cultures, although the means through which these needs are satisfied will differ as a function of gender, age and culture (Ryan & Deci, 2002). This postulate is supported by subsequent research in a variety of countries (e.g., Adie, Duda & Ntoumanis, 2008; Deci & Ryan, 2008a; Hagger & Chatzisarantis, 2007; McDonough & Crocker, 2007). The empirical focus of SDT is on the consequential individual differences in the varying degrees to which the basic needs are fulfilled or thwarted, rather than concentrating on the individual differences in need strength as, whilst still acknowledging the immense variation associated with need strength, it is still deemed less important (Deci & Ryan, 2000; 2008a). The cross-cultural generalisability of SDT seems to be an especially controversial topic. The view of SDT on cultural differences suggests that, although an individual's culture may be influential in a profound and significant way, including the means by which individual needs are satisfied, the fact that each individual requires a satisfaction of needs in order to experience optimal functioning and well-being is not culture-dependent (Deci & Ryan, 2008b). This cross-cultural hypothesis has been actively tested and numerous studies, involving both the Western and Eastern cultures, have found basic need satisfaction to promote psychological well-being (Chirkov, Ryan, Kim

& Kaplan, 2003; Ryan, et al., 1999; Ryan, La Guardia, Solky-Butzel, Chirkov & Kim, 2005). This substantial body of growing research within SDT clearly suggests that at the core of all males, females and cultures (collectivistic or individualistic), regardless of apparent cultural and gender differences in values and practices, are the basic and universal needs to attain optimal motivation, well-being and performance (Deci & Ryan, 2008b; Ryan & Deci, 2002).

It is therefore apparent that, regardless of an athlete's gender, culture or developmental phase, if a coach creates a motivational climate in which the athletes' perceived satisfaction of the three basic needs of autonomy, competence and relatedness are promoted, an adaptive environment conducive to enhancing quality sport participation and reaching optimal performance can be developed.

Summary and Conclusion

SDT has received extensive support from studies and research conducted within the sport setting. In harmony with SDT, sport literature has established there to be a consistent relation between the promotion of self-determined forms of motivation and positive cognitive, affective and behavioural outcomes, including an increase in the athletes' level of performance. Furthermore, the tenets of SDT have facilitated our understanding of the antecedents of psychological well-being with higher levels of self-determination shown to lead to increased vitality, more positive affect, satisfaction and good sporting behaviour amongst athletes. In addition, the environmental factors such as the perceived leadership styles exhibited by coaches, the motivational climate, and mediators like the basic psychological needs significantly impact the athletes' motivational orientation and psychological outcomes. Regardless of gender and cultural difference, SDT believes that a truly self-determined motivational profile exists and that this profile should indeed result in the most positive effect. Thus, it is crucial for researchers to formulate an understanding of which behaviours render positive experiences and performance on the part of the athletes.

The considerable support that SDT has received across multiple achievement contexts suggests that the basic principles of this theory can be utilised to advance the self-determined motivation, positive development and well-being of athletes in a very hands-on manner. In the words of Kurt Lewin (as cited in Amorose, 2007), "There is nothing so practical as a good theory" (p. 224).

"To be self determined is to endorse one's actions at the highest level of reflection. When self determined, people experience a sense of freedom to do what is interesting, personally important, and vitalizing."

(Edward Deci & Richard Ryan)

Conceptualisation of Proposed Model

Guided by the self-determination theory as a framework extensively used to study the cognitive, affective and behavioural consequences of the quality of motivation experienced by athletes in a sport setting, the following model of sport performance is proposed. Firstly, the athletes' perceptions of the coaches' behaviour and leadership style, in the form of need-supportive leadership, should positively influence the athletes' self-determined sport motivation. In turn, the athletes' quality of (self-determined / autonomous) motivation experienced will have important implications for their psychological well-being, as indicated by subjective vitality and positive affect. Furthermore, this perceived need-supportive leadership style is also expected to have a direct beneficial impact on the level of psychological well-being experienced by the athletes. An exploratory stance will be taken with respect to the relation between perceived need-supportive leadership and the poorer quality (controlled) motivation variable. Controlled motivation is further expected to have a negative influence on the athletes' psychological well-being. Finally, it is anticipated that the

athletes' quality of motivation and psychological well-being will both be related to the performance displayed by the athletes.

By incorporating the athletes' perception of need-supportive leadership, the motivation and psychological well-being experienced, and the sport performance, it is believed that the model proposed will allow for a better understanding of the determinants of athletes' performance and guide the way to successfully facilitating sport performance.

CHAPTER FOUR

Methodology

The main aim of this study was to investigate the statistical effect of perceived need-supportive leadership on types of motivation, psychological and emotional well-being and performance levels among top adolescent sport achievers in South Africa. This relationship was then further investigated across the variables of gender and race.

In this chapter, the research methodology employed in this study is described. Firstly, the research design utilised is illustrated and, secondly, a framework of the sampling design is discussed. This is followed by the presentation of the descriptive statistics for the research participants and a detailed portrayal of the data-collection procedures, ethical considerations and the psychometric properties of the measuring instruments utilised. Finally, a statement of the specific research questions and the statistical procedures selected to investigate them will conclude the chapter.

Research Design

A non-experimental, cross-sectional survey research design utilising self-report measures was selected to investigate the various factors at hand. Self-report survey designs are the most frequently used research designs within the social and behavioural sciences, as they are flexible and prove to be both time and cost efficient in the collection of data (Babbie & Mouton, 2010; Huysamen, 2001). This design was selected due to it being a practical and feasible source for measuring the attitudes, orientations and characteristics of a larger sample of participants. Self-report survey studies do, however, have certain disadvantages. These shortcomings include the possibility of significant response bias; minimal control over extraneous variables and sources of error, such as common method biases; and the fact that survey studies cannot always deal with the context of the phenomenon being studied (Babbie & Mouton, 2010; Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Whilst remaining fully aware of these issues, a concerted effort was made to select self-report measures that had been shown to be reliable and valid.

Whilst a survey study offers an overview of the study in question, it lacks the capacity to assess the theoretical models developed. Statistical modelling is therefore applied to the data gathered in the survey studies, in order to surmount this shortcoming. Theory development, as the central aim of scientific research, is supported by statistical modelling studies as it evaluates and validates a theoretical model of the phenomenon being considered. (Kaplan, 2009; Mouton, 2001).

Sampling Design

The focus of this research was to investigate the statistical effect of need-supportive leadership on the motivation, psychological well-being and performance of top-achieving adolescent team-sport athletes. The sampling procedure followed was multi-stage sampling. Due to the focus of the study being on team-sport athletes, as opposed to individual athletes, four mainstream team sports played in South Africa at school level were identified, namely soccer and rugby for boys; and hockey and netball for girls. Subsequently, South Africa's five top sporting provinces were identified, namely Eastern Cape; Free State; Gauteng; KwaZulu-Natal and Western Cape (Sport and Recreation South Africa, 2005). The national chairpersons for each of the four selected team sports were then consulted to identify the three top-performing schools within the first national league for each sport, within each of the identified provinces. A simple random sampling method was used in selecting one school from the top three ranked schools within each prescribed team sport, per province, that would ultimately be approached for participation. These top ranked schools (of which two are private and 23 government-funded) included 21 urban and four rural schools. The first- and second-team squads as well as the respective coaches from each of the identified schools were recruited and included in the study. The soccer and rugby players represented the male sample (N=254), while hockey and netball players constituted the female sample (N=199).

As the original sample size of black females (N=11) proved to be disproportionately smaller than the other three sample sizes (white male; black male and white female), a supplementary stage of the sampling procedure, a non-probability purposive/judgemental sampling design was employed, directed specifically at top black sportswomen. Thus, additional top-ranked schools, with the highest representation of black sportswomen, within the first national team sports leagues of each identified province, were approached for this purpose. A further 38 black female athletes and 7 coaches were recruited. A total of 33 coaches, comprising both genders and both black and white racial groups, partook in this study.

To summarise, the total sample consisted of 453 team-sport athletes, recruited from the four athletic teams (mean age = 17.3 years), and 33 coaches. The athletes comprised both genders, male (mean age = 17.5 years) and female (mean age = 17.1 years) and two main racial groups, black (mean age = 17.1 years) and white (mean age = 17.4 years). The coaches were representative of both genders and both black and white racial groups.

Tables 3 presents the distribution of athletes according to the demographic variables previously mentioned.

Table 3

Frequency Distribution of Athletes According to Gender and Race

	Male	**Female**	**Total**
White	117 (26%)	150 (33%)	267 (59%)
Black	137 (30%)	49 (11%)	186 (41%)
Total	254 (56%)	199 (44%)	453 (100%)

From Table 3 it can be seen that the sample of athletes was reasonably evenly distributed in terms of gender with slightly more males (56%) than females (44%) being included and white (59%) being the predominant race. Furthermore, the majority of the

athletes in the sample were white females (33%), whilst black females (11%) constituted the minority of the sample.

Table 4 presents the distribution of coaches according to gender and race.

Table 4

Frequency Distribution of Coaches According to Gender and Race

	Male	**Female**	**Total**
White	9 (27%)	18 (55%)	27 (82%)
Black	6 (18%)	0 (0%)	6 (18%)
Total	15 (45%)	18 (55%)	33 (100%)

From Table 4 it is evident that there was a reasonably even distribution as far as gender was concerned (males = 45% and females = 55%), however, white was the predominant race at 82%.

Information regarding the collection of data and the characteristics of the standardised questionnaires used in this study are presented in the following section.

Data Collection Procedures & Ethical Considerations

Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered Under the Health Professions Act (Act no.56 of 1974) (Department of Health, 2006) requires that the researcher obtains institutional permission from the host organisation / institution. An institutional approval to conduct the study was granted by the University of the Free State, South Africa, and permission was obtained from the Department of Education in the Free State, Western Cape, Eastern Cape, Gauteng and KwaZulu-Natal. Furthermore, consent for the implementation of the study was received from the principals of the selected schools. Coaches of the teams that agreed to partake were sent correspondence describing the study and its purpose. The present study further met the requirements according to Annexure 12 (Department of Health, 2006), as the research aim and procedure were explained to the

athletes concerned, in order to obtain their informed consent for participation. It was emphasised that participation in the study was voluntary and withdrawal, at any point, would not result in any penalties or negative consequences. No athletes declined to participate. This phenomenon can best be explained by the fact that this research was supported by the participating coaches and the athletes were adequately motivated with respect to the necessity of this study for the advancement and development of the sporting field within South Africa. For measurement purposes, athletes and coaches were asked to identify themselves on the questionnaires but were assured that their responses would remain confidential. The administering of the questionnaire, with both athletes and coaches, took place before or after routine team training sessions. Instructions for completing the various sections were provided by the researcher and it was emphasised that participants should complete the sections as candidly and self-directed as possible. It was also highlighted that there were no correct or incorrect answers, responses would be regarded as confidential, and no coach would have access to any athlete's questionnaire. Approximately 30 minutes were required for completion and, once concluded, the questionnaires were handed back to the investigator. The multi-section self-report form for the athletes included (a) biographical information (gender, race, age and sport practiced); (b) coaching style (perceived need-support); (c) motivation for participating in sport; (d) well-being variables; and (e) performance measures. The coaches received a rating scale, with the purpose of rating each athlete's development and performance on five varying levels, namely *technical*; *tactical*; *physical*; *psychological;* and *overall development and performance.* No answer booklets were deemed invalid.

Measuring Instruments

In this section, the athlete measures are described, followed by a description of the rating scales distributed to the coaches. The athlete questionnaires are included in Appendix

A, and the coach questionnaires are provided in Appendix B. A summary of the descriptive statistics and alpha coefficients of the constructs is provided after each subsection.

Coaching Style (Perceived Need-Supportive Leadership Construct)

Goris (2006) compiled a questionnaire with adapted items from the following measures: Perceptions of Parents Scale (POPS: Grolnick, Ryan & Deci, 1991) (e.g. *My coach is often willing to see things from my point of view*); Children's Report of Parental Behaviour Inventory (CRPBI: Schaefer, 1965) (e.g. *My coach makes me feel better about myself after discussing my problems with him/her*); Teacher as Social Context Scale (Belmont, Skinner, Wellborn, & Connell, 1988) (e.g. *I clearly understand what my coach expects of me*); as well as additional items with the purpose of measuring each athlete's perceived level of *Autonomy Support*, *Competence Support* and *Social Support* received from the coach. The mentioned instruments were all adapted to the sporting context. A measure of the athletes' perception of the need-support provided by the coach was obtained by the administration of this coaching-style questionnaire (e.g. *When possible, my coach allows me to choose what I would like to do*), measured by a five-point Likert scale, anchored by *not at all true* (1) to *very true* (5).

The internal reliability of this instrument was found to be satisfactory for a group of Belgian sporting youth, with alpha coefficients ranging between 0.72 and 0.75. The current study found the alpha-coefficients for the subscales to range from 0.79 to 0.81.

Table 5

Descriptive Statistics and Alpha Coefficients for the Perceived Coaching-Style Construct

Scale	**α**	***Range***	***M***	***SD***	***N* Items**
Autonomy Support	.80	1 - 5	3.48	0.52	12
Competence Support	.79	1 - 5	3.76	0.56	9
Social Support	.81	1 - 5	3.49	0.67	7

Participation Motivation (Motivation Construct)

The Sport Motivation Scale (SMS: Pelletier, et al., 1995) was used to measure each athlete's motivation for participating in their specific sport. The scale consists of seven subscales, measuring three types of intrinsic motivation (IM), i.e. intrinsically motivated to know (e.g. *for the pleasure of discovering new training techniques*), intrinsically motivated to accomplish (e.g. *because I feel a lot of personal satisfaction while mastering certain difficult training techniques*), intrinsically motivated to experience stimulation (e.g. *because I like the feeling of being totally immersed in the activity)*; three forms of regulation for extrinsic motivation (EM), i.e. identification (e.g. *because it is a good way to learn lots of things which could be useful to me in other areas of my life),* introjection (e.g. *because I would feel bad if I were not taking time to do it)* and external regulation (e.g. *for the prestige of being an athlete)*; and amotivation (e.g. *I don't know anymore; I have the impression that I am incapable of succeeding in this sport).* In accordance with the posited distinction between autonomous motivation and controlled motivation within SDT literature (Deci & Ryan, 2008a; 2008b), the intrinsic motivation and identified regulation subscales were combined to provide a composite score for autonomous motivation. Similarly, a score for controlled motivation was created by combining the introjected regulation and external regulation subscales. For the purpose of this study only these two composite scores were utilised. Using a seven-point Likert scale, athletes indicated to what extent each of the measurements' statements corresponded to one of the reasons why they were presently practicing their sport, ranging from *does not correspond at all* (1) to *corresponds exactly* (7).

A study using the original French version of the scale, involving 520 French-Canadian athletes recruited from various athletic teams (basketball, volleyball, football, handball, soccer, badminton, ice hockey and swimming) with a mean age of 18.4 years, revealed satisfactory internal consistency levels with a mean alpha-coefficient of 0.82 (Brière,

Vallerand, Blais & Pelletier, 1995). Once translated into English, a study was conducted with 593 university athletes (mean age of 19.2 years) in Ontario, Canada from various athletic teams (basketball, volleyball, football, rugby, soccer, ice hockey, track and field, cross-country running and swimming). The internal consistency revealed a mean alpha-coefficient of 0.75, a slightly lower value than that obtained with the original version of the scale. However, despite the overall consideration that each subscale consists of only four items, the levels of internal consistency appear to be adequate (Pelletier, et al., 1995). For the current study, the alpha-coefficients for each primary dimension were found to be satisfactory at 0.87 and 0.77 for autonomous and controlled motivation respectively.

Table 6

Descriptive Statistics and Alpha Coefficients for the Motivation Construct

Scale	**A**	***Range***	***M***	***SD***	***N* Items**
Autonomous Motivation	.87	1 - 7	5.33	0.81	16
Intrinsic Motivation	.85	1 - 7	5.37	0.84	12
Identified Regulation	.64	1 - 7	5.22	1.04	4
Controlled Motivation	.77	1 - 7	4.36	1.16	8
Introjected Regulation	.67	1 - 7	4.58	1.32	4
External Regulation	.61	1 - 7	4.14	1.27	4

Well-Being Variables

As the focus of the current study was the statistical effect of well-being on the performance of the athletes, a psychological well-being scale consisting of two subscales, namely subjective vitality (seven items) and positive affect (ten items), was compiled.

Subjective vitality was operationalised by utilising the seven-item version of the Subjective Vitality Scale (Ryan & Frederick, 1997) which measures to what extent the athletes felt energised and mentally invigorated whilst participating in their sport during the past few weeks (e.g. *During the past few weeks I have felt alive and vital while participating*

in my specific sport). Responses were indicated on a five-point Likert scale anchored by *not at all true* (1) and *very true* (5). An internal consistency of 0.91 was found for this instrument in a study conducted with 337 Greek athletes, practising an assortment of team sports at varying participation levels (Mouratidis, Lens & Vansteenkiste, 2010). For the current study, a satisfactory alpha-coefficient of 0.80 was found.

Utilising the twenty-item Positive Affect and Negative Affect Schedule (PANAS*;* Watson, Clark & Tellegen, 1988), the positive affect of the athletes was gauged by the ten self-rated positive-affect items. A five-point Likert scale (1 = *very slightly or not at all*; 5 = *extremely*) was used to indicate to what extent the athlete experienced specific positive emotions (e.g. *enthusiastic, interested* and *confident*) during the past few weeks.

Based on data collected from a group of undergraduate students at Southern Methodist University in Dallas, Texas over a variety of rated time frames, the internal consistency reliabilities are high, with the alpha-coefficient ranging from 0.87 to 0.89 for positive affect (Watson & Clark, 1999). The internal consistency reliability found for positive affect in the current study was ($\alpha = 0.82$).

Table 7

Descriptive Statistics and Alpha Coefficients for the Well-Being Construct

Scale	**α**	***Range***	***M***	***SD***	***N* Items**
Subjective Vitality	.80	1 - 5	3.56	0.65	7
Positive Affect	.82	1 - 5	3.58	0.66	10

Performance Variable

Due to the fact that a dearth of research exists with respect to this outcome variable (sporting performance), it is important to give a clear exposition of the stance taken in conceptualising this variable in the current study.

This variable was conceptualised as the combination of a developmental and a comparative performance rating. Both ratings were completed by each individual athlete (*self-rating*) and his/her coach (*coach-rating*).

Self-rating: The development and performance of each athlete was operationalised via a numerical rating scale compiled by the researcher, based on the following literature: Baker, Horton, Robertson-Wilson and Wall, 2003; Elferink-Gemser, Visscher, Richart and Lemmink, 2005; Janson, Archer and Norlander, 2003; Sands and McNeal, 2000. Athletes were required, firstly, to rate their own development over the past season according to the following five components: *technical level; tactical level; physical level; psychological level* and *overall development* and, secondly, to evaluate their own perceived *overall performance* (single score) in comparison with the other athletes within their team. A scale with the following five rank-ordered criteria was used in the rating of their development: *no development* (1); *poor development* (2); *average development* (3); *above average development* (4) and *excellent development* (5). The rating scale for the performance of each athlete ranged from *much weaker performance* (1) to *much stronger performance* (5).

An alpha-coefficient of 0.75 was found for this measurement in the current study.

Coach-rating: The development and performance of each athlete as rated by the team coach was operationalised via the same numerical rating scales administered to the athletes, adapted to the coaching context.

In the current study an alpha-coefficient of 0.91 was found for this measurement.

Table 8

Descriptive Statistics and Alpha Coefficients for the Performance Construct

Scale	***α***	***Range***	***M***	***SD***	***N* Items**
Development & Performance (self-rating)	.75	1 - 5	3.81	0.54	6
Development & Performance (coach-rating)	.91	1 - 5	3.67	0.73	6

A composite score for the performance variable was determined by summating the self-rating (individual) and coach-rating scores.

Following, the specific research questions and the statistical procedures selected to investigate them are addressed.

Research Questions

Relationships between perceived need-supportive leadership, motivational, psychological and emotional factors and performance levels were investigated for top adolescent team-sport achievers across gender and race.

Research Question One

Research question one involved exploring the relationships between perceived need-supportive leadership and athletes' motivation, psychological well-being and performance. The following hypotheses were formulated in this regard.

H_{1a}: A statistically significant positive relation exists between perceived need-supportive leadership and the autonomous (self-determined) motivation of top adolescent team-sport achievers in South Africa.

H_{1b}: A statistically significant negative relation exists between perceived need-supportive leadership and the controlled (non-self-determined) motivation of top adolescent team-sport achievers in South Africa.

H_{1c}: A statistically significant positive relation exists between perceived need-supportive leadership and the psychological well-being of top adolescent team-sport achievers in South Africa.

H_{1d}: A statistically significant positive relation exists between perceived need-supportive leadership and the performance of top adolescent team-sport achievers in South Africa.

Although research question one solely tested the direct relationships between the perceived coaching style and the dependent variables of autonomous motivation, controlled motivation, psychological well-being and performance, relevant theory seems to suggest that a more comprehensive exploration of additional relationships and paths should be considered.

Research Question Two

Research question two investigated whether the theoretical model could provide statistically significant support for the prediction that the athletes' perceived need-supportive leadership of the coach lead to enhanced motivation, psychological well-being and heightened performance.

H_2: Statistically significant path coefficients exist which support that performance can be predicted by the perceived need-supportive leadership, motivation and psychological well-being of top adolescent team-sport achievers in South Africa.

Research Question Three

Research question three investigated the meaningful differences with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and the performance variables across gender and race.

Statistical Techniques

The statistical analysis of the data was performed by means of quantitative techniques, with the following software programs: The Statistical Package for the Social Sciences Version 20.0 (SPSS Inc., 2011) and SmartPLS (Ringle, Wende & Will, 2005). The following analyses were conducted:

- Descriptive statistics
- Reliability analyses
- Confirmatory factor analyses
- Correlational analyses
- Structural equation modelling

Descriptive Statistics and Reliability Analyses

For evidence of these analyses, refer to Tables 5; 6; 7 and 8 in the current chapter. From the information presented in the above-mentioned tables, it can be concluded that the internal consistencies of the scales utilised display sufficient to high reliability coefficients (above the accepted 0.70), suggesting that they were thus appropriate measuring instruments for the study.

Confirmatory Factor Analysis

Confirmatory factor analysis enables the testing of the extent to which the measured variables represent the constructs and is utilised in providing a confirmatory test of the specific measurement theory (Hair, Black, Balbin, Anderson & Tatham, 2006).

In order to evaluate the quality of the measurements with regards to the data obtained, a confirmatory factor analysis (CFA) was conducted. Following is an explanation of the most widely used and reported fit statistics, also utilised in the current study (Byrne, 1998; Hair, Black, Balbin, Anderson & Tatham, 2006).

a) *Satorra-Bentler scaled chi-square (S-B X^2)* – The Satorra-Bentler scaled chi-square is utilised when robust estimation techniques are employed (when data deviates from the normal distribution). Should the data depart markedly from multivariate normality, the S-B X^2 is used in providing an improved estimate of the fit of a model (Satorra & Bentler, 2001).

b) *Standardised root mean residual (SRMR)* – The SRMR is the standardised square root of the mean of the squared residuals (i.e. an average of the residuals between individual observed and estimated covariance and variance terms). The lower the SRMR values, the better the fit, with the average SRMR value being 0 (implying

that both positive and negative residuals can occur) (Hair, Black, Balbin, Anderson & Tatham, 2006).

c) *The root mean square error of approximation (RMSEA)* – The RMSEA signifies how well the model fits the population and not just the sample used for estimation. Lower RMSEA values are indicative of a better fit and, as with SRMR, values below 0.10 indicate an acceptable fit and values below 0.05 suggest a very good fit (Hair, Black, Balbin, Anderson & Tatham, 2006).

d) *Comparative fit index (CFI) and Normed fit index (NFI)* – The general guideline for interpreting CFI and NFI suggests that values of 0.90 and higher are indicative of a satisfactory fit between the postulated model and empirical data (Hair, Black, Balbin, Anderson & Tatham, 2006).

Evidence of the above-mentioned fit statistics, as related to the current study, are provided in Table 11, Chapter Five.

Determining the Degree of Relationships Between Variables

In determining whether statistically significant relationships exist among the measured constructs, a largely pertinent data-analysis technique was employed: bivariate *r* (Bless & Higson-Smith, 2000; Field, 2009; Hair, Black, Balbin, Anderson & Tatham, 2006; Kerlinger & Lee, 2000).

The correlation (bivariate *r*). A standardised measure of the strength of the relationship between variables is the Pearson product-moment correlation coefficient. Taking any value from -1 (as one variable changes, the other changes by the same amount in the opposite direction), through 0 (as one variable changes, the other remains constant), to +1 (as one variable changes, the other changes by the same amount in the same direction) (Field, 2009).

Although a correlation is found to be statistically significant, the context of its associated strength and value to the investigation, however, requires assessment. Guilford (cited in Tredoux & Durrheim, 2002) offers a valuable reference in interpreting the strength of the identified correlation in statistically significant relationships among variables. Guilford's informal interpretations of the magnitude of *r* are tabulated next in Table 9.

Table 9

Guilford's Informal Interpretations of the Magnitude of r

Value of r (+ or -)	**Informal interpretation**
< 0.2	Slight; almost no relationship
0.2 – 0.4	Low correlation; definite but small relationship
0.4 – 0.7	Moderate correlation; substantial relationship
0.7 – 0.9	High correlation; strong relationship
0.9 – 1.0	Very high correlation; very dependable relationship

Following is an explanation of structural equation modelling (SEM) and, more specifically, the partial least squares path modelling approach utilised in this study.

Structural Equation Modelling (SEM)

Structural equation modelling (SEM) is a general term used in describing a variety of statistical models utilised in evaluating the consistency of substantive theories with empirical data and can be used to explore the relationship between latent constructs, indicated by multiple measures (Salkind, 2007). According to Marsh (2007), sport researchers should make confirmatory factor analysis (as previously discussed) and structural equation modelling the methodology of choice, due to their substantial flexibility for tackling intricate tangible issues in sport psychology.

The first approach to SEM, known as covariance-based SEM (hard modelling), emphasises the analysis of a theory. The second approach, known as variance-based (soft modelling), is an approach with the purpose of prediction (e.g. partial least squares modelling) (Henseler, Ringle & Sinkovics, 2009). In evaluating the structural model of this

study, the variance-based (soft modelling) approach, involving the use of Partial Least Squares (PLS), was employed. The rationale for using the PLS approach to SEM is highlighted below.

Motivation for using PLS modelling. The two most significant purposes of PLS modelling are *exploration* (testing and validating exploratory models within the early stages of theory development) and *prediction* (suitable for prediction-oriented research, assisting researchers in focusing on the explanation of endogenous constructs) (Henseler, et al., 2009).

Methodological characteristics of PLS modelling. PLS modelling is rooted in these authentic characteristics:

(1) When sample sizes are small, PLS can be used to estimate path models (Chin & Newsted, 1999).

(2) PLS path models can be very complex, in that they consist of numerous latent and manifest variables, without leading to estimation problems (Wold, 1985).

(3) PLS path modelling can be utilised when distributions are highly skewed (Bagozzi, 1994) or the independence of observations is not assured (Fornell, 1982).

Evaluating the structural component of SEM through PLS modelling. PLS models are formally defined by two sets of linear equations (Henseler, et al., 2009):

- The outer model (measurement model) – specifying the relationships between observed or manifest variables and latent variables.
- The inner model (structural model) – specifying the relationships between latent or unobserved variables.

According to Henseler, et al., (2009), PLS path modelling does not provide for any global goodness-of-fit criterion. Thus, Chin (1998) consequently proposed criteria for

assessing partial model structures by means of a systematic application, consisting of a two-step process, as outlined in Figure 2.

The first step is to assess the outer (measurement) model by focusing on the measurement reliability and validity according to the specific criteria associated with formative and reflective outer models. An estimate for the reliability, based on the indicator intercorrelations, is provided by the internal consistency reliability criterion, Cronbach's α. However, Werts, Linn and Jöreskog (1974) introduced the composite reliability measure, as Cronbach's α severely underestimated the internal consistency reliability of latent variables in PLS path models. Although interpreted in a similar manner to Cronbach's α, the composite reliability measure considers the fact that indicators have different loadings. Numerical evaluations of 0.7 and above, for the internal consistency reliability in early stages of research, are regarded as satisfactory, whilst 0.8 or 0.9 in further advanced stages of research are deemed sufficient (Nunnally & Bernstein, 1994). It is, however, indicated that a value below 0.6 is regarded as a lack of reliability (Henseler, et al., 2009). A significant criterion of convergent validity is the average variance extracted (AVE). This implies that more than half of the variance of its indicators on average can be explained by a latent variable (Fornell & Larcker, 1981; Henseler et al., 2009). A satisfactory convergent validity is indicated by an AVE value of at least 0.5. Furthermore, the R^2 values of 0.67; 0.33; or 0.19 for endogenous variables in PLS path models are described by Chin (1998) as substantial; moderate; and weak, respectively.

Secondly, the inner (structural) path model estimates can only be evaluated once the latent variable scores of the measurement model show evidence of sufficient reliability and validity. A schematic representation of the two-step process of PLS path model assessment is provided in Figure 2.

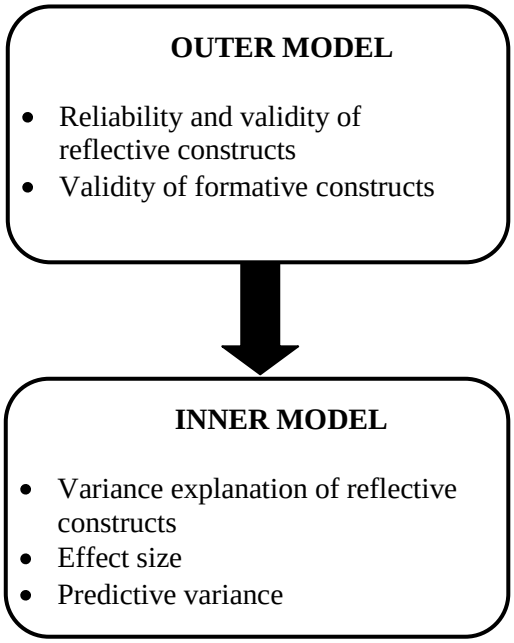

Figure 2. A two-step process of PLS path model assessment

In evaluating the structural model of this study, the three perceived need-support subscales were defined by an overall perceived need-support (coaching style) latent factor with autonomy, competence and relatedness scores as indicators. The decision to include all three of the needs in the same step was substantiated by Edmunds, Ntoumanis and Duda (2006), who stated that it makes theoretical sense to not examine each need independently, given that SDT assumes the three psychological needs to coexist. Similarly, a well-being latent factor was constructed with vitality and positive affect as indicators, whilst intrinsic motivation and identified regulation were used as indicators for the autonomous motivation latent factor and introjected regulation and external regulation were used as indicators for the controlled motivation latent factor. Finally, self-rating and coach-rating served as indicators for the latent factor of performance.

Executing a PLS-SEM multigroup analysis (PLS-MGA). PLS-MGA refers to a collection of techniques developed for comparing PLS-SEM model estimates (usually path coefficients) across two or more groups of data, in order to determine whether significant

differences between the coefficients exist (Hair, Hult, Ringle & Sarstedt, 2013). In exploring the significant differences between the path coefficients in the structural models of two groups, following the examination of the results of Levene's test, the appropriate selection of the parametric test statistic is dependent on whether the standard errors can be assumed to be equal or unequal in the population. If the standard errors are equal, a parametric test is computed. If the standard errors are unequal, a non-parametric test will be used.

Table 10

Summary of Statistical Techniques Implemented to Reach the Research Objectives

Research Question	**Statistical Technique**
H_1: Statistically significant relations exist between the predictor variable of perceived need-supportive leadership and the criterion variables of motivation, psychological well-being and the performance of top adolescent team-sport achievers in South Africa.	• Pearson-product-moment correlation (bivariate *r*)
H_2: Statistically significant path coefficients exist which support that performance can be predicted by the perceived need-supportive leadership, autonomous motivation and psychological well-being of top adolescent team-sport achievers in South Africa.	• Variance-based partial least squares modelling (PLS)
Research Question Three: Investigating the meaningful differences with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and performance variables across gender and race.	• Partial least squares – structural equation modelling multigroup analysis (PLS-MGA)

Summary

This chapter provided a portrayal of the methodology employed in the present non-experimental cross-sectional survey and statistical-modelling research study. The central aim of the study was to investigate the statistical effect of perceived need-supportive leadership on the types of motivation, psychological well-being and performance levels of top adolescent team-sport achievers in South Africa, with a second aim being to explore the nature of the relationships between the variables of gender and race. The sampling design, data-collection procedure and ethical considerations were discussed and the measuring instruments used were described in detail. The distribution of the sample of athletes (N = 453) in terms of the demographic variables of gender and race were provided. A statement of the three research questions and the statistical analyses selected to answer them was presented and, finally, the chapter concluded with support for the use of structural equation modelling and in particular partial least squares path modelling in evaluating the theoretical model depicting the relationships between the variables investigated in this study.

The next chapter provides statistical evidence of the confirmatory factor analysis and presents detailed results of the statistical analyses for each research question.

CHAPTER FIVE

Results

Chapter Five deals with the quantitative analysis of the data collected in order to answer the research questions outlined in Chapter Four. Following the statistical evidence of the confirmatory factor analysis, the current chapter is divided into three sections, each corresponding to a specific research question. As mentioned in Chapter Four, the statistical analysis of the data was performed using the following software programs: The Statistical Package for the Social Sciences Version 20.0 (SPSS Inc., 2011) and SmartPLS (Ringle, Wende & Will, 2005).

Results of Statistical Analyses

Confirmatory Factor Analyses

In order to evaluate the quality of the measurements with regards to the data obtained, five confirmatory factor analyses (CFA) were conducted. Confirmation of the conceptualisation of the constructs, as discussed in Chapter Four, are provided in the following Table 11. This table reports the goodness-of-fit indices associated with each identified construct.

Table 11

Goodness-of-Fit Indices for the Constructs

Construct	***df***	**S-B X^2**	**SRMR**	**RMSEA**	**CFI**	***p*-value**
Coaching Style	347	700.37	0.050	0.047 (0.042; 0.053)	0.97	0.00000
Autonomous Motivation	103	273.13	0.054	0.060 (0.052; 0.069)	0.97	0.00000
Controlled Motivation	19	97.59	0.066	0.096 (0.077; 0.11)	0.93	0.00000
Well-being	118	328.66	0.057	0.063 (0.055; 0.071)	0.96	0.00000
Performance	53	108.01	0.033	0.048 (0.035; 0.061)	0.99	0.00001

From the above-mentioned results, it is evident that suitable statistical levels of fit, congruent to what is deemed acceptable, are suggested for the majority of the constructs.

However, the level of fit for the controlled motivation construct suggests only a reasonable fit, with the RMSEA above the recommended level.

Taking all fit-indices into consideration, it was concluded that the measurement models had a satisfactory fit and that these results were thus acceptable for use in further analyses.

Research Question One: Relationships between Perceived Need-Supportive Leadership and Athletes' Motivation, Psychological Well-Being and Performance

H_{1a}: A statistically significant positive relation exists between perceived need-supportive leadership and the autonomous (self-determined) motivation of top adolescent team-sport achievers in South Africa.

H_{1b}: A statistically significant negative relation exists between perceived need-supportive leadership and the controlled (non-self-determined) motivation of top adolescent team-sport achievers in South Africa.

H_{1c}: A statistically significant positive relation exists between perceived need-supportive leadership and the psychological well-being of top adolescent team-sport achievers in South Africa.

H_{1d}: A statistically significant positive relation exists between perceived need-supportive leadership and the performance of top adolescent team-sport achievers in South Africa.

In determining the magnitude of strength of the relationship between the variables, the Pearson's correlation coefficients (r) were computed by correlating the variables and the relevant subscales. A non-directional, two-tailed test of significance was thus applied. In addition, the highlighted correlations also provide statistical evidence of the bivariate relationships suggested in the theoretical model depicting the process of enhanced performance. The correlations matrix is presented in the following Table 12.

Table 12

Pearson Correlation Coefficients for the Total Group (N=453)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Autonomy Support	1														
2. Competence Support	.706**	1													
3. Social Support	.694**	.685**	1												
4. Intrinsic Motivation	.345**	.400**	.311**	1											
5. Identified Regulation	.251**	.325**	.316**	.598**	1										
6. Autonomous Motivation	.348**	.414**	.342**	.966**	.784**	1									
7. Introjected Regulation	-.010	.101*	.094*	.227**	.369**	.295**	1								
8. External Regulation	-.045	.002	.056	.214**	.323**	.269**	.590**	1							
9. Controlled Motivation	-.030	.059	.085	.247**	.389**	.316**	.896**	.887**	1						
10. Vitality	.293**	.385**	.265**	.434**	.350**	.448**	.061	.026	.049	1					
11. Positive Affect	.296**	.376**	.274**	.450**	.329**	.454**	.056	.022	.044	.574**	1				
12. Well-Being	.331**	.426**	.303**	.497**	.379**	.506**	.065	.027	.052	.839**	.927**	1			
13. Self-Rating	.319**	.360**	.316**	.398**	.315**	.410**	.096*	.199**	.164**	.438**	.401**	.467**	1		
14. Coach-Rating	.170**	.216**	.168**	.121*	.156**	.144**	-.046	.021	-.014	.167**	.155**	.179**	.252**	1	
15. Performance	.293**	.348**	.290**	.300**	.281**	.323**	.018	.122**	.077	.355**	.326**	.379**	.716**	.856**	1

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

In reviewing Table 12, a highly significant positive relationship is shown to exist between the majority of variables to be utilised in the model, with the exceptions of coach-rating and intrinsic motivation and introjected regulation and competence support; social support; and self-rating, which are significant only at 0.05 level. Non-significant positive relationships are exhibited between controlled motivation and competence support; social support; vitality; positive affect; well-being; and performance, as well as between introjected regulation and vitality; positive affect; well-being; and performance. Further non-significant positive relationships are revealed between external regulation and competence support; social support; vitality; positive affect; well-being; and coach-rating. Finally, non-significant negative relationships are displayed between autonomy support and introjected regulation; external regulation; and controlled motivation, as well as between coach-rating and introjected regulation; and controlled motivation.

Research Question Two: Predicting Athletes' Performance

H_2: Statistically significant path coefficients exist which support that performance can be predicted by the perceived need-supportive leadership, motivation and psychological well-being of top adolescent team-sport achievers in South Africa.

In evaluating research question two and the results relating to the process or paths depicting the variables influencing optimal performance, structural equation modelling (SEM) was utilised. The soft modelling approach, involving the use of partial least squares (PLS), was employed. The statistical results of the measurement model (outer model) used in the evaluation of the theoretical model (inner model), followed by the results of the theoretical model are presented in Tables 13 and 14.

Table 13

Measurement Model 1: Total Group

Variable	**AVE**	**Composite Reliability**	R^2
Coaching Style	0.7955	0.9210	0.0000
Autonomous Motivation	0.7976	0.8873	0.1709
Controlled Motivation	0.7821	0.8771	0.0010
Well-being	0.7871	0.8809	0.3067
Performance	0.5969	0.7331	0.2627

It is evident from Table 13 that all the latent variables demonstrate a composite reliability (internal consistency) value above the accepted 0.7 and that the average variance extracted (AVE) values of all the latent variables are above the recommended 0.5 value. Thus, the above results provide acceptable levels of reliability and validity to proceed with the evaluation of the structural model (inner model). The statistical results of the structural model (inner model) are presented next.

Table 14

Path Coefficients for Theoretical Model 1: Total Group

Latent Variable: Path direction	**Path Coefficient**	**Standard Error**	***t*-value**
Coaching Style → Autonomous Motivation	0.413	0.040	10.305**
Coaching Style → Controlled Motivation	0.031	0.062	0.504
Coaching Style → Well-being	0.224	0.046	4.885**
Autonomous Motivation → Well-being	0.444	0.044	10.037**
Controlled Motivation → Well-being	-0.112	0.049	2.287*
Well-being → Performance	0.373	0.046	8.153**
Autonomous Motivation → Performance	0.189	0.055	3.455**
Controlled Motivation → Performance	0.076	0.058	1.325

Note: ** $p<0.01$ (critical *t*-value = ≥ 2.58). * $p<0.05$ (critical *t*-value = ≥ 1.96)

Figure 3 summarises the findings of theoretical model 1. The path coefficients are shown, with the *t*-values indicated in brackets. A *t*-value of 1.96 and above is indicative of a significant path coefficient. As indicated in Table 14 and Figure 3, not all the path

coefficients are significant, as is demonstrated between coaching style and controlled motivation and from controlled motivation to performance. The R^2 shows a moderate value of 0.26 for the total group.

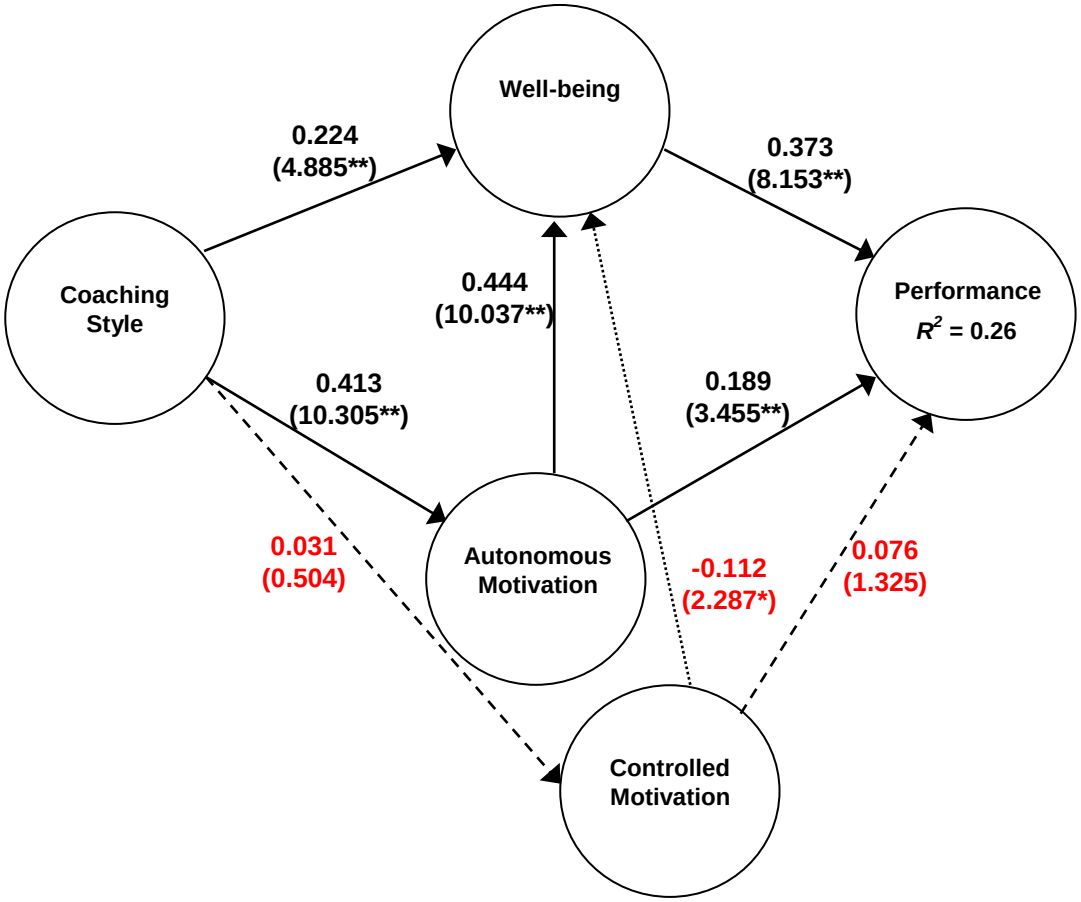

Figure 3. Theoretical model 1 of variables influencing performance (Total Group)
Note: ** p<0.01 (critical t-value = ≥ 2.58). * p<0.05 (critical t-value = ≥ 1.96
R^2 indicates the amount of explained variance of endogenous latent variables

Based on these emerging results, a non-significant path coefficient is apparent between coaching style and controlled motivation. In addition, no significant path coefficient is evident between controlled motivation and performance. Whilst a significant (negative) path coefficient exists between controlled motivation and well-being, the theory does not justify treating controlled motivation as being independent of coaching style. Given these non-significant path coefficients, controlled motivation was removed from the proposed theoretical model and the model was re-evaluated. Thus, a second model, depicting only

autonomous motivation, was utilised. The statistical results of the ultimate measurement model, followed by the results of the final theoretical model, are presented in Tables 15 and 16.

Table 15

Measurement Model 2 (Final Model): Total Group

Variable	**AVE**	**Composite Reliability**	R^2
Coaching Style	0.7955	0.9210	0.0000
Autonomous Motivation	0.7976	0.8873	0.1708
Well-being	0.7871	0.8809	0.2958
Performance	0.5993	0.7363	0.2562

Table 15 shows the measurement values provided to exhibit acceptable levels for both the AVE (0.5) and composite reliability (0.7). Thus, an evaluation of the structural model follows.

Table 16

Path Coefficients for Theoretical Model 2 (Final Model): Total Group

Latent Variable: Path direction	**Path Coefficient**	**Standard Error**	***t*-value**
Coaching Style → Autonomous Motivation	0.413	0.039	10.631**
Coaching Style → Well-being	0.239	0.048	4.994**
Autonomous Motivation → Well-being	0.400	0.046	8.736**
Well-being → Performance	0.359	0.050	7.207**
Autonomous Motivation → Performance	0.220	0.049	4.451**

Note: ** $p<0.01$ (critical *t*-value = ≥ 2.58). * $p<0.05$ (critical *t*-value = ≥ 1.96)

Figure 4 summarises the findings of the ultimate theoretical model. The path coefficients are shown, with the *t*-values indicated in brackets. As indicated in Table 16 and Figure 4, all path coefficients are significant with *t*-values = ≥ 2.58. The R^2 continues to show a moderate value of 0.26 for the total group.

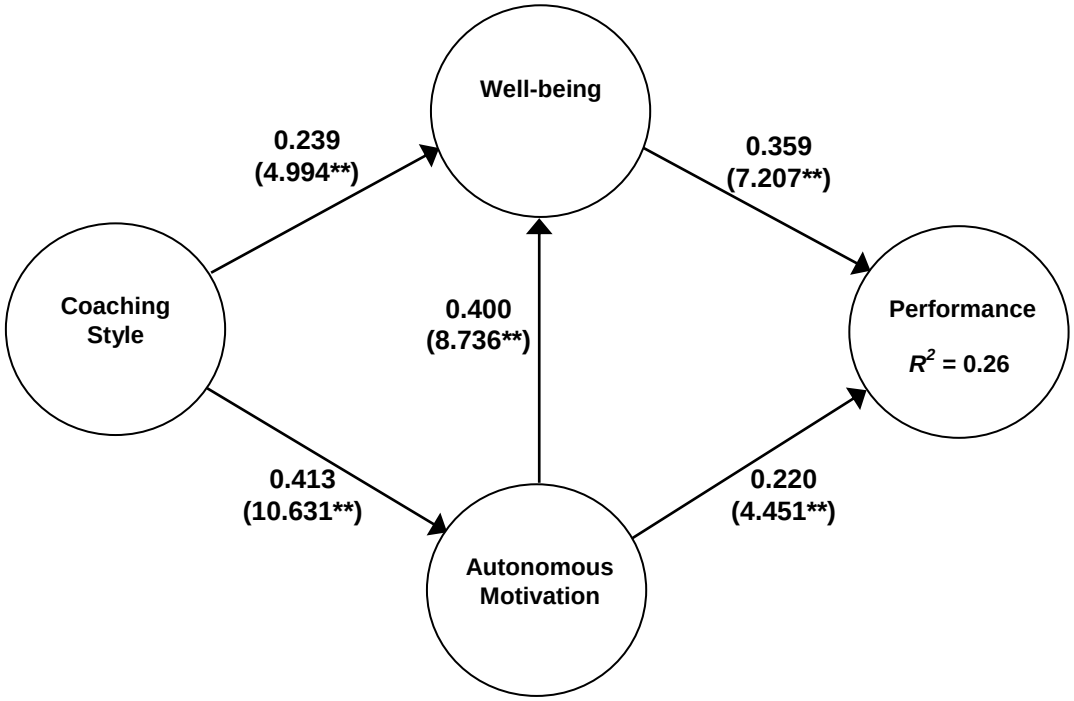

Figure 4. Theoretical model (final) of variables influencing performance (Total Group)
Note: ** p<0.01 (critical t-value = ≥ 2.58). * p<0.05 (critical t-value = ≥ 1.96
R^2 indicates the amount of explained variance of endogenous latent variables

Research Question Three: Investigating Differences Across Gender and Race

Research question three investigated the meaningful differences with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and performance variables across gender and race.

Gender: Correlational analyses of the predictor variables that are related to the performance of adolescent male and female athletes are presented in Tables 17 and 18. In addition, the highlighted correlations also provide statistical evidence of the bivariate relationships suggested in the theoretical model depicting the process of enhanced performance.

Table 17

Pearson Correlation Coefficients for the Male Group (N=254)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Autonomy Support	1														
2. Competence Support	.662**	1													
3. Social Support	.629**	.640**	1												
4. Intrinsic Motivation	.220**	.293**	.162**	1											
5. Identified Regulation	.178**	.288**	.243**	.612**	1										
6. Autonomous Motivation	.227**	.319**	.205**	.963**	.802**	1									
7. Introjected Regulation	.087	.198**	.187**	.239**	.440**	.331**	1								
8. External Regulation	.062	.113	.150*	.291**	.388**	.352**	.590**	1							
9. Controlled Motivation	.084	.177**	.190**	.296**	.466**	.382**	.904**	.879**	1						
10. Vitality	.239**	.327**	.185**	.374**	.309**	.387**	.077	.040	.066	1					
11. Positive Affect	.207**	.250**	.182**	.396**	.199**	.367**	.015	.063	.042	.451**	1				
12. Well-Being	.257**	.329**	.214**	.451**	.284**	.437**	.047	.062	.061	.787**	.905**	1			
13. Self-Rating	.278**	.295**	.257**	.394**	.286**	.394**	.159*	.271**	.238**	.349**	.309**	.380**	1		
14. Coach-Rating	.111	.179**	-.012	.109	.109	.119	-.126*	-.043	-.097	.212**	.175**	.222**	.207**	1	
15. Performance	.237**	.295**	.137*	.301**	.240**	.309**	.001	.123*	.066	.349**	.301**	.374**	.715**	.832**	1

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

Table 18

Pearson Correlation Coefficients for the Female Group (N=199)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Autonomy Support	1														
2. Competence Support	.730**	1													
3. Social Support	.746**	.705**	1												
4. Intrinsic Motivation	.438**	.476**	.439**	1											
5. Identified Regulation	.332**	.374**	.411**	.591**	1										
6. Autonomous Motivation	.447**	.490**	.471**	.970**	.771**	1									
7. Introjected Regulation	-.048	.091	.074	.263**	.312**	.303**	1								
8. External Regulation	-.031	.065	.130	.256**	.321**	.300**	.562**	1							
9. Controlled Motivation	-.045	.089	.115	.294**	.358**	.341**	.893**	.874**	1						
10. Vitality	.341**	.442**	.348**	.490**	.396**	.507**	.064	.055	.068	1					
11. Positive Affect	.360**	.480**	.346**	.489**	.482**	.533**	.141*	.074	.123	.708**	1				
12. Well-Being	.380**	.501**	.374**	.528**	.482**	.564**	.119	.071	.108	.893**	.950**	1			
13. Self-Rating	.381**	.463**	.410**	.415**	.356**	.436**	.026	.154*	.099	.557**	.527**	.582**	1		
14. Coach-Rating	.203**	.221**	.346**	.113	.209**	.153*	.071	.166*	.132	.108	.111	.118	.314**	1	
15. Performance	.337**	.390**	.455**	.288**	.329**	.327**	.064	.197**	.145*	.356**	.342**	.375**	.725**	.882**	1

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

From Table 17 it is evident that the majority of variables correlate significantly at the 1% level for the male group, barring the relationships between external regulation and social support; and performance, between self-rating and introjected regulation, and between performance and social support, which are significant at only the 5% level. No relationship is shown to exist between external regulation and autonomy support; competence support; vitality; positive affect; and well-being, or between introjected regulation and autonomy support; vitality; positive affect; well-being; and performance. Furthermore, no relationship is shown to exist between controlled motivation and autonomy support; vitality; positive affect; well-being; and performance, and between coach-rating and autonomy support; intrinsic motivation; identified regulation; and autonomous motivation. A significant negative relationship is exhibited between coach-rating and introjected regulation, whilst non-significant negative relationships are displayed between coach-rating and social support; external regulation; and controlled motivation.

Table 18 indicates the following relationships for the female group: all variables correlate at the 0.01 level, except for coach-rating and autonomous motivation; external regulation, self-rating and external regulation, controlled motivation and performance, and positive affect and introjected regulation (0.05 level). Non-significant relationships are evident between coach-rating and intrinsic motivation; introjected regulation; controlled motivation; vitality; positive affect; and well-being, and between introjected regulation and competence support; social support; vitality; well-being; self-rating; and performance. Further non-significant relationships are displayed between controlled motivation and competence support; social support; vitality; positive affect; well-being; and self-rating, and between external regulation and competence support; social support; vitality; positive affect; and well-being. Non-significant negative relationships are displayed between autonomy support and introjected regulation; external regulation; and controlled motivation.

Following are the results of the measurement models for the male and female athletes, presented in Table 19.

Table 19

Measurement Model: Male and Female Athletes

Variable	Gender	AVE	Composite Reliability	R^2
Coaching Style	Male	0.7594	0.9044	0.0000
	Female	0.8175	0.9307	0.0000
Autonomous Motivation	Male	0.8034	0.8909	0.0911
	Female	0.7949	0.8857	0.2647
Well-being	Male	0.7248	0.8403	0.2252
	Female	0.8539	0.9212	0.3618
Performance	Male	0.5874	0.7295	0.2187
	Female	0.6068	0.7374	0.3319

The measurement values provided in Table 19 exhibit acceptable levels for both the AVE (0.5) and composite reliability (0.7). Hence, an evaluation of the structural model can be completed. Firstly, summaries of the path fit statistics for the structural models for the male and female athletes are provided, followed by a schematic representation of the combined model.

Table 20

Path Coefficients for the Theoretical Model for Male Athletes

Latent Variable: Path direction	Path Coefficient	Standard Error	*t*-value
Coaching Style → Autonomous Motivation	0.302	0.061	4.969**
Coaching Style → Well-being	0.213	0.059	3.594**
Autonomous Motivation → Well-being	0.365	0.052	6.976**
Well-being → Performance	0.314	0.057	5.558**
Autonomous Motivation → Performance	0.237	0.059	4.047**

Note: ** $p<0.01$ (critical *t*-value = ≥ 2.58). * $p<0.05$ (critical *t*-value = ≥ 1.96)

Table 21

Path Coefficients for the Theoretical Model for Female Athletes

Latent Variable: Path direction	**Path Coefficient**	**Standard Error**	***t*-value**
Coaching Style → Autonomous Motivation	0.515	0.052	9.915**
Coaching Style → Well-being	0.240	0.080	3.015**
Autonomous Motivation → Well-being	0.442	0.070	6.357**
Well-being → Performance	0.460	0.071	6.530**
Autonomous Motivation → Performance	0.173	0.076	2.282*

Note: ** $p<0.01$ (critical t-value = ≥ 2.58). * $p<0.05$ (critical t-value = ≥ 1.96)

As can be deduced from both Tables 20 and 21, all paths are significant. In the following Figure 5, path coefficients are provided for both males and females with the path coefficients for female athletes indicated in brackets. The R^2 values are shown to be substantial for the female group and moderate for the male group.

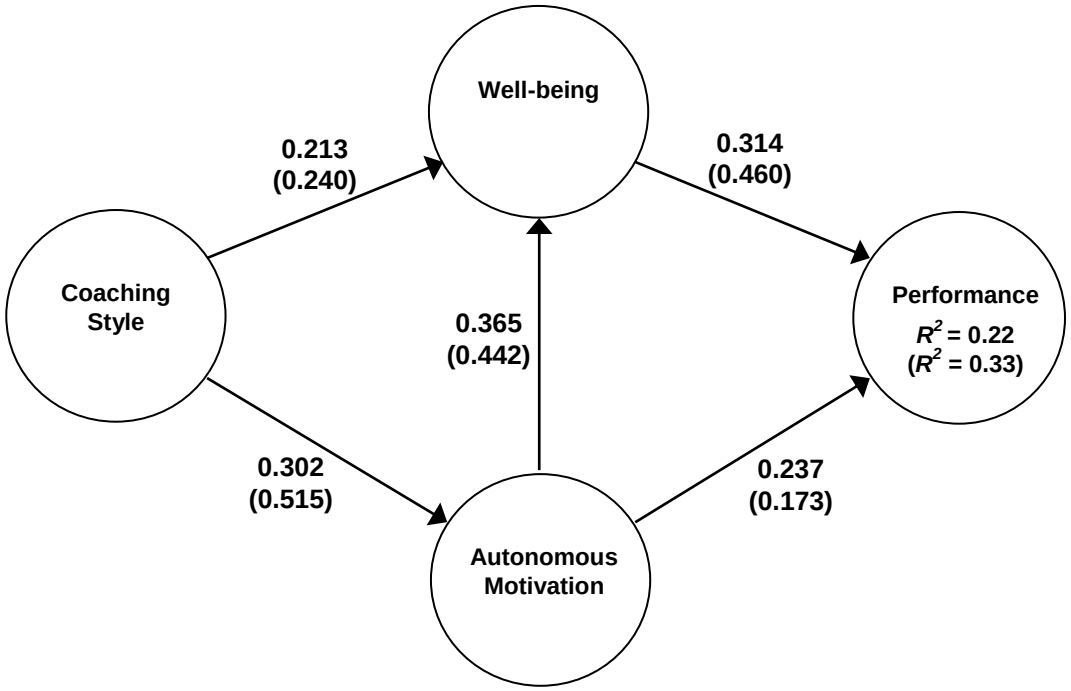

Figure 5. The theoretical model of variables influencing performance (Male and Female groups).
Note: R^2 indicates the amount of explained variance of endogenous latent variables

In order to determine whether significant differences between the path coefficients of male and female athletes exist, a PLS-SEM multigroup analysis (PLS-MGA) was executed

for comparing the PLS-SEM model estimates of each gender group. If the standard errors were equal, a parametric test was computed. If the standard errors were unequal, a non-parametric test was used. Following in Table 22 are the results of this analysis.

Table 22

Results of the PLS-MGA: Male and Female Athletes

	Gender			
Latent Variable: Path direction	***t*-value**	***df***	***p*-value**	**Unequal SE**
Coaching Style → Autonomous Motivation	2.669	448	0.008	Yes
Coaching Style → Well-being	0.273	384	0.785	Yes
Autonomous Motivation → Well-being	0.888	386	0.375	Yes
Well-being → Performance	1.638	451	0.102	No
Autonomous Motivation → Performance	0.667	393	0.505	Yes

From the information provided in Table 22, a significant difference is detected between male and female athletes with regards to the path coefficient of coaching style to autonomous motivation. In combining these results with those presented in Figure 5, it is observed that the pathway between coaching style and autonomous motivation shows a stronger influence for the female group as compared to the male group.

Race: Correlational analyses of the predictor variables that are related to the performance of adolescent black and white athletes are presented in Tables 23 and 24. In addition, the highlighted correlations also provide statistical evidence of the bivariate relationships suggested in the theoretical model depicting the process of enhanced performance.

Table 23

Pearson Correlation Coefficients for the Black Group (N=186)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Autonomy Support	1														
2. Competence Support	.648**	1													
3. Social Support	.634**	.559**	1												
4. Intrinsic Motivation	.311**	.332**	.270**	1											
5. Identified Regulation	.185*	.265**	.324**	.597**	1										
6. Autonomous Motivation	.299**	.342**	.315**	.961**	.794**	1									
7. Introjected Regulation	.051	.172*	.148*	.218**	.426**	.311**	1								
8. External Regulation	-.067	-.017	.149*	.222**	.349**	.288**	.573**	1							
9. Controlled Motivation	-.010	.087	.167*	.248**	.436**	.337**	.885**	.889**	1						
10. Vitality	.202**	.246**	.146*	.354**	.308**	.374**	.083	.011	.053	1					
11. Positive Affect	.321**	.309**	.306**	.375**	.223**	.361**	.081	.034	.065	.444**	1				
12. Well-Being	.318**	.331**	.281**	.429**	.302**	.428**	.096	.029	.070	.785**	.904**	1			
13. Self-Rating	.228**	.225**	.212**	.371**	.271**	.374**	.178*	.282**	.260**	.362**	.299**	.380**	1		
14. Coach-Rating	.067	.195**	.139	.034	.124	.068	.088	.024	.063	.094	.094	.110	.244**	1	
15. Performance	.177*	.264**	.217**	.235**	.241**	.261**	.163*	.178*	.192**	.272**	.236**	.293**	.741**	.832**	1

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

Table 24

Pearson Correlation Coefficients for the White Group (N=267)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Autonomy Support	1														
2. Competence Support	.737**	1													
3. Social Support	.729**	.754**	1												
4. Intrinsic Motivation	.368**	.447**	.350**	1											
5. Identified Regulation	.290**	.360**	.302**	.608**	1										
6. Autonomous Motivation	.377**	.460**	.367**	.970**	.783**	1									
7. Introjected Regulation	-.062	.037	.020	.250**	.323**	.295**	1								
8. External Regulation	-.054	-.017	-.066	.234**	.295**	.274**	.579**	1							
9. Controlled Motivation	-.066	.012	-.024	.273**	.349**	.321**	.900**	.876**	1						
10. Vitality	.350**	.474**	.342**	.488**	.378**	.498**	.040	.029	.039	1					
11. Positive Affect	.290**	.434**	.281**	.495**	.416**	.516**	.062	.045	.060	.673**	1				
12. Well-Being	.343**	.491**	.333**	.536**	.437**	.554**	.058	.042	.056	.878**	.945**	1			
13. Self-Rating	.384**	.457**	.394**	.422**	.349**	.438**	.032	.132*	.090	.497**	.484**	.533**	1		
14. Coach-Rating	.254**	.264**	.246**	.164**	.204**	.191**	-.078	.099	.007	.229**	.176**	.215**	.274**	1	
15. Performance	.383**	.428**	.382**	.337**	.328**	.365**	-.040	.140*	.052	.423**	.378**	.432**	.715**	.868**	1

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

In reviewing the correlations for the black group in Table 23, significant positive relationships are shown to exist between the majority of variables. Non-significant relationships are exhibited between coach-rating and autonomy support; social support; intrinsic motivation; identified regulation; autonomous motivation; introjected regulation; external regulation; controlled motivation; vitality; positive affect; and well-being. Further non-significant relationships are found between introjected regulation and autonomy support; vitality; positive affect; and well-being, as well as between controlled motivation and competence support; vitality; positive affect; and well-being and, finally, between external regulation and vitality; positive affect; and well-being. Non-significant negative relationships are displayed between autonomy support and external regulation; and controlled motivation, and between competence support and external regulation.

For the white group (Table 24), all relationships are highly significant, barring external regulation and self-rating; and performance (5% level). Introjected regulation and competence support; social support; vitality; positive affect; well-being; and self-rating, and controlled motivation and competence support; vitality; positive affect; well-being; self-rating; coach-rating; and performance show non-significant relationships. As do external regulation and vitality; positive affect; well-being; and coach-rating. Non-significant negative relationships are displayed between introjected regulation and autonomy support; coach-rating; and performance, between external regulation and autonomy support; competence support; and social support, as well as between controlled motivation and autonomy support; and social support.

Next, the results of the measurement models for the black and white athletes are presented in Table 25.

Table 25

Measurement Model: Black and White Athletes

Variable	Race	AVE	Composite Reliability	R^2
Coaching Style	Black	0.7423	0.8963	0.0000
	White	0.8254	0.9341	0.0000
Autonomous Motivation	Black	0.7962	0.8864	0.1361
	White	0.8028	0.8906	0.1954
Well-being	Black	0.7219	0.8385	0.2216
	White	0.8365	0.9110	0.3504
Performance	Black	0.5796	0.7096	0.1913
	White	0.6141	0.7516	0.3122

The latent variables of both the black and white athletes provide acceptable levels of reliability (0.7) and validity (0.5) to proceed with the evaluation of the structural model, of which a summary is provided in Tables 26 and 27, respectively.

Table 26

Path Coefficients for the Theoretical Model for Black Athletes

Latent Variable: Path direction	Path Coefficient	Standard Error	*t*-value
Coaching Style → Autonomous Motivation	0.369	0.076	4.854**
Coaching Style → Well-being	0.224	0.071	3.167**
Autonomous Motivation → Well-being	0.340	0.064	5.286**
Well-being → Performance	0.284	0.066	4.278**
Autonomous Motivation → Performance	0.234	0.071	3.289**

Note: ** $p<0.01$ (critical *t*-value = ≥ 2.58). * $p<0.05$ (critical *t*-value = ≥ 1.96)

Table 27

Path Coefficients for the Theoretical Model for White Athletes

Latent Variable: Path direction	Path Coefficient	Standard Error	*t*-value
Coaching Style → Autonomous Motivation	0.442	0.049	9.091**
Coaching Style → Well-being	0.254	0.059	4.329**
Autonomous Motivation → Well-being	0.434	0.055	7.914**
Well-being → Performance	0.416	0.062	6.710**
Autonomous Motivation → Performance	0.210	0.062	3.358**

Note: ** $p<0.01$ (critical *t*-value = ≥ 2.58). * $p<0.05$ (critical *t*-value = ≥ 1.96)

The path directions shown in the above tables for both black and white athletes are all significant (with *t*-values = ≥ 2.58). Figure 6 follows, providing a schematic summary of the path coefficients for both racial groups, with the path coefficients for white athletes indicated in brackets. A substantial R^2 value is indicated for the white group, whilst the R^2 value for the black group proves to be weaker.

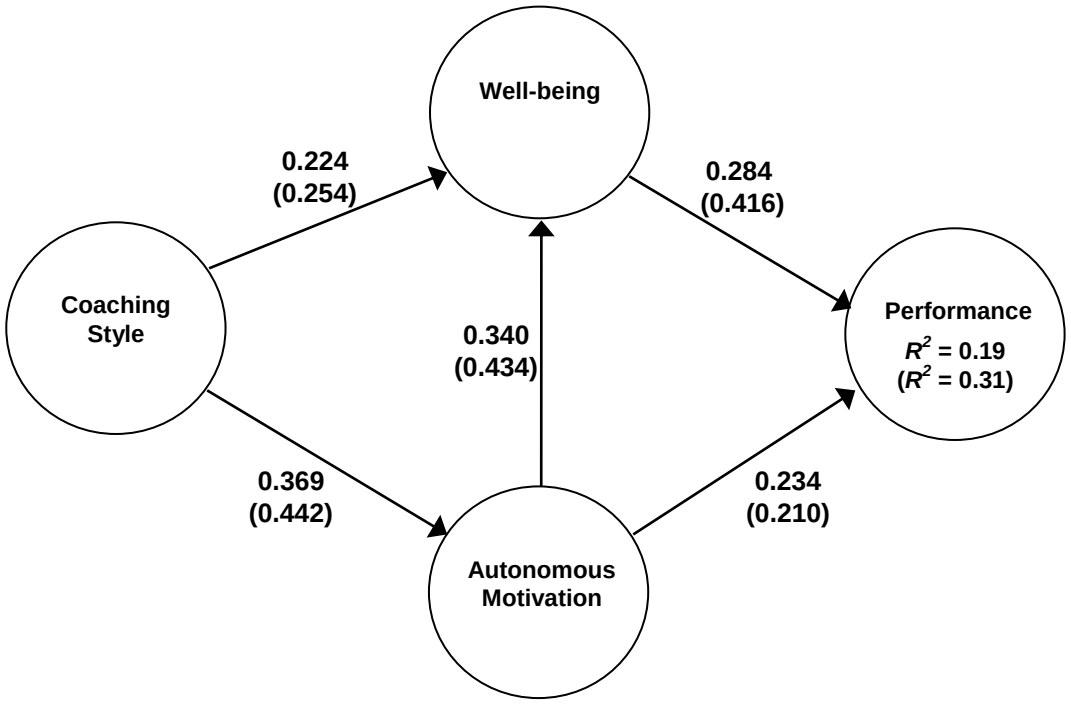

Figure 6. The theoretical model of variables influencing performance (Black and White groups)
R^2 indicates the amount of explained variance of endogenous latent variables

In determining whether significant differences between the path coefficients of black and white athletes exist, the following results, as depicted in Table 28, emerged.

Table 28

Results of the PLS-MGA: Black and White Athletes

	Race			
Latent Variable: Path direction	***t*-value**	***df***	***p*-value**	**Unequal SE**
Coaching Style → Autonomous Motivation	0.811	327	0.418	Yes
Coaching Style → Well-being	0.334	451	0.738	No
Autonomous Motivation → Well-being	1.112	451	0.267	No
Well-being → Performance	1.431	451	0.153	No
Autonomous Motivation → Performance	0.256	451	0.798	No

According to the results reflected in Table 28, no significant differences are shown to exist between black and white athletes.

Summary

In the current chapter, an exposé of the quantitative analysis of the data collected was provided. Suitable statistical levels of fit were suggested for the majority of the constructs, with the exception of the controlled motivation construct, which showed a reasonable fit, as the RMSEA proved to be slightly above the recommended level. Pearson's correlation coefficients (*r*) were computed by correlating the variables and the relevant subscales. A non-directional, two-tailed test of significance was applied, largely confirming the hypotheses that perceived need-supportive leadership is positively related to an increase in the athletes' autonomous motivation, psychological well-being and performance. Structural equation modelling (SEM) was utilised in evaluating the results relating to the process or paths depicting the variables influencing optimal performance. The conceptual model with its hypothesised paths indicated significant path coefficients and explained 26% of the variance in performance, for the total group of athletes. In determining significant differences between the path coefficients of the gender and racial groups, a PLS-SEM multigroup analysis (PLS-MGA) was executed for comparing the PLS-SEM model estimates of each group. SDT's notion of universality held true for the models fitted to the gender and racial groups, barring the significant difference detected between male and female athletes with regard to the path coefficient of coaching style to autonomous motivation. No significant differences emerged between black and white athletes.

In the following Chapter Six, the interpretation and implications of these findings will be discussed, together with the provision of recommendations for future research within the field of sport psychology.

CHAPTER SIX

Discussion

The aim of this study was to investigate the statistical effect of a coach's perceived leadership style on the ensuing psychological well-being, motivation and performance of top achieving adolescent team-sport athletes in South Africa.

In this chapter, the research findings reported in Chapter Five are discussed and interpreted in light of the self-determination theory (SDT) and other dominant perspectives that have been embarked on in the study of leadership and motivation in sport (detailed in the literature survey, Chapters Two and Three) and within the South African setting. The theoretical and practical implications of the results are also considered. This is followed by a discussion of the limitations of the study, after which final recommendations for future research are provided. The chapter is brought to a close with an integrated conclusion.

Major Findings of the Study

Research Question One

H_{1a}: A statistically significant positive relation exists between perceived need-supportive leadership and the autonomous (self-determined) motivation of top adolescent team-sport achievers in South Africa.

This hypothesis was confirmed, as significant positive correlations, signifying relatively moderate relationships, were found between autonomous motivation and perceived competence support; perceived autonomy support; and perceived support for relatedness. This would indicate that the view these athletes take of their coaches' need-supportive behaviour holds a definite relation to the quality of motivation experienced by the athletes. These findings support research conducted by Sheldon and Watson (2011), with a group of student athletes, who found the perceived autonomy supportiveness of the coach to be associated with the two autonomous forms of motivation, namely intrinsic motivation (moderate correlation) and identified regulation (low correlation). The results further concur with studies conducted in the field of school physical education (Koka & Hagger, 2010;

Ntoumanis, 2005; Standage, Duda & Ntoumanis, 2003; 2005; Taylor & Ntoumanis, 2007), indicating perceptions of need satisfaction to be directly and positively correlated with autonomous (self-determined) motivation.

Perceived competence support manifested as the strongest of the three needs in relation to autonomous motivation (showing a moderate relationship). This finding is understandable, considering that previous researchers (Reinboth & Duda, 2006; Quested & Duda, 2009) have claimed that the athletes' ability within their sport would be their main point of focus and the functional significance of perceived competence would thus likely exceed that of the needs for perceived autonomy and relatedness, within an achievement setting. Competence, referred to by Ryan and Deci (2002) as the perception of mastery and a sense of efficacy in performance, is after all extensively regarded as an ultimate expression of motivation, specifically within the sporting context (Calvo, Cervello, Jiménez, Iglesias & Murcia, 2010; Reinboth & Duda, 2006).

A further observation is that the athletes' perceived sense of relatedness (in connection with the coach) and their sense of perceived autonomy were equally related to their autonomous motivation. This would contradict the notions of SDT's cognitive evaluation theory (CET), which refers to relatedness as playing a more distal role in determining intrinsic motivation, as well as previous research with adolescents in the field of sport (eg. Kipp & Amorose, 2009) which found the relation between perceived relatedness with team members and self-determined motivation to be non-significant or weak. This discrepancy could possibly be due to the fact that, in the current study, the perception of relatedness was connected to the coach alone and did not include perceived relatedness with fellow teammates (as measured by Kipp & Amorose in 2009).

In conjunction, these findings align with a longstanding postulate of SDT, in that athletes' perceptions of their coaches' leadership style as need-supportive, positively

facilitate the athletes in obtaining optimal motivational outcomes, in the form of autonomous (self-determined) motivation.

H_{1b}: A statistically significant negative relation exists between perceived need-supportive leadership and the controlled (non-self-determined) motivation of top adolescent team-sport achievers in South Africa.

As previously stated, according to SDT, the perceived fulfilment of the basic needs provides the incitement for intrinsic (autonomous / self-determined) motivation, whilst perceived lack thereof, or no fulfilment, is considered to be the incitement for extrinsic (controlled) motivation and amotivation (Carson & Chase, 2009). Thus, motivation will only be obtained, sustained or enhanced once there is the perception that these needs have been met. This overarching notion of SDT was the rationale for forming the above-stated hypothesis.

The product terms between controlled motivation, on the one hand, and perceived competence support, perceived autonomy support and perceived support for relatedness, on the other hand, proved to be non-significant. The hypothesis that perceived need-supportive leadership is negatively related to controlled motivation was thus not confirmed. Similar non-significant findings were reported in studies conducted with two groups of British individual and team-sport athletes (Ntoumanis & Standage, 2009; Smith, Ntoumanis & Duda, 2007), as well as with Canadian male and female university rugby players (Pope & Wilson, 2012).

These non-significant findings are aligned with SDT's organismic integration theory (OIT), which suggests that as critical a component as what intrinsic motivation is in the concept of motivation, extrinsic factors form an equally integral part in leading motivated behaviour within the sporting context. Within sport, there are certain elements essential to high performance, which are not necessarily intrinsically motivating to athletes (Ryan & Deci, 2007). These elements include conditioning; repetitive training, practice and skills

building; disciplined exercise and body work. Furthermore, direct extrinsic incentives are provided by the social context, e.g. sport scholarships and monetary rewards. Therefore, the current findings are analogous to an emerging trend in sport-related research

H_{1c}: A statistically significant positive relation exists between perceived need-supportive leadership and the psychological well-being of top adolescent team-sport achievers in South Africa.

Supporting this hypothesis, the current study found statistically significant bivariate correlations to exist between well-being and perceived competence support (moderate relation); perceived autonomy support (low to moderate relation); and perceived support for relatedness (low relation). More specifically, significant positive bivariate correlations were found between the indicators of well-being, namely vitality and positive affect, and the perceived satisfaction of the needs for competence, relatedness and autonomy.

This finding is consistent with previous research in the team-sport domain, as the literature (Adie, Duda & Ntoumanis, 2012; Mack, et al., 2011; Reinboth, Duda & Ntoumanis, 2004; Solberg & Halvari, 2009) indicates that athletes who perceived their coach to be need-supportive, displayed higher levels of well-being. No contending studies, disputing the link between perceived need-supportive leadership and well-being, could be traced in the literature.

These present results would intimate that the athletes experience a boost in their energy, together with yielding the most positive psychological outcomes, when involved in activities (under the leadership of the coach) that are conducive to them experiencing feelings of being capable and effective, the perception of control and that their behaviour is self-chosen, as well as feeling secure and connected with the coach. Once again, perceived competence support emerged as the strongest of the three needs in relation to well-being (showing a moderate relation). This would suggest the importance of a structured coaching

and training environment where skill-building is encouraged; support for creativity is provided; athletes are engaged in clearly defined tasks and activities that are optimally challenging but suitable to their competencies; and the athletes are supplied with appropriate feedback and positive reinforcement for mastery and progress. A previous study by Reinboth, Duda and Ntoumanis (2004) has also shown perceived competence support to play a central role in facilitating the optimal psychological functioning of youth in sport.

These results further align with, and reinforce, the importance of SDT's assertion that a coach-created, need-supportive environment, which leads to the perceived fulfilment of the three basic psychological needs, denotes the required conditions for the promotion of psychological well-being (subjective vitality and positive affect) and optimal physical and psychological development within athletes.

H_{1d}: A statistically significant positive relation exists between perceived need-supportive leadership and the performance of top adolescent team-sport achievers in South Africa.

In the current study, the performance-based outcome pertained to a differentiated assessment of the athletes' performance. This measure was obtained by the inclusion of both a self- and coach-rating of (i) talent and potential development on five components (technical, tactical, physical, psychological and overall) and (ii) overall performance. Ratings of intrapersonal development and interpersonal performance (normative comparison) over the most recently completed season were combined to form a composite measure of performance. A significant correlation (small effect size) emerged between the self- and coach-rating variables, showing that the perceptions of the individual athletes were related to the coaches' perceptions of performance.

It seems a paucity of research has investigated perceived need-supportive leadership as a determinant of athlete performance within the sport setting. Even more apparent, is the

scarcity of sport-specific, performance-based studies done (although perhaps simply unreported) within a South African context.

In the current study, the existence of significant positive bivariate correlations between the criterion variable of athletes' performance and their perceptions of support for competence, autonomy and relatedness, confirms the above-stated hypothesis. The handful of studies found, examining a link between a coach's need-support and the subsequent athletic performance, correspond with the current findings (Halvari, Ulstad, Bagøien & Skjesol, 2009; Sheldon & Watson, 2011). In contrast, a study investigating the role of positive competence feedback (a component or function of need-supportive leadership) found positive feedback not to have a direct effect on the performance of adolescent physical education students (Mouratidis, Vansteenkiste, Lens & Sideridis, 2008). This discrepancy could be due to the manner in which performance was measured, as the assessed performance was effort-based and barely required any concentration or mastering of techniques on the athletes' part.

These results emphasise the importance of the quantity and quality of performance feedback provided by the coaches, the processes utilised in decision-making, and the relationships coaches establish with the athletes for athletes to train and perform at their finest and function at an optimal physical and psychological level. Coaches would therefore be well advised to take cognisance of their role as influential socialising agents and understand which of their behaviours are effective (or ineffective) in promoting high levels of athletic performance and facilitating the physical, psychological and emotional well-being of the athletes.

Furthermore, it has been stated that adolescents, at certain stages, tend to be sensitive to performance criticism (Berk, 2003). Thus it would most likely be especially beneficial for coaches to convey performance and competence feedback in a need-supportive, non-controlling manner.

Finally, due to the apparent lack of studies directly linking team-sport athletes' perceived need-supportive leadership provided by their coach to their subsequent performance, it is believed that the current results contribute to the literature in this regard.

Summary of findings for research question one. Significant positive relationships were found to exist between the perceived need-supportive leadership provided by the coaches and the ensuing psychological well-being, autonomous motivation and performance of top achieving adolescent team-sport athletes in South Africa.

Research Question Two

H_2: Statistically significant path coefficients exist which support that performance can be predicted by the perceived need-supportive leadership, motivation and psychological well-being of top adolescent team-sport achievers in South Africa.

The results from the structural equation modelling analyses were supportive of the hypothesised model and proposed pattern of sequences, revealing that all hypothesised paths were significant. Using the framework of SDT, the following section will be a discussion of each of the proposed paths or linkages and the implications of the current findings.

Proposition 1: Perceived need-supportive leadership is positively related to autonomous motivation. The current study established a statistically significant path coefficient between the perceived need-supportive coaching style and the autonomous motivation of the athletes, implying that when athletes experience their coaches' leadership style to be satisfying their three basic needs, an enhancement in their intrinsic motivation and an integration of their extrinsic motivation will occur. Hence, the athletes will possess an inherent tendency and interest in eagerly developing new skills and engaging in challenges, or undertaking activities after accepting the value and purpose of and identifying with the activities. In supporting the internalisation process, Ryan and Deci's (2007) OIT asserts the following. Firstly, the perception of competence is necessary in order to be motivated in any

fashion. Secondly, the perceptions of competence and relatedness are required for introjected regulation / motivation. Finally, together with the perceptions of competence and relatedness, a sense of autonomy is essential for the identification or integration of a behaviour in the motivational process.

Pope and Wilson (2012) noted significant indirect effects for the pathway between perceived coach's interpersonal style and autonomous motivation with a group of rugby players, whilst Koka and Hagger (2010) reported that perceived satisfaction of competence and relatedness had significant positive effects on self-determined motivation for a group of secondary school physical education students. The findings of the current study correspond with these above-mentioned results.

The results of the present study also confirm the postulates of SDT in that the impetus of self-determined motivation orientations stems from the perceived satisfaction of the three universal basic psychological needs for autonomy, competence and relatedness (Ryan & Deci, 2002). Furthermore, this study supports the general consensus of sport scientists and researchers investigating SDT, in that athletes are inclined to experience greater psychological need satisfaction, and thus enhanced self-determination, when coaches take on a coaching orientation that is need-supportive, by engaging in behaviours that support rather than undercut the athletes' needs for autonomy, competence and relatedness (Almagro, Sáenz-López & Moreno, 2010; Edmunds, Ntoumanis & Duda, 2008; Smith, Ntoumanis & Duda, 2007). The current results substantiate the claims of the CET in particular, which maintains that intrinsic motivation is predominantly shaped by one's feelings of competence and autonomy, especially critical in the domain of sport, whilst also recognising an individual's need for relatedness to be a determinant of intrinsic motivation (Ryan & Deci, 2002).

Proposition 2: Perceived need-supportive leadership is positively related to psychological well-being. Ryan and Deci (2007) claim that even though an individual might not deem the basic psychological needs of autonomy, competence and relatedness as valuable, successful satisfaction of these needs will enhance one's well-being. Thus, it was proposed that the athletes' perceived need-supportive leadership from the coach is positively related to their psychological well-being, as reflected by subjective vitality and positive affect. Supporting this proposition, the current study found the path coefficient between the perceived coaching style and reported psychological well-being of the athlete to be statistically significant.

Previous studies, congruent with this result, include Adie et al.'s (2008; 2012) findings that an environment conducive to perceived need-support, for adult team-sport participants and elite youth soccer players, was positively related to subjective vitality and positive energy. Solberg and Halvari (2009) indicated that more well-being was displayed amongst Olympic individual-sport athletes who perceived their coach as more need-supportive. Furthermore, in considering the implication of the need for relatedness on well-being, Reinboth and Duda (2006) demonstrated that measuring relatedness in connection with the coach, predicted feelings of vitality among university-level student athletes.

The above-mentioned results, including those of the current study, complement the existing literature of the basic psychological needs theory of SDT which advocates that activities that satisfy an individual's basic psychological needs for autonomy, competence and relatedness should provide psychological nutriments to the self and will thus manifest as preserved vitality or a boost in energy (Ryan & Deci, 2008).

Specific to this study, the athletes seemed to appreciate the following behaviours and leadership styles adopted by the coaches: the expression of empathy by the coaches in acknowledging, understanding and regarding the choices, views, thoughts and feelings of the

athletes and thus supporting their need for autonomy; the coaches' conveying of trust in the athletes' abilities and the provision of constructive and positive feedback and encouragement, in support of their need for competence. In supporting their need for relatedness, the athletes valued the interpersonal involvement of the coaches and perceived them to devote psychological resources and time to the coach-athlete relationship.

Overall, these findings provide an expansion of the evidence in SDT research, thus demonstrating the instrumental role of a coaching environment, where the coach is perceived to be fostering the athletes' perspectives, expressing trust in their abilities and providing social support, in contributing to the adolescent athletes' well-being and ensuing optimal functioning. As it appears the satisfaction of the athletes' basic psychological needs and the development and enhancement of their psychological well-being are complementary processes, the conditions that lead to these outcomes should be within the top priorities of the coaches.

Proposition 3: Autonomous motivation is positively related to psychological well-being. A further prominent view of SDT is that self-determined motivation (quality of motivation) will affect salient psychological and behavioural outcomes. More specifically, self-determined motivation is believed to assume a crucial role in the promotion of well-being in individuals (Ryan & Deci, 2002). The present results provide evidence pertaining to the proposed link between autonomous (self-determined) motivation and psychological well-being, in that the path coefficient shows autonomous motivation to positively predict well-being (vitality and positive affect) and the emerging bivariate relationship proves to be substantial.

Additional substantiation of this suggested relationship is provided by research findings within the physical-activity and sport domains. These findings include Standage, Duda and Ntoumanis' study in 2005, which revealed a strong path from intrinsic motivation

to positive affect, for a group of secondary school physical education students. A positive relationship between autonomous motivation and aspects of psychological well-being within a sporting context was further supported in studies done by Gagné et al. (2003); Mouratidis et al. (2008); and Blanchard, Amiot, Perreault and Vallerand (2009).

The participating athletes in the current study, in particular, seemed to experience vitality and positive affect while being intrinsically motivated to experience stimulation and a sense of mastery within their particular sport. Nurturing the athlete's intrinsic motivation is thus crucial, in order to foster well-being and growth within their sport.

In addition, as was established in propositions 1 and 2 above, the perceived interpersonal approach of the coach is an antecedent for the processes underlying the link between self-determination and well-being (increased vitality, more positive affect and satisfaction) amongst the athletes. As suggested by SDT, more specifically CET, certain socio-environmental contexts may foster or hinder psychological need satisfaction and, in turn, motivation and well-being. Moreover, these outcomes may also serve as contributors to enhanced behavioural outcomes, namely performance – which leads us to propositions 4 and 5 of this study.

Proposition 4: Psychological well-being is positively related to performance. The study of performance is imperative, as it denotes one of the ultimate outcomes in sport. Yet, studies linking SDT-based motivational variables with indicators of performance are sorely lacking within the sport domain (Gillet, Berjot & Gobancé, 2009; Gillet, Vallerand & Rosnet, 2009; Gillet, Vallerand, Amoura & Baldes, 2010; Pope & Wilson, 2012; Ryan & Deci, 2007; Vallerand, 2007). Even more so, empirical work within SDT, relating well-being variables with athletic performance, is decidedly scarce, as no studies could be found linking the well-being scales (measuring the athletes' vitality and positive affect) to the rated performance of athletes. The following current results therefore contribute to the literature in this regard.

In the present study, a significant path coefficient, as well as a substantial bivariate relationship, was shown to exist between well-being and performance. This implies that an increase in the coach- and self-rated performance of the athletes can partially be attributed to them feeling vital, positive and psychologically well.

Vitality, defined as energy that can be channelled or regulated for purposive behaviour, has been branded by SDT as an essential resource with a large assortment of benefits (Ryan & Deci, 2008). Therefore, as vitality is not only critical to psychological and physical well-being but also to greater persistence and performance among sport participants, if coaches support their athletes' basic psychological needs it would significantly impact the athletes' vitality, thereby enhancing their psychological well-being and positively affecting their performance.

The present result aligns with SDT, which posits that humans perform and develop efficiently as a consequence of the social environment and its prospect for basic need satisfaction. Furthermore, the present findings hold certain implications for an improved understanding of the determinants of athletes' performance. An expansion on this research is, however, required to further comprehend the role of the athletes' well-being in sport performance. As the measure of performance utilised in this study was of a subjective nature (self- and coach-ratings of athletes' performance), an objective assessment of performance may be instructive in the broader understanding of this pattern of relationships.

Proposition 5: Autonomous motivation is positively related to performance. The results revealed that the athletes' autonomous motivation is significantly and positively associated with their performance. In addition, low to moderate correlations transpired between the indicators of autonomous motivation and performance. In other words, an enhancement in the athletes' self- and coach-rated performance is directly related to the level of autonomous / self-determined motivation experienced by the athletes. This finding was as

expected according to SDT, which upholds that the promotion of self-determined forms of motivation will consistently lead to positive cognitive, affective and behavioural outcomes, including an increase in the athletes' level of performance.

Though limited, the following studies were found to link self-determined motivation with performance. In line with the current study, Gillet, Berjot and Gobancé (2009) found that self-determined motivation positively predicted sport performance (measured by the ratio between each athlete's victories and the number of matches played) for a group of elite adolescent tennis players. Furthermore, the results of two studies conducted with leading adolescent tennis players and swimmers revealed that motivational profiles reflecting the least self-determined motivation led to the worst subsequent sport performance (Gillet, Vallerand & Rosnet, 2009). Finally, a surprising outcome was the result reported by Mouratidis et al. (2008), who found that self-determined motivation was not significantly associated with sport performance for a group of top Belgian athletes. Amotivation was, however, found to negatively predict the performance of this group of Belgian athletes. Furthermore, a similar subjective assessment of performance, as employed in the current study, was utilised by Mouratidis et al. (2008) in that performance was assessed by the coaches' perceptions and ratings of the athletes. The findings of the current study therefore refute the non-significant association reported by these authors.

In sport, motivation is recognised as the foundation of performance and achievement and is deemed an essential ingredient for success. A leading determinant of athletic performance is considered to be the *type* of motivation driving the athletes' behaviour and, taking into consideration the correlations presented in the current study, the athletes' intrinsic motivation and identified regulation (constituting autonomous motivation) seemed to play equal roles in their relation with performance. Ryan and Deci expressed that "athletes are likely to be at their best when motivated by both identified (or integrated) and intrinsic

regulations, rather than operating out of introjected ego involvement or external regulation" (2007, p.18).

It has been established that internalising self-determined motivation regulations and training in a need-supportive environment will likely lead athletes to experience adaptive outcomes shown to be determinants of successful athletic performance and development (Treasure, Lemyre, Kuczka & Standage, 2007). Furthermore, the present results confirm that in order to facilitate self-determined motivation within athletes, a need-supportive coaching style is shown to be effective and the coach would thus, indirectly, encourage athletes' performance. Hence, it would seem that the need-support of the coach is a key determinant in the performance of athletes and it is thus vital for the coach to pay attention to the manner in which the training sessions are structured, conducted and presented, as well as the interpersonal approaches that occur.

Research Question Three

Do meaningful differences exist with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and performance variables across gender and race?

SDT assumes the three basic psychological needs to be universal and cross-developmental and thus the relationship between need fulfilment, motivation and psychological health is expected to be evident in all individuals across genders, ages and cultures, although the means through which these needs are satisfied will differ as a function of gender, age and culture (Ryan & Deci, 2002). Due to this supposition, a further focus of this research was to test whether the pattern of relationships among the variables of the athletes' perceived need-supportive leadership, autonomous motivation, psychological well-being and performance was similar for diverse groups of athletes – specifically male, female, black and white athletes. A major goal of this study was to further our understanding of the

implications of a need-supportive coaching style within the South African context and accordingly enlighten the leaders within South African sport to be able to successfully meet the needs of this culturally diverse population.

In accordance with the tenets of SDT, no meaningful differences were expected to emerge in the hypothesised model, across both genders and races. However, a significant difference was detected between male and female athletes with regards to the path coefficient of perceived need-supportive leadership to autonomous motivation, showing a stronger influence for the female group as compared to the male group and thus suggesting that female athletes' autonomous motivation is more strongly influenced by the coaches' perceived coaching style than is the case for their male counterparts. Furthermore, perceived competence support and perceived support for relatedness showed the strongest correlations with autonomous motivation within the female group, suggesting that their perceived sense of capability, effectiveness and belonging may be closely linked to their autonomous motivation. Together, these results indicate that the female athletes especially appreciate the need-supportive style of the coach, as well as the interpersonal approach and sense of connectedness.

With regards to the black and white athletes, no significant differences emerged. Taken as a whole, notwithstanding the emergence of the particular difference between male and female athletes, the present results of the PLS-SEM multigroup analysis suggest that the pattern of relationships among the variables of the athletes' perceived need-supportive leadership, autonomous motivation, psychological well-being and performance were similar across all groups of athletes.

The current study thus aligns with the substantial body of evidence within SDT which clearly suggests that at the core of all males, females and cultures (collectivistic or individualistic), regardless of apparent cultural and gender differences in values and

practices, are the basic and universal needs to attain optimal motivation, well-being and performance. It is therefore apparent that, regardless of an athlete's gender, culture or developmental phase, if a coach creates a motivational climate in which the athletes' perceived satisfaction of the three basic needs of autonomy, competence and relatedness are promoted, an adaptive environment conducive to enhancing quality motivation and well-being and thus reaching optimal performance can be developed.

Nevertheless, despite this universality, coaches should forever bear in mind that every individual is unique and therefore knowledge, skills and cultural awareness should always be used to increase sensitivity to each individual and context.

In addition, no studies exploring SDT's suggested pattern of relationships across gender and race within the South African sporting context could be located and, in this regard, the present study is considered to make a meaningful contribution to the literature. A major strength of this study is that the sample was drawn from five of the nine provinces in South Africa, thus strengthening the generalisability of the current findings to the South African context.

Finally, the perceived need-supportive leadership, together with the athletes' autonomous motivation and psychological well-being, all significantly impacted performance, accounting for 26% of the variance in the athletes' performance, for the total group. Additional factors, not measured in this study, which could possibly be determinants of athletic performance, include the goals and aspirations of individual athletes, as well as the cohesiveness experienced by the team.

Limitations and Recommendations

This study is subject to various limitations which should be noted. Firstly, self-reported measures were incorporated and, although shown to be valid and reliable, may still be subject to reporting bias. Adapted measures were employed to assess perceived need-

supportive leadership in the context of sport and, while such adaptations are not uncommon in sport-based literature, the extent to which the items are fully representative and relevant to the targeted construct remains undetermined. The measure of performance utilised in this study was also of a subjective nature (self- and coach-ratings of athletes' performance). Thus, in addition to subjective ratings, the attainment of more objective evaluations of the coaches' behaviour and leadership style and the athletes' mental well-being and performance is recommended.

Secondly, the data are correlational in nature and collected at one point in time, which limits the interpretations and inferences with regard to causality and the direction of the processes involved. Longitudinal and experimental studies within the South African context are therefore recommended to examine the hypothesised pattern of relationships in greater depth.

Thirdly, the focus of the current study was to investigate the relevant phenomena in team-sport athletes – a noticeable gap in existing research. However, the present reality of the school sporting arena in South Africa dictates that certain limitations were inherent to the sampling methodology. Although the sample included a variety of adolescents from various cultures and different backgrounds, there was an unequal distribution of the sampling size. An additional limitation is the confound between gender / race and sport type. In the current study, the athletes represented four mainstream team sports played in South Africa at school level, namely soccer and rugby for boys; and hockey and netball for girls. These male sport teams (soccer and rugby) and female sport teams (hockey and netball), however, exhibited sample bias with respect to race.

Fourthly, the current data is limited to adolescent athletes involved in team sports and it would thus be interesting to examine whether the current findings would be applicable to adolescent athletes involved in individual sports.

Lastly, The Sport Motivation Scale (SMS), the measurement scale utilised to gauge the motivation of the athletes in the current study, has demonstrated validity and reliability in multiple studies since its publication in 1995. However, in addition to the significant contributions made by the original version of the scale, the developers found that certain elements of the scale could be improved. Thus, the developers of the scale, together with a panel of experts, have since revised the scale by modifying certain items, improving its structure and therefore increasing the scale's overall performance (Pelletier, Rocchi, Vallerand, Deci & Ryan, 2013). This revision occurred after the completion of the current study. It is suggested that future studies consider a comparison of the original and revised scales.

A final recommendation for future studies, specific to the South African context, would be the inclusion of the measurement of athletes' need satisfaction in conjunction with the variables investigated in the current study.

Conclusion

Since its re-admission into the international sporting arena, there has been a strong increase in the social and cultural importance of sport in South Africa. Despite the fact that South Africa has produced a large number of world-class athletes, it is both necessary and essential to constantly strive to advance the performance levels of both our existing and prospective athletes, in order to sustain and continue achieving success (Lovell, 2005). As stated by South Africa's Department of Sport and Recreation (2012b), it is pertinent to address the range of specialised needs of both the country's athletes and coaches if they are to perform optimally in the world arena. The SRSA further believes that in order for the athletes to be provided with a competitive edge, South Africa needs to ensure that coaches are equipped with knowledge of the most advantageous coaching techniques and developments.

Globally, sport occurs in a culturally diverse setting with heterogeneous participants, yet sport psychology rarely addresses the issues of cultural diversity (Gill, 2007). According to Ram, Starek and Johnson (2004), sport-psychology research rarely includes racially diverse participants, exemplifying a striking void in the literature. This marked gap in research is especially apparent within the South African sporting context. South Africa, as a country, is composed of a mosaic of ethnicities and races and celebrates unity in diversity. Therefore, the present study aimed to contribute not only to filling the hiatus in the South African sport-environment research, but also to advancing the worldview and development of multicultural competencies for sport-psychology practice.

In sport, motivation is recognised as the foundation of performance and achievement and is deemed an essential ingredient for success. A leading determinant of athletic performance is considered to be the type of motivation driving the athletes' behaviour. The self-determination theory has received considerable support across multiple achievement contexts and suggests that the basic principles of this theory can be utilised to advance the motivation, positive development and well-being of athletes in a very hands-on manner. Regardless of gender and cultural differences, SDT believes that a truly self-determined motivational profile exists and that this profile should indeed result in the most positive effect. SDT has received extensive support from studies and research conducted within the sport setting. In harmony with SDT, sport literature has established that there is a consistent relation between the promotion of self-determined forms of motivation and positive cognitive, affective and behavioural outcomes, including an increase in the athletes' level of performance. Furthermore, a longstanding postulate of SDT is that athletes' perceptions of their coaches' leadership style as need-supportive positively facilitate the athletes in obtaining optimal motivational outcomes, in the form of autonomous (self-determined) motivation. SDT clearly suggests that at the core of all males, females and cultures

(collectivistic or individualistic), regardless of apparent cultural and gender differences in values and practices, are the basic and universal needs to attain optimal motivation, well-being and performance. If a coach creates a motivational climate in which the athletes' perceived satisfaction of the three basic needs of autonomy, competence and relatedness are promoted, an adaptive environment conducive to enhancing quality motivation and well-being, which result in the achievement of optimal performance, can be developed. Yet, studies linking SDT-based motivational variables with indicators of performance are sorely lacking within the sport domain (Gillet, Berjot & Gobancé, 2009; Gillet, Vallerand & Rosnet, 2009; Gillet, Vallerand, Amoura & Baldes, 2010; Pope & Wilson, 2012; Ryan & Deci, 2007; Vallerand, 2007). Even more so, empirical work within SDT, relating need-supportive leadership and well-being variables with athletic performance is decidedly scarce. The study of performance is, however, imperative, as it denotes one of the ultimate outcomes in sport. Thus, the purpose of this study was to explore the relationship between perceived need-supportive leadership and the participation motivation, psychological well-being and performance levels of top-achieving South African sporting youth. A major goal of this study was to further our understanding of the implications of a need-supportive coaching style within the South African context and accordingly enlighten the leaders within South African sport to be able to successfully meet the needs of this culturally diverse population.

Guided by the theoretical lens of SDT, the following model of sport performance was proposed. Firstly, the athletes' perceptions of the coaches' behaviour and leadership style, in the form of need-supportive leadership, would positively influence the athletes' self-determined sport motivation. In turn, the athletes' quality of (self-determined / autonomous) motivation experienced would have important implications for their psychological well-being, as indicated by subjective vitality and positive affect. Furthermore, this perceived need-supportive leadership style was also expected to have a direct beneficial impact on the

level of psychological well-being experienced by the athletes. An exploratory stance was taken with respect to the relation between perceived need-supportive leadership and the poorer quality (controlled) motivation variable. Controlled motivation was further expected to have a negative influence on the athletes' psychological well-being. Finally, it was anticipated that the athletes' quality of motivation and psychological well-being would both be related to the performance displayed by the athletes. In the current study, the performance-based outcome pertained to a differentiated assessment of the athletes' performance. This measure was obtained by the inclusion of both a self- and coach-rating. A significant correlation (small effect size) emerged between the self- and coach-rating variables, showing that the perceptions of the individual athletes were related to the coaches' perceptions of performance. The results from the structural equation modelling analyses were supportive of the hypothesised model and proposed pattern of sequences, revealing that all hypothesised paths were significant.

The findings emphasised the importance of the quantity and quality of performance feedback provided by the coaches; the expression of empathy by the coaches in acknowledging, understanding and regarding the choices, views, thoughts and feelings of the athletes; the processes utilised in decision-making; and the relationships coaches establish with the athletes, for athletes to train and perform at their finest and function at an optimal physical and psychological level. The results further intimated that athletes experience a boost in their energy, together with yielding the most positive psychological outcomes, when involved in activities (under the leadership of the coach) that are conducive to them experiencing feelings of being capable and effective; the perception of control and that their behaviour is self-chosen; as well as feeling secure and connected with the coach. In conjunction, the findings of this study align with SDT, as it was established that the perceived interpersonal approach of the coach is an antecedent for the processes underlying the link

between self-determination and well-being (increased vitality, more positive affect and satisfaction) amongst the athletes. As suggested by SDT, certain socio-environmental contexts (e.g. the coaching climate) may foster or hinder psychological need satisfaction and, in turn, motivation and well-being. Moreover, these outcomes may also serve as contributors to enhanced behavioural outcomes, namely performance. Hence, it would seem that the need-support of the coach is a key determinant in the performance of athletes and it is thus vital for the coach to pay attention to the manner in which the training sessions are structured, conducted and presented, as well as the interpersonal approaches that occur.

To date, no studies have explored SDT's suggested pattern of relationships across gender and race within the South African sporting context. Therefore, a further focus of this research was to test whether the pattern of relationships among athletes' perceived need-supportive leadership, autonomous motivation, psychological well-being and performance was similar for diverse groups of athletes. In this regard, the present study is considered to make a meaningful contribution to the literature. SDT's notion of universality held true for the models fitted to the gender and racial groups. Nevertheless, despite this universality, coaches should forever bear in mind that every individual is unique and therefore knowledge, skills and cultural awareness should always be used to increase sensitivity to each individual and context.

The data and results articulated herein demonstrate that coaches should be educated in and take time to understand the motivation process and the impact of their behaviour / leadership on athletes' self-determined motivation. In modifying their approaches to align with the need-supportive principles of SDT, the coaches will not only enhance the self-determined motivation, psychological well-being and performance of their athletes, but also possess a competitive edge.

In addition to contributing to the literature, ultimately, it is envisaged that the present study will enlighten the leaders within South African sport to be able to successfully meet the needs of this culturally diverse population and inform a possible platform from which future intervention programmes can be launched.

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APPENDIX A

Athlete Questionnaires

Dear Athlete

Thank you for taking time to complete this questionnaire. Our goal is to find out whether the sportsmen and women of our country are being given all the opportunities needed to reach their full potential. Your school has been identified as one of the top sport schools of South Africa, which, as a 1st or 2nd team athlete, makes you one of our top sport achievers. As a top sport achiever of South Africa, your opinion and experience is of vital importance to us and you would be contributing to the improvement of sport psychology in our country.

Each participating school will be provided with a copy of the final results. These could be made available to you, upon request.

Please take note of the following while completing this questionnaire:

- Please read all instructions carefully at every section. Each question must be answered by circling the number which you think best describes how you feel.
- Please answer honestly. There are no right or wrong answers, only your personal feelings and experiences count.
- I assure you that all the information you give me will be kept confidential and will only be handled by myself. No teachers or coaches will be allowed to see your answers.
- It should take you approximately 30 minutes to complete this questionnaire.
- Should there be something you do not understand, please feel free to ask me any questions.

Thank you and good luck for your future within your sport!

BIOGRAPHICAL INFORMATION

Name & Surname:	
School:	
Date of Birth:	
Age:	Years Months
Gender:	☐ Male ☐ Female
Race:	☐ Black ☐ White
Sport practiced:	☐ Rugby ☐ Football (soccer)
On what level are you participating:	☐ School 1st Team ☐ School 2nd Team
Name of head coach:	

COACHING STYLE

*Your coach trains you in a certain manner. The following questions are about how you view and experience your coach. Please answer these questions with your school coach in mind and not any outside coaches you may have. Please note that the statements vary from **1 (NOT AT ALL TRUE)** to **5 (VERY TRUE)**.*

	Not at all true	Not true	Neutral	True	Very true
1. I feel that my coach provides me with choices and options	**1**	**2**	**3**	**4**	**5**
2. My coach makes me feel better about myself after discussing my problems with him/her	**1**	**2**	**3**	**4**	**5**
3. My coach does not seem to care much for the things I think are important	**1**	**2**	**3**	**4**	**5**
4. If there is something I cannot do or achieve regarding an exercise or instruction, my coach seeks alternative methods to help me succeed	**1**	**2**	**3**	**4**	**5**
5. My coach often smiles at me	**1**	**2**	**3**	**4**	**5**
6. My coach is often willing to see things from my point of view	**1**	**2**	**3**	**4**	**5**
7. My coach makes the effort to ensure that I feel better about myself when I have a bad day	**1**	**2**	**3**	**4**	**5**
8. When possible, my coach allows me to choose what I would like to do	**1**	**2**	**3**	**4**	**5**
9. My coach often enjoys doing activities with me	**1**	**2**	**3**	**4**	**5**
10. My coach allows me to make my own decisions regarding the things I do	**1**	**2**	**3**	**4**	**5**
11. My coach attempts to cheer me up when I am sad	**1**	**2**	**3**	**4**	**5**
12. My coach allows me the space to work some things out for myself	**1**	**2**	**3**	**4**	**5**
13. My coach shows me how I can train independently	**1**	**2**	**3**	**4**	**5**
14. My coach pays attention to and cares for me	**1**	**2**	**3**	**4**	**5**
15. My coach wants everything to be done his/her way	**1**	**2**	**3**	**4**	**5**
16. My coach makes sure that I have completed / can do a certain activity / programme before we move onto something new	**1**	**2**	**3**	**4**	**5**
17. My coach feels it is important to show me that he/she really wants me in his/her training group	**1**	**2**	**3**	**4**	**5**
18. My coach provides me with positive feedback on a regular basis	**1**	**2**	**3**	**4**	**5**
19. I feel a sense of understanding from my coach, regarding my way of doing things	**1**	**2**	**3**	**4**	**5**
20. My coach often gives me encouragement and a pat on the back	**1**	**2**	**3**	**4**	**5**
21. My coach conveys confidence in my ability to do well in my sport	**1**	**2**	**3**	**4**	**5**

	Not at all true	Not true	Neutral	True	Very true
22. My coach acknowledges the fact that I have the capabilities to complete an activity to the best of my ability	**1**	**2**	**3**	**4**	**5**
23. My coach has faith in my ability to grow	**1**	**2**	**3**	**4**	**5**
24. My coach only continues with training once he/she sees I have mastered the previous activity	**1**	**2**	**3**	**4**	**5**
25. My coach acknowledges my manner of tackling activities and doing things	**1**	**2**	**3**	**4**	**5**
26. My coach encourages me to ask questions	**1**	**2**	**3**	**4**	**5**
27. My coach encourages me to take initiative	**1**	**2**	**3**	**4**	**5**
28. My coach considers my views regarding my sport, before suggesting how things should be done	**1**	**2**	**3**	**4**	**5**

MOTIVATION

*Using the scale, please indicate to what extent each of the following statements corresponds to one of the reasons why you are presently practicing your sport. Please note that this is now a **7-point scale**, ranging from **1 (DOES NOT CORRESPOND AT ALL)** to **7 (CORRESPONDS EXACTLY)**.*

	Does not correspond at all		**Corresponds moderately**			**Corresponds exactly**	
1. For the pleasure I feel in having exciting experiences	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2. For the pleasure it gives me to know more about the sport that I practice	**1**	**2**	**3**	**4**	**5**	**6**	**7**
3. I used to have good reasons for doing this sport, but now I am wondering if I should continue doing it	**1**	**2**	**3**	**4**	**5**	**6**	**7**
4. For the pleasure of discovering new training techniques	**1**	**2**	**3**	**4**	**5**	**6**	**7**
5. I don't know anymore, I have the feeling that I am incapable of succeeding at this sport	**1**	**2**	**3**	**4**	**5**	**6**	**7**
6. Because it allows me to be admired by people I know	**1**	**2**	**3**	**4**	**5**	**6**	**7**
7. Because, in my opinion, it is one of the best ways to meet people	**1**	**2**	**3**	**4**	**5**	**6**	**7**
8. Because I feel a lot of personal satisfaction when mastering certain difficult training techniques	**1**	**2**	**3**	**4**	**5**	**6**	**7**
9. Because it is absolutely necessary to do sport if one wants to be in shape	**1**	**2**	**3**	**4**	**5**	**6**	**7**
10. For the prestige of being an athlete	**1**	**2**	**3**	**4**	**5**	**6**	**7**
11. Because it is one of the best ways to develop other aspects of myself	**1**	**2**	**3**	**4**	**5**	**6**	**7**
12. For the pleasure I feel while improving some of my weak points	**1**	**2**	**3**	**4**	**5**	**6**	**7**
13. For the excitement I feel when I am really involved in the activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**
14. Because I must do sport in order to feel good about myself	**1**	**2**	**3**	**4**	**5**	**6**	**7**
15. For the satisfaction I experience while I am perfecting my abilities	**1**	**2**	**3**	**4**	**5**	**6**	**7**
16. Because people around me think it is important to be in shape	**1**	**2**	**3**	**4**	**5**	**6**	**7**
17. Because it is a good way to learn lots of things which could be useful to me in other areas of my life	**1**	**2**	**3**	**4**	**5**	**6**	**7**
18. For the intense emotions that I feel while I am doing a sport that I like	**1**	**2**	**3**	**4**	**5**	**6**	**7**
19. It is not clear to me anymore; I don't really think I have a place in sport	**1**	**2**	**3**	**4**	**5**	**6**	**7**
20. For the pleasure that I feel while performing difficult movements	**1**	**2**	**3**	**4**	**5**	**6**	**7**

	Does not correspond at all		Corresponds moderately			Corresponds exactly	
21. Because I would feel bad if I was not taking time to do it	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22. To show others how good I am at my sport	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23. For the enjoyment that I feel while learning new training techniques that I have never tried before	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24. Because it is one of the best ways to maintain good relationships with my friends	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25. Because I like the feeling of being totally involved in the activity	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26. Because I must do sport regularly	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27. For the pleasure of discovering new performance strategies	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28. I often wonder why, I can't seem to achieve the goals that I set for myself anyway	**1**	**2**	**3**	**4**	**5**	**6**	**7**

EMOTIONS

*Please indicate, in your opinion, to what extent you think the following statements are **not at all true / very true**, on this 5-point scale:*

	Not at all true	Not true	Neutral	True	Very true
1. During the past few weeks I have been very alert while participating in my specific sport	**1**	**2**	**3**	**4**	**5**
2. During the past few weeks I have felt alive and vital while participating in my specific sport	**1**	**2**	**3**	**4**	**5**
3. During the past few weeks I have felt energized while participating in my specific sport	**1**	**2**	**3**	**4**	**5**
4. During the past few weeks I have felt so alive and energetic while participating in my specific sport, that I just wanted to burst	**1**	**2**	**3**	**4**	**5**
5. During the past few weeks I have felt full of energy and spirit while participating in my specific sport	**1**	**2**	**3**	**4**	**5**
6. During the past few weeks I have felt a lack of energy while participating in my specific sport	**1**	**2**	**3**	**4**	**5**
7. During the past few weeks I have looked forward to each new day	**1**	**2**	**3**	**4**	**5**

*Please indicate to what extent **you have experienced these specific emotions** during the past few weeks:*

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
Enthusiastic	**1**	**2**	**3**	**4**	**5**
Interested	**1**	**2**	**3**	**4**	**5**
Determined	**1**	**2**	**3**	**4**	**5**
Joyful	**1**	**2**	**3**	**4**	**5**
Active	**1**	**2**	**3**	**4**	**5**
Confident	**1**	**2**	**3**	**4**	**5**
Bold	**1**	**2**	**3**	**4**	**5**
Attentive	**1**	**2**	**3**	**4**	**5**
Inspired	**1**	**2**	**3**	**4**	**5**
Alert	**1**	**2**	**3**	**4**	**5**

DEVELOPMENT

Please take the following guidelines into account whilst completing this section:

- *Evaluate your development over the past year.*
- *Evaluate your development by taking your talents and potential into account. It is therefore about the expectations you had of yourself in the beginning of the season and to what degree you have performed accordingly.*
- *It is important that you do not take the opinions of external people into account whilst completing this evaluation, the evaluation should remain subjective (your opinion).*
- *Evaluate yourself according to the following five components: **technical** level; **tactical** level; **physical** level; **psychological** level and **overall** development.*

Using the scale below, please fill in the appropriate corresponding number in the following table:

1	***2***	***3***	***4***	***5***
No development (0% to 15%)	*Poor development (16% to 35%)*	*Average development (36% to 65%)*	*Above average development (66% to 85%)*	*Excellent development (86% to 100%)*

Technical: Domain-specific fundamental knowledge; skill; co-ordination

Tactical: Positioning and deciding; Knowing about ball actions; Knowing about others; Acting in changing situations

Physical: Speed; Strength; Endurance (aerobic, anaerobic, muscle)

Psychological: Motivation; Goal-Setting; Confidence; Thought Control; Stress and Time Management; Pre-Competition Preparation; Concentration; Coping Skills

Technical	Tactical	Physical	Psychological	Overall

PERFORMANCE

Please take the following guidelines into account whilst completing this section:

- *Evaluate your performance in comparison with the other athletes within your school team.*
- *Please do not take your potential into account, as was the case in part one.*
- *Evaluate yourself according to an overall, subjective (your opinion) view of your performance.*

Using the scale below, please circle the appropriate corresponding number in the following table:

1 *Much weaker performance*	***2*** *Somewhat weaker performance*	***3*** *Same level*	***4*** *Somewhat stronger performance*	***5*** *Much stronger performance*

Overall Performance				
1	**2**	**3**	**4**	**5**

APPENDIX B

Coach Questionnaires

Dear Coach

Thank you for taking time to complete this questionnaire. My research focus is upon the effect of need supportive leadership on the psychological well-being, motivation and performance of adolescent sport achievers in South Africa. Through this study, I wish to make a contribution to a field sorely in need of further research within the South African context. This is critical if the domain of sport psychology is to be successful in advancing beyond current knowledge and boundaries. Results of this study may lead to enhanced interventions and developmental strategies to benefit all South African youth at school level.

I would appreciate it if you would please assist me with my study by evaluating the performance of your first and second team athletes, who have also completed questionnaires. Please note that all information provided will be regarded as **strictly confidential** and will only be handled by myself. No names or answers will be made available to any other persons.

The evaluation is divided into two parts:

- **Part one** is dedicated to evaluating each athlete on an intra-personal level (personal development and performance)
- **Part two** is dedicated to evaluating each athlete on an inter-personal level (comparing their development and performance to that of the other athletes).

Thank you for your time and willingness to participate!

Name & Surname:		
School:		
Sport:	☐ Rugby	☐ Football (soccer)
	☐ Hockey	☐ Netball

PART 1: DEVELOPMENT

Please take the following guidelines into account whilst completing this section:

- Evaluate the development of the athletes over the past year.
- Evaluate the development of the athletes by taking their talents and potential into account. It is therefore about the expectations you have of these people in the beginning of the season and to what degree they have performed accordingly.
- It is important that you do not take the opinions of external people into account whilst completing this evaluation, the evaluation should remain subjective (your opinion as coach).
- Evaluate the athletes according to the following five components: **technical** level; **tactical** level; **physical** level; **psychological** level and **overall** development.

Using the scale below, please fill in the appropriate corresponding number in the following table:

1 No development (0% to 15%)	**2** Poor development (16% to 35%)	**3** Average development (36% to 65%)	**4** Above average development (66% to 85%)	**5** Excellent development (86% to 100%)

Technical: Domain-specific fundamental knowledge; skill; co-ordination

Tactical: Positioning and deciding; Knowing about ball actions; Knowing about others; Acting in changing situations

Physical: Speed; Strength; Endurance (aerobic, anaerobic, muscle)

Psychological: Motivation; Goal-Setting; Confidence; Thought Control; Stress and Time-Management; Pre-Competition Preparation; Concentration; Coping Skills

Name of athlete	Technical	Tactical	Physical	Psychological	Overall
1.					

PART 2: PERFORMANCE

Please take the following guidelines into account whilst completing this section:

- Evaluate the performance of the athletes in comparison with the other athletes within their sport category.
- Please do not take the athlete's potential into account, as was the case in part one.
- Evaluate the athletes according to an overall, subjective (your opinion) view of their performance.

Using the scale below, please circle the appropriate corresponding number in the following table:

1 Much weaker performance	**2** Somewhat weaker performance	**3** Same level	**4** Somewhat stronger performance	**5** Much stronger performance

Name of athlete	**Overall Performance**				
1.	**1**	**2**	**3**	**4**	**5**

Summary

Internationally, sport has become a profession and the desire for success has resulted in sporting professionals constantly searching for means to enhance performance levels. Despite the fact that South Africa has produced a large number of world-class athletes, it is both necessary and essential to constantly strive to advance the performance levels and consistency of both our existing and prospective athletes, in order to sustain and continue achieving success at the elite level. The collective theory and research reviewed in this study have clearly indicated that the perceptions, level of motivational orientations and psychological well-being of athletes explain and predict their performance within their sport. In addition, these psychological characteristics are significantly affected by the leadership style exhibited by the coach. Thus, in order to gain a more accurate and comprehensive interpretation of athletes' sporting behaviour, the socio-environmental influences need to be taken into account. As a core objective of self-determination theory is to grasp the effect of the social environment on an individual's motivation, well-being, affect and behaviour, it was the theory of choice in providing a conceptual framework for the current study.

The purpose of this study was to explore the relationships between perceived need-supportive leadership (as a core socio-environmental influence) and the participation motivation, psychological well-being and performance levels of South African top achieving sporting youth. Firstly, relationships were tested between perceived need-supportive leadership and athletes' motivation, psychological well-being and self- and coach-rated performance. Secondly, the accuracy of a theoretical model, depicting that athletes' perceived need-supportive leadership of the coach leads to enhanced motivation, psychological well-being and heightened performance, was determined. Thirdly, was the investigation of meaningful differences with respect to the athletes' perceived need-supportive leadership, motivation, psychological well-being and performance variables across gender and race.

A non-experimental, cross-sectional survey research design utilising self-report measures was selected to investigate the various factors at hand. The total sample consisted of 453 team-sport athletes, recruited from four athletic teams (mean age = 17.3 years), and 33 coaches. The athletes comprised both genders, male (mean age = 17.5 years) and female (mean age = 17.1 years) and two main racial groups, black (mean age = 17.1 years) and white (mean age = 17.4 years). The coaches were representative of both genders and both black and white racial groups.

Pearson's correlation coefficients (*r*) were computed to determine the correlations between athletes' perceived need-supportive leadership and motivation; psychological well-being; and performance. A non-directional, two-tailed test of significance was applied, largely confirming the hypotheses that perceived need-supportive leadership is positively related to an increase in the athletes' autonomous motivation (medium effect sizes), psychological well-being (small to medium effect sizes) and self- and coach-rated personal performance (small to medium effect sizes). The partial least squares (PLS) approach to structural equation modelling (SEM) was utilised in evaluating the results relating to the process or paths depicting the variables influencing optimal performance. The conceptual model with its hypothesised paths indicated significant path coefficients and explained 26% of the variance in performance, for the total group of athletes. In determining significant differences between the path coefficients of the gender and racial groups, a PLS-SEM multigroup analysis (PLS-MGA) was executed for comparing the PLS-SEM model estimates of each group. In general, SDT's notion of universality held true for the models fitted to the gender and racial groups. Unique to this study, however, was the finding of gender differences in the pathway between perceived coaching style and autonomous motivation, reflecting a stronger influence for the female group and thus suggesting that female athletes' autonomous motivation is more strongly influenced by the coaches' perceived coaching-style

than is the case for their male counterparts. A perceived need-supportive leadership style may thus be regarded as an important impetus for enhancing quality motivation and psychological well-being and thus promoting optimal performance.

Key Terms

Perceived need-support; coaching effectiveness; psychological well-being; motivation in sport; athletic performance; adolescent athletes; self-determination; coaches' leadership style; gender differences; race differences.

Opsomming

Sport het internasionaal ‘n professionele beroep geword, wat meebring dat professionele atlete voortdurend na wyses streef om hul sukses en prestasievlakke te verbeter. Alhoewel Suid-Afrika ‘n groot aantal wêreldklas atlete geproduseer het, is dit beide nodig en noodsaaklik om voortdurend na die bevordering en volharding van huidige en voornemende atlete se prestasievlakke te streef, en sodoende sukses op elite vlak voort te sit en te onderhou. Die gemeenskaplike teorie en navorsing wat in dié studie hersien is, wys duidelik daarop dat atlete se persepsies, vlak van motiverende oriëntasies en psigologiese welstand hul prestasie in hul spesifieke sportkode kan verklaar en voorspel. Daarbenewens word die bogenoemde psigologiese eienskappe betekenisvol beïnvloed deur die leierskapstyl wat deur ‘n afrigter gevolg word. Sodoende, om ‘n akkurater en omvattende interpretasie van atlete se sportgedrag te verkry vereis ook dat sosio-omgewingsinvloede in ag geneem word. Gevolglik, is die self-determinasie teorie (SDT) as konseptuele raamwerk vir die huidige studie gebruik weens dié teorie se kern doelstellings, wat beoog om die impak van sosiale omgewings op ‘n individu se motivering, welstand, affek en gedrag te ondersoek en te beskryf.

Die doelwit van die studie was om die verwantskap tussen waargenome behoefte-ondersteunende leierskap (as ‘n kern sosio-omgewingsinvloed) en deelname motivering, psigologiese welstand en prestasievlakke van top Suid-Afrikaanse jeug-atlete te ondersoek. Eerstens, is die verwantskappe tussen waargenome behoefte-ondersteunende leierskap en atlete se motivering, psigologiese welstand en graderings van self- en afrigterprestasie bepaal. Tweedens, is die akkuraatheid van ‘n teoretiese model bepaal, wat voorstel dat waargenome behoefte-ondersteunende leierskap tot verbeterde motivering, psigologiese welstand, en verhoogde prestasie lei. Derdens, is beduidende verskille ten opsigte van waargenome

behoefte-ondersteunende leierskap soos deur atlete beskou, en motivering, psigologiese welstand,en prestasie veranderlikes oor geslag en ras heen ondersoek.

‘n Nie-eksperimentele, deursnee ontwerp opname, wat van self-gerapporteerde metings gebruik maak, is geselekteer om die verskeie faktore te ondersoek. Die totale steekproef het uit 453 spansport-atlete bestaan en is vanuit vier atletiese spanne (gemiddelde ouderdom = 17.3 jaar) en 33 afrigters gewerf. Die steekproef het beide manlike atlete (gemiddelde ouderdom = 17.5 jaar) en vroulike atlete (gemiddelde ouderdom = 17.1 jaar) ingesluit, sowel as twee rasgebonde groepe bestaande uit hoofsaaklik swart (gemiddelde ouderdom = 17.1 jaar) en blanke (gemiddelde ouderdom = 17.4 jaar) atlete. Die afrigters was verteenwoordigend van beide geslagte en rassegroepe.

Pearson se korrelasie-koëffisiënt (r) is bereken om sodoende die korrelasies tussen atlete se waargenome behoefte-ondersteunende leierskap en motivering; psigologiese welstand; en prestasie te bepaal. ‘n Nie-rigtinggewende, twee-kantige toets vir beduidendheid is toegepas, wat grootliks die hipoteses dat behoefte-ondersteunende leierskap positief korreleer met ‘n toename in ‘n atleet se outonome motivering (medium effek goottes), psigologiese welstand (klein tot medium effek groottes) en self- en afrigterprestasie graderings (klein tot medium effek grootte) bevestig. Die parsiële kleinste kwadrante (PLS) benadering tot strukturelevergelyking-modellering (SEM) is gebruik om die verbandhoudende resultate tot die proses of roete van veranderlikes, wat optimale prestasie beïnvloed, te evalueer. Die voorspelde roetes van die konseptuele model het beduidende baankoëffisiënte getoon en het 26% van die variansie in prestasie vir die totale groep atlete verduidelik. Vir die bepaling van beduidende verskille tussen die baankoëffisiënte van die geslag- en rassegroepe is ‘n PLS-SEM meervoudige groepanalise (PLS-MGA) uitgevoer om die PLS-SEM ramings van elke groep te vergelyk. In die algemeen, is die SDT se opvatting ten opsigte van universaliteit ondersteun vir die modelle wat met die geslag- en rassegroepe

gepaar is. Uniek tot die studie, nietemin, is die bevinding van geslagsverskille in die baan tussen waargenome afrigtingstyl en outonome motivering. Hiervolgens reflekteer die resultate ‘n groter invloed van waargenome afrigterstyl onder die vroulike groep, wat suggereer dat vroulike atlete se outonome motivering in groter mate deur die afrigter se waargenome afrigterstyl beïnvloed word in vergelyking met hul manlike eweknieë. ‘n Behoefte-ondersteunende leierskap styl kan dus as ‘n belangrike aandrif vir die verhoging van motivering kwaliteit en psigologiese welstand beskou word, en daarom optimale prestasie bevorder.