EMOTIONAL INTELLIGENCE IN SPORT:
A PREDICTOR OF RUGBY PERFORMANCE

by

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SUMMARY

A study was conducted on 74 school first- and second-team rugby players from four Pretoria high schools, to investigate whether start-up A-team players differ significantly from other (B-team start-up and reserve) players on emotional intelligence. It was further investigated whether emotional intelligence is a predictor of rugby performance if measured as being included into the study's 'best team' or being a start-up A-team school rugby player. Various other physical, psychological, social and spiritual predictors were also investigated singularly and in combination with the emotional intelligence predictor to indicate performance. Data were gathered through a self-reporting questionnaire developed by the researcher. The main methods for analysing data used included the Mann-Whitney Test and the Logistic Regression analysis. The study found certain spiritual and social predictor aspects to be significantly related to performance in rugby but not emotional intelligence. Certain underlying emotional aspects where more significant to the study's B-team players' performance.

Keywords: Emotional; emotional intelligence; demographical, physical, psychological, social and spiritual aspects; high school rugby; logistic regression; odds; rugby performance; team inclusion; team standing

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

1.1.1 The history of rugby

There is a mythological belief that rugby started through the inspiration of a young boy named William Webb Ellis, who during a game of football, took up the ball in his hands and started running with it. This took place as far back as 1823 at Rugby School in the Midlands of England (South African Rugby Football Union, 1995). No rules forbidding the players to touch the ball with their hands then existed, and the Football Association only forty years later established it as a rule in soccer. Breaking away from this rule by accepting the play of the ball by hand, the Rugby Football Union was then established. Rugby was born and then transpired to the rest of the world through the British Empire to countries such as France, South Africa, and Canada from where it also spread further to Argentina, New Zealand, the Pacific Islands, Japan and Australia. Rugby was played for various reasons such as establishing of unity after wars and originally only the preserve of men (South African Rugby Football Union, 1995). Currently, it is played for reasons such as entertainment and reconciliation, and also played by women. Professional sportsmen and sportswomen participate in rugby, which is presently recognised all over the world as a very popular professional sport. Every four years selected national men's rugby teams from around the world compete for the Rugby World Cup Webb-Ellis trophy.

1.1.2 Contextualizing rugby in South Africa

Rugby is characterised by international and local competitions. International competitions include tests played between countries' national teams and yearly competitions such as the Vodacom Tri Nations competition played in the Southern Hemisphere between the national teams of Australia, New Zealand and South Africa.

In South Africa, local rugby teams compete against one another for the ABSA Curry Cup and Vodacom Cup. Local rugby teams from South Africa further compete internationally against local rugby teams from Australia and New Zealand in the yearly Vodacom Rugby Super 14 competition. These premiership level competitions set the stage for young aspirant rugby players of each country to prove themselves and be selected for inclusion into the national rugby team of their country.

The players of the local rugby teams are identified and selected from various rugby clubs, universities, and even school teams. National rugby competitions for clubs, universities, and schools exist throughout South Africa. Annually, the top club rugby teams compete in the National Club Championships competition, the eight top university rugby teams compete for the First National Bank Varsity Cup and school teams compete during the Craven Week Schools competition.

Rugby competitions can be very demanding in as far as players could be exposed to many games during a year. For instance, professional rugby players may start the year playing for a team in the Vodacom Rugby Super 14 competition (which is played between February and May each year) by playing in thirteen games against other teams, with a possible additional semi-final and final game. Thereafter, a player may play in a few international test games as well as the six Vodacom Tri Nations games and then play in ten to twelve ABSA Curry Cup games, while ending-off the year playing in a further four international test games. It could therefore be understood that although a great physical demand is placed on a rugby player, psychological and emotional demands could be just as, or even more, strenuous.

1.1.3 Discipline in rugby

Rugby competitions have to adhere to strict rules. Although these rules may be annually revised, adapted and changed they are determined and governed by the various professional rugby boards and panels of experts striving to ensure fairness, unity, safety as well as flowing of the game. Discipline refers to the adherence of players to the rules of the sport. Sportsmanship and

consideration for other players, spectators, and officials of the game are also at the order of the day, as rugby remains a game mainly played for entertainment.

During rugby competitions, penalties (which might be further enhanced with yellow and/or red cards) are issued for ill-disciplined behaviour or offensive play (Wikipedia, The Free Encyclopedia, 2009a). A penalty may cost a team points or field distance, once the opposing team has kicked the ball out, and is awarded the advantage of throwing in the ball at the lineout. A yellow card indicates the player receiving it is to be temporary suspended from the game for a period of ten minutes and a red card issued to a player indicates (permanent) suspension for the remainder of the game. A penalty is always rewarded to the opposing team following the issuing of yellow or red cards to a player of a team. It is clear, therefore, that during a rugby match, players are to behave in a disciplined manner according to the rules, as actions contradictory to the rules of the game could be costly to the individual player as well as the team.

Penalties are given during a game for various reasons. Several penalties being awarded may be viewed as 'genuine' mistakes made by players (due to lack of concentration and proper judgment at that point of the game, differences concerning interpretation of the rules) and perhaps as mistakes made by the referee. Examples of penalties given in rugby include being off-side, entering the ruck or maul from the side, collapsing the scrum and failing to release a tackled player or failing to release the ball after being tackled. Many penalties, however, are issued against deliberate actions, foul or violent play and lack of (emotional) control. Examples in this case would be: a) penalties issued against players for a dangerous tackle that could result in injury such as tackling another player in the air, above the shoulders, or without the use of the arms; b) charging in on another player with the shoulder(s); c) punching, elbowing, kicking, head-butting or tripping opponents; d) contesting or dissenting against a referee's decision including the use of abusive language or conduct towards officials; or e) any other actions contrary to good sportsmanship (Wikipedia, The Free Encyclopedia, 2009a). It seems, therefore, that many penalties in rugby could be avoided, if proper control over certain actions and emotions of rugby players could be found and maintained during games.

Rugby matches are characterised by player transgressions and punishment thereof by the referee issuing penalties, yellow and/or red cards. Penalties could either lead to scoring more points by the team awarded the penalty through the conversion of a penalty kick at posts; or to field advantage by kicking the ball up-field into touch and maintaining the throw-in at the lineout.

1.1.4   Rugby World Cup (RWC) and Vodacom Rugby Super 14 statistics

During the RWC 1995 and 2003 a total of 155 and 206 penalties each were issued and converted into 465 and 618 points respectively (see Tables 1.1 and 1.2)[1]. Penalties accounted for 27% of the total 1730 points scored by all teams during 1995 and 22% of the 2835 points scored during 2003 (International Rugby Board, 2010b; Wikipedia, The Free Encyclopedia, 2009b; Wikipedia, The Free Encyclopedia, 2009c).

In 1995, the team either with the highest or second highest total converted penalties count during the pool games, played in the quarterfinals. During the quarter- and semi-finals it seemed as if a team had a 50% chance of going through to the next round in terms of penalties converted. The teams during the final, and third and fourth place play-off games had fairly high but equal penalty conversion counts (three each). Finally, the teams with the highest converted penalty count at the end of the competition between the two teams competing in the final two games of the RWC (final, and third and fourth place play-off games) were also the teams winning these games.

In 2003, again, the team either with the highest or second highest total converted penalties count during the pool games, played in the quarterfinals. During the quarterfinals, all four teams having the most penalties converted, advanced to the semi-finals. The final had a fairly high but equal count of penalties converted (five each per team), while the team with the least penalties converted, won the third and fourth place play-off game. During the final game, from the two teams competing against one another, the team with the highest overall penalty conversion count accumulated during that year's RWC (including those of the final game), was also the winning team.

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[1] A converted penalty is worth 3 points in rugby

Table 1.1 Rugby World Cup 1995: Penalties converted per team and standings

Pool	Number	Team name	Standing in pool	Total penalties converted	Penalties converted during quarter-finals (result)	Penalties converted during semi-finals (result)	Penalties converted during final and 3rd/4th play-offs (standing)	Total penalties converted in RWC	Final standing at end of RWC
A	1	South Africa	1	**9**	2 (Win)	**4 (Win)**	3 (1st)	**18**	**1**
	2	Australia	2	3	**5 (Lose)**			8	5
	3	Canada	3	**5**				5	6
	4	Romania	4	4				4	7
B	5	England	1	**12**	**5 (Win)**	1 (Lose)	3 (4th)	**21**	**4**
	6	Western Samoa	2	**7**	0 (Lose)			7	5
	7	Italy	3	7				7	6
	8	Argentina	4	7				7	7
C	9	New Zealand	1	**8**	2 (Win)	1 (Win)	3 (2nd)	**14**	**2**
	10	Ireland	2	2	**4 (Lose)**			6	5
	11	Wales	3	**8**				8	6
	12	Japan	4	1				1	7
D	13	France	1	**10**	**8 (Win)**	**5 (Lose)**	3 (3rd)	**26**	**3**
	14	Scotland	2	**14**	3 (Lose)			17	5
	15	Tonga	3	2				2	6
	16	Ivory Coast	4	4				4	7
TOTAL				103	29	11	12	**155**	

Information obtained from http://en.wikipedia.org/wiki/1995_Rugby_World_Cup

It seems like in the most cases the teams with the highest or second highest total penalties converted during the pool stages of the RWC games mentioned, have a better chance of: a) ending at the top of the pool; b) going through to the quarter-finals; c) winning the semi-finals; and d) being the winning team of the RWC in terms of total overall penalties converted during this competition!

Table 1.2   Rugby World Cup 2003: Penalties converted per team and standings

Pool	Number	Team name	Standing in pool	Total penalties converted	Penalties converted during quarter-finals (result)	Penalties converted during semi-finals (result)	Penalties converted during final and 3rd/4th play-off (standing)	Total penalties converted in RWC	Final standing at end of RWC
A	1	Australia	1	**8**	**4 (Win)**	**5 (Win)**	4 (2nd)	**21**	**2**
	2	Ireland	2	**9**	0 (Lose)			9	5
	3	Argentina	3	6				6	6
	4	Romania	4	5				5	7
	5	Namibia	5	0				0	8
B	6	France	1	**16**	**5 (Win)**	0 (Lose)	1 (4th)	**22**	**4**
	7	Scotland	2	11	2 (Lose)			13	5
	8	Fiji	3	**12**				12	6
	9	USA	4	9				9	7
	10	Japan	5	**12**				12	8
C	11	England	1	**8**	**6 (Win)**	**5 (Win)**	4 (1st)	**23**	**1**
	12	South Africa	2	4	3 (Lose)			7	5
	13	Samoa	3	**8**				8	6
	14	Uruguay	4	6				6	7
	15	Georgia	5	**12**				12	8
D	16	New Zealand	1	2	**3 (Win)**	1 (Lose)	0 (3rd)	**6**	**3**
	17	Wales	2	**11**	0 (Lose)			11	5
	18	Italy	3	**14**				14	6
	19	Canada	4	9				9	7
	20	Tonga	5	1				1	8
TOTAL				163	23	11	9	**206**	

Information obtained from http://en.wikipedia.org/wiki/2003_Rugby_World_Cup

The Vodacom Rugby Super 14 competition has also been characterised by many penalties, as well as yellow and red cards over the past four years. In 2007, 431 penalties were successfully kicked and led to 1293 points (Super 14, 2009). After week 10 of the competition in 2008, 770 penalties were conceded and by the end of the year, 297 of the total penalties were converted into

891 points. By week 6 of the 2009 Super 14 contest, already 406 penalties were awarded. Many yellow and red cards have been issued during this competition (see Table 1.3).

Table 1.3   Vodacom Super 14: 2006-2009: Yellow and red cards received per team

No	Team	Yellow cards					Red cards				
		2006	2007	2008	2009	Total	2006	2007	2008	2009	Total
1	Blues	2	3	3	2	**10**					**0**
2	Brumbies	2	3	4	3	**12**					**0**
3	Bulls	3	4	11	6	**24**			1	1	**2**
4	Cheetahs	5	2	6	8	**21**					**0**
5	Chiefs	1	6	4	3	**14**			1		**1**
6	Crusaders	2	2	5	5	**14**					**0**
7	Highlanders	5	4	10	4	**23**				1	**1**
8	Hurricanes	3	7	6	7	**23**			1		**1**
9	Lions/Cats	1	5	6	9	**21**	1				**1**
10	Reds	5	10	6	4	**25**		2			**2**
11	Sharks	2	3	4	5	**14**			1	1	**2**
12	Stormers	4	5	4	2	**15**					**0**
13	Warathas	1	1	2	4	**8**					**0**
14	Western Force	1	5	3	0	**9**					**0**
TOTAL		**37**	**60**	**74**	**62**	**233**	**1**	**2**	**4**	**3**	**10**

Information obtained from http://www.super14.com/stats/

In 2007, the referees for ill-disciplined play issued 60 yellow cards compared to 37 in 2006. The total of the same cards for 2008 was 74 and for 2009, 62 cards were issued. Since 2006 to 2009, ten red cards have been allocated for major transgressions. It seems that there was an increase in penalties, yellow and red cards in this completion from 2006 to 2008, with a slight decrease in 2009.

Although it is still not statistically known how the issuing of penalties and yellow or red cards may directly or indirectly influence the game results, it seems plausible enough to expect that there are disadvantages to having received more penalties against one's team during a game or having to play with less players (in the case of yellow and red cards) for periods of the game. It is

thereby conceivable to search for solutions to reduce ill-disciplined behaviour in a team in order to minimise penalties awarded as a result of such behaviour.

1.1.5 Implication of ill-disciplined behaviour at local competition level

Various types of ill-disciplined behaviour in rugby games such as foul play, off-side play, illegal tackling and rucking, hitting, head-butting and deliberate or repeated infringements are reasons for receiving penalties and yellow or red cards (International Rugby Board, 2010a; Wikipedia, The Free Encyclopedia, 2009a). The issuing of yellow cards for descent (cursing, back chatting, and commenting on decisions made by the referee) had also become more regular, which may be directly related to rugby players' lack of (emotional) control. In a local rugby competition, the 2008 First National Bank Varsity Cup competition, one of the deciding rules for determining the winners of the semi-final matches depended on cards received during the course of the competition. The ruling was that, should the teams' scores be level after full time as well as extra time (an additional twenty minutes of play), the winning team would be appointed according to the least amount of red or yellow cards received during the competition. At all levels of rugby, including school level, penalties, as well as yellow and red cards, are issued for ill-disciplined play, possibly having an effect on the outcome of games.

1.2 THE CURRENT STUDY

1.2.1 Motivation for and aim of the study

The interest in psychological factors contributing to sport performance started over a hundred years ago but it was only about forty years ago that sport psychology became a recognised field of its own (Weinberg & Gould, 2007; Williams & Straub, 2006). Sport psychologists are primarily interested in the effects of psychological factors influencing sport participation and performance (Williams & Straub, 2006). Researchers would agree that there are various physical, psychological, environmental, social, and emotional factors present in an athlete's life playing a role in determining elite or peak performance (Hackfort, 2006; Hackfort & Tenenbaum, 2006; Johnson & Tenenbaum, 2006). Studies on individual as well as team sports have indicated that

psychological factors such as motivation, attitude, focus and attention, visualisation (mental imagery), coach-athlete relationship, and team-cohesion contribute significantly to performance (Krane & Williams, 2006). The effects and influence of emotions in sport have also been studied by various researchers such as Deci, Hanin and Lazarus (Robazza, 2006). Rugby is a very popular sport in South Africa and sport psychologists could therefore be interested in gaining more knowledge concerning the factors contributing to rugby performance. Limited studies have been conducted in South Africa on team sports such as rugby specifically concerning psychological factors contributing to sport performance (Potgieter, Grobbelaar & Andrew, 2008).

Rugby is a competitive contact sport and played by teams of fifteen players each for eighty minutes on a big open field. The game is characterized by activities such as running, jumping, tackling, scrumming and scoring tries. It could, therefore, be expected that physical attributes of a rugby player such as strength, speed, weight, length, ball-skills, fitness and endurance are important to keep in mind when studying/investigating rugby performance. Psychological attributes such as motivation, confidence, focus and mental toughness, leading to commitment and determination to practise and participate in rugby, can, however, be regarded as just as important. These factors along with the social influences, such as team member- and coach-athlete relationship, would further be considered most likely to affect performance on the rugby field. Other factors such as spirituality (including religious beliefs and finding purpose and meaning) as well as emotional make-up should, in addition, be expected to be relevant when investigating factors contributing to rugby performance.

It is clear that more and more professional support and expert attention has been assigned to rugby, with the aim to establish winning teams. Rugby, as a professionally played sport, consists of a well-developed rewards and punishment system. Aspirant players start playing rugby at school level and may start playing professional rugby from the age of ±20 years remaining at that level for at the most fifteen years up to the age of ±35 years. Although it is difficult to reach the professional level in rugby, with the necessary physical, psychological and social make-up, a player could later on be selected to represent his or her country on international level. However, with this highest reward in rugby comes responsibility. A rugby player should be able to adhere to rules and regulations and have self-discipline to control him- or herself within the pre-set

borders of the sport. If not, a rugby player will be punished which might be detrimental to his or her popularity and image as a player, or it might even mean such a player might lose his or her place in the rugby team.

In South Africa, the feeding ground for the development of rugby players into professional players start at primary school level, becoming more prominent at high school level. From hundreds of schools participating in rugby competitions, roughly only two to three hundred rugby players will be identified and developed to international level of whom only an estimated thirty players will be chosen for the national Springbok squad/team per season. So the questions remain: What attributes in rugby players are still in need of further development in order to advance to a higher level and could this be determined from a young school age? What effect would these attributes have on team performance or the outcome of a rugby game? If a combination of factors, what would the weight of each attribute be in relation to others and could the information obtained be significant to assist coaches and selectors in establishing a winning team?

Local rugby research is lacking information on the effect of negative emotional behaviour (which may lead to penalties, yellow or red cards) and the inability to control them effectively on the performance of a team. If teams consisted of more individuals who were able to effectively manage their emotions, would such a team perform better than another team? In other words, would a rugby team with higher emotional intelligence scores (taken as the combined emotional intelligence score of individuals in the team) be a better performing team? In addition, to what extent in relation to other factors would it contribute to performance?

The researcher's intention was to find answers to these questions and investigate the possibility of emotional intelligence (summarised as the effective management of emotions) being a predictor of performance (i.e. being in the best team performing at your best to, for example, win the match) as well as in relation with other predictors of sport performance.

1.2.2   Focus and scope of this research study

Various physical, psychological, social, environmental and emotional (and perhaps also spiritual) factors are commonly attributed to rugby players and are viewed to contribute to their rugby performance. Rugby performance (as a team performance) is further commonly judged by the outcome of a specific game; the measure in this regard being to win a game and ultimately the competition. The aim of team performance in a competitive sport such as rugby would primarily then be to win. In order to achieve this, the best team would have to be selected.

The researcher's perception was that many rugby games have been lost because of penalties, as well as yellow and/or red cards issued because of negative (emotional) behaviour. He was therefore interested in investigating emotional intelligence as predictor of rugby performance, to serve as a preliminary means to address and eliminate negative emotional behaviour affecting the outcome of a rugby game. The outcome of a rugby game could, however, depend on many other factors not attributed to the players themselves such as external environmental factors, home field advantage, refereeing, and even the bounce of the 'egg-shaped' ball. Factors contributing to rugby performance were limited for this study to include only certain physical, psychological, social, spiritual and emotional (in this case emotional intelligence) factors as reported on by the participating rugby players themselves.

From the many physical, psychological, social, spiritual and emotional factors contributing to sport performance and success in sport, specific factors were selected for this study. These factors include mental toughness, motivation, focus, personal attributes and attitude, mental imagery, coaching and coach-athlete relationship, team-cohesion, talent and physical attributes, spiritual aspects and emotional intelligence.

The factors were to be investigated through the completion of a self-evaluation questionnaire by selected first or A-team and second or B-team school rugby players. By self-report measurement, the players' subjective evaluations and perceptions of themselves relating to the factors could be obtained and then objectified through statistical principles and methods. Hypotheses would then be formulated and participant players from the sample group divided into two experimental

teams. The two teams were finally to be compared with each another in terms of the factors influencing rugby performance.

The sample group of rugby players would consist of volunteers from four high schools in Pretoria playing for the first and second teams of the school with a few players playing for a younger A-team and B-team. Inclusion into the study's A-team and B-team would be based on players' indication of the school rugby team they mostly played for during 2009, with an additional criterion of only including start-up players into the study's A-team (thereby resulting in all other players being included into the study's B-team). The researcher intended to include only the 'best' school A-team players into the study's A-team. Schools' allocations to their respective teams were intended to establish the 'best performing team' for the school as the first or A-team.

The study did not seek to thoroughly investigate the distinction made by the schools to differentiate between A-team and B-team players, although certain criteria indicated by coaches and/or selectors would be taken into consideration for interpretation of results of the study. The main aim, however, was to determine the difference between the two teams as indication of performance with regards to specific physical, psychological, social, spiritual and emotional aspects as contributors to performance in rugby.

Data gathering took place at the end of the rugby season to ensure that selected team players have had considerable match time exposure and teams have had sufficient time to perform. Once collected, captured, cleaned, and analysed, the data were then interpreted. The findings of the study were used to indicate to the four participating South African high schools the significance of the chosen factors in terms of rugby performance. Thus, the study's contribution to psychological knowledge and the development of further understanding of factors influencing rugby performance could be recorded.

CHAPTER 2

PHYSICAL, PSYCHOLOGICAL, SOCIAL AND SPIRITUAL PREDICTORS OF SPORT PERFORMANCE

2.1 INTRODUCTION

2.1.1 Sport performance

Various aspects influencing an athlete's performance have been extensively researched over the years by several researchers (Hanin, 2000a; Jackson & Csikszentmihalyi, 1999; Johnson & Tenenbaum, 2006; Moran, 2004). Sport or athletic performance simply refers to an athlete's ability and/or skill to execute or perform a required sport task. This could be developed through practice and then demonstrated by participating in a competition. The ability to perform may depend on an athlete being naturally gifted, genetically predisposed with talent or an athletic ability being nurtured during the developmental years (Johnson & Tenenbaum, 2006). Natural physical as well as mental psychological factors play a significant role in sport performance (Weinberg & Gould, 2007).

The idea of athletes having general super-ability or of athletes having a specific personality profile enabling them to perform, has been rejected due to the lack of sufficient evidence (Jarvis, 2006; Vealey, 2007; Weinberg & Gould, 2007). The general acceptance is rather that athletic ability and performance is sport domain specific, differing from sport to sport (Jarvis, 2006).

What then would be considered determining factors to distinguish between an average performance in sport and a peak or superior performance in sport?

2.1.2 Peak performance

In the Sport and Exercise Psychology field, peak or expert performance was defined by Privette (cited in Krane & Williams, 2006) as "behaviour which exceeds one's average performance" or "an episode of superior performance" (p. 207). Johnson and Tenenbaum (2006) view expert sport performance as the performance of an athlete at his or her highest level over an extended period. Privette and Bundrick (cited in Hanin, 2000a) distinguished between peak experience and peak performance by depicting them as the "positive extreme of feeling" versus the "positive extreme of performance" and further suggested that the two can function independently of one another with regards to sport behaviour (p. 149).

According to Moran (2004), expert performers perform well regularly and relatively on a higher level than the general population within a specific sport. It is generally accepted that a variety of factors such as environmental, physical, psychological, social, and emotional factors play an interactive role in achieving expert performance in sport (Dick, 2002; Krane & Williams, 2006; Taylor & Wilson, 2005). The psychological factors identified by researchers in this field include aspects such as expert performers having more knowledge than novices do about their sport specifics, having better anticipation skills and having better insight and control over their own mental processes (Moran, 2004).

The role of emotions in sport and sport performance has been highlighted by many research studies (Hanin, 2000a; Jones, 2003; Jones, Taylor, Tanaka-Oulevey, & Daubert, 2005; Kerr, 1997; Lazarus, 2000; Robazza, 2006; Vallerand, 1983). For example, independent studies conducted by Cohn and Loehr as well as Ravizza (cited in Krane & Williams, 2006) indicated emotional characteristics associated with peak performance in sport ranging from loss of/no fear to feelings of being in complete control (having control over emotions) to extraordinary awareness and optimism as well as feelings of self-confidence, happiness, mental calmness, and excitement.

Researchers have also studied the psychological states of peak performing athletes including their emotional states. Hanin (2000b) found differences amongst athletes with regards to emotional

states associated with performance by using the **Individualised Zone of Optimal Functioning** (IZOF) model. Athletes' positive and negative emotions associated with successful and unsuccessful performances were measured to identify emotional patterns of optimal and non-optimal performance. Specific emotions hindering or assisting performance were included as well as the intensity thereof. It was found that emotional patterns associated with optimal performance existed for individual athletes and that these patterns differ between athletes (Hanin, 2000b). This model suggests that optimal performance in sport is uniquely related to an athlete's individualised zone of optimal functioning wherein certain negative and positive emotions experienced can be optimal, while others (positive and negative) could be dysfunctional (Krane & Williams, 2006).

2.1.3   Predictors of sport performance

In rugby, as in many other sports, various factors may contribute to performance. These factors include physical, environmental, psychological, social, spiritual, and emotional factors. For this research study the factors to be investigated were limited to a number of factors identified by the researcher from the literature studied. Such factors were then to be regarded as the predictors of rugby performance for this study. The selected physical, psychological, social and spiritual factors contributing to (or then predicting) sport performance will be discussed further in this chapter while the emotional factors (or emotional intelligence as predictor) will be discussed in Chapter 3.

2.2   PHYSICAL, PSYCHOLOGICAL, SOCIAL AND SPIRITUAL PREDICTORS OF SPORT PERFORMANCE

Through exploration of literature, specific physical, psychological, social and spiritual factors or predictors of sport performance were identified. These factors include the following:

2.2.1 Mental toughness

Mental toughness might be one of the most sought after qualities any sportsperson could aspire to have. Various authors have written on the subject of mental toughness, what it means to elite athletes and its influence on sport and sport performance (Clough, Earle & Sewell, 2002; Kremer & Moran, 2008; Moran, 2004; Weinberg & Gould, 2007; Zinsser, Bunker & Williams, 2006). They commonly associated mental toughness with drive, passion, 'to have the edge', never quitting, challenging pressures, control and composure, coping with stress and tension conversion.

Mental toughness is viewed as an inclusive construct. According to Moran (2004), it entails the ability to perform by effectively **coping** with pressure or setbacks and past failures, exercising **control** over situations and/or emotions, and **persisting** regardless of the circumstances. It is also regarded as mental resilience or hardiness, which includes rebounding from failure (Jarvis, 2006). Fourie and Potgieter (2001) identified components thereof including motivational level, coping skills, discipline, goal-directedness, possession of prerequisite physical and mental requirements, psychological hardiness, as well as religious convictions. In their study amongst 131 expert coaches and 160 elite athletes from various sport codes, they found that coaches and athletes regarded concentration and perseverance respectively as the most important aspects relating to mental toughness.

Loehr (cited in Clough et al., 2002) defined mental toughness as "the ability to constantly perform to the upper range of your talent and skill regardless of competitive circumstances" (p. 34). A mentally tough athlete has a very steadfast and strong belief in him- or herself to control performance outcome without being profoundly affected by competition difficulties (Moran, 2004). Clough et al. (2002) also related mental toughness to flexibility (ie remaining balanced and un-defensive under pressure), responsiveness (ie staying focused under pressure) and strength (ie having a fighting spirit). Clough, Earle and Sewell (cited in Moran, 2004) further linked mental toughness to the four concepts of the 4C's model namely **control** (by exercising influence in the situation), **commitment** (by being active therein), **challenge** (viewing change as a development opportunity and not a threat) and **confidence** (as a strong sense of self-belief).

Davies (1989) previously related persistence (later associated with mental toughness) to temperament and satisfaction from excelled performance in intense competitive situations. According to him, many great sport persons possessed the quality of persistence. Such a quality could be developed by increasing intrinsic motivation and through practice, extra effort, and hard work. In supporting the idea of developing mental toughness through practice, Kremer and Moran (2008) suggest that through training in pressure situations, athletes could get use to performing therein.

It is clear from the afore mentioned conceptualization of mental toughness, that it is an interlinked concept containing elements of coping ability, resilience, strength and perseverance which may also be required on an emotional level. This attribute may therefore be related to emotional intelligence. Nevertheless, it seems to be an important aspect to consider when rugby performance is investigated. In rugby, players are often confronted with difficult situations, setbacks and pressure on and off the field, and therefore to possess such a quality would be considered advantageous to performance. As the levels at which rugby is played increase, so does the pressure and also potential setbacks. It is therefore essential that rugby players are able to perform and cope with pressure, setbacks, or failure. No wonder Scully and Hume (cited in Moran, 2004) identified mental toughness to be the most important psychological determinant of sport success as perceived by elite athletes and coaches.

2.2.2 Motivation

Motivation, according to Walker, Foster, Daubert and Nathan (2005, p. 4), can be defined as "the drive to engage in an activity" where drive in this instance refers to the **will** of the athlete. Weinberg and Gould (2007) also added the direction and intensity (or amount) of effort put into a task, as an indication of motivation. Motivation ensures that an athlete acts in a certain way as to obtain the desired outcome. Motivation can be **intrinsically** driven (by factors intrinsic to the athlete) such as internal desires and needs to win or **extrinsically** driven (by factors extrinsic to the athlete) such as awards, fame and status in the eyes of others (Duda & Treasure, 2006; Jarvis, 2006; Vallerand & Fortier, 1998; Walker et al., 2005).

Walker et al. (2005) identified three types of intrinsic motivation, namely, intrinsic motivation **towards accomplishments or mastery motivation** (ie performance motivated by the need to experience feelings of competence, achieve results and demonstrate mastery of skills); intrinsic motivation **to experience stimulation** (ie performance motivated by the need to experience peak flow states, excitement or rushing of adrenaline); and intrinsic motivation **to know** (ie performance motivated by the need or desire to satisfy curiosity, the need to understand and make meaning of it or to be unique). Extrinsic motivation, on the other hand, includes the levels of **external regulation** (ie actions influenced by external factors such as rewards, approval, punishments and criticism); **introjection** (ie actions influenced by external factors being internalised due to for instance avoidance of anxiety, fear or embarrassment caused by an over demanding coach); and **identification** (ie actions influenced by the person's valuation and internalisation of certain behaviour observed for instance an athlete proclaiming his or her involvement in a certain sport due to it being an important aspect of his or her own identity) (Walker et al., 2005).

Athletes differ in the reasons why they are motivated to participate in competitive sport. They may participate in sport to achieve certain goals, expect certain rewards, or attain certain competencies (Weiss & Ferrer-Caja, 2002). This may include being the best on the field or to win the game. According to Jackson and Csikszentmihalyi (1999) two of the main reasons for taking part in sport are to have fun and develop or demonstrate competence, which in turn were associated with intrinsic reward as well as flow or optimal experience. Walker et al. (2005) linked the degree of motivation to the commitment of an athlete and found evidence for high motivational levels also to be associated with abundant energy and enthusiasm.

Having specific goals to achieve may boost motivation in sport (Moran, 2004) and is associated with improved performance (Kremer & Moran, 2008). According to Jackson and Csikszentmihalyi (1999) having enhanced motivation through setting of goals and being determined in reaching them, could improve the quality of the sport experience and even lead to unexpected achievements. An important aspect of motivation to keep in mind is that it may change over time as well as during and between sport performances. Kremer and Moran (2008) stipulate the importance of goal setting to be focussed on process or performance rather than

outcome as well as the re-adjusting of goals to fit the circumstances. Weiss and Ferrer-Caja (2002) is of the opinion that if an athlete perceives a competition as a way of achieving a mastery goal, intrinsic motivation will be enhanced.

Motivation can enhance many aspects of being an athlete such as the athlete's confidence and competence level, mood and emotional state, physical and psychological well-being, and may also be related to the confidence level of the team collectively (Feltz & Chase, 1998; Kerr, 1997; Weinberg & Gould, 2007). In an interactive team sport such as rugby, it would be more appropriate to investigate the group's collective belief in the team rather than the combination of each separate individual's belief with the aim of assessing motivation in mind. Team motivation or **collective efficacy** is referred to as the "group's judgement of their conjoint capabilities to organize and execute the courses of action required to produce specified levels of performance" (Bandura cited in Feltz & Chase, 1998, p. 66). Collective efficacy involves the group's collective beliefs in, firstly, their ability to meet the demands of specific situations, and secondly, the effectiveness of meeting these demands in relation to the outcome of the group's performance (Walker et al., 2005). One of the most exciting aspects of motivation (especially in team performances) is the so-called **comeback performances**, whereby teams perform much better during the second half of a match than during the first half. Such performances can, therefore, suggest that motivation is something that is under the control of the athlete or team (Walker et al., 2005).

The athlete's **ability** to engage in an activity, which may be considered by some authors as part of motivation (Walker et al., 2005) was **excluded** for this study and therefore motivation in this instance can be defined as:

> the drive or intention to act (within the sport) by deciding consciously or pre-
> consciously through direction of energy, actions and attention towards a sport task
> with the purpose of fulfilling an intrinsic or extrinsic goal. [own definition]

It is generally regarded by scholars that high levels of motivation improve overall sport performance (Duda & Treasure, 2006). Motivation can be interlinked to other factors or predictors of sport and peak sport performance.

2.2.3 Focus

Stratton, Cusimano, Hartman and DeBoom (2005) use the term focus to describe "the phenomenon of attending to particular internal and external cues that positively or negatively influence athletic performance" (p. 53). According to them optimal focus allows an athlete to direct attention to relevant cues, obtain useful information and be able to evaluate conditions associated with the competition effectively. The athlete can then make use of planning strategies to ensure proper decision-making and boost competition performance. Cue-words, mental imagery, goal setting, positive self-talk, relaxation exercises, and control over emotions are various techniques to assist athletes in focusing (Stratton et al., 2005). Kremer and Moran (2008) highlighted having a clear goal in mind, not over-analysing mechanics of skills or technique, a mind clear from all distracting thoughts and staying within the present and focusing on what can be done now, as effective in producing winning performances.

The interrelatedness of focus to other predictors of sport performance is also visible. For this study focus was used as a broader term to include attention and concentration; intensity and flow; routines; and cue-words.

2.2.3.1 Attention and concentration

Attention and concentration are general terms used to describe focus and imply to concentrate on a specific action and direct attention by having a specific goal in mind (Kremer & Moran, 2008). Poor focus leads to attention being directed away from valuable information and towards distracting cues (Stratton et al., 2005). Kremer and Moran (2008) distinguish between broad and narrow focus. Examples hereof would be to quickly read and assess a situation in order to act compared to focusing attention to act on a specific target within a given situation.

Selective perception or 'zooming in' while ignoring distractions, is a way of focusing attention to a specific task. Another attention skill involving concentration or focus is the ability to perform two or more tasks or actions simultaneously and equally well (multi-tasking). This is made possible through extensive practice and co-ordination of the actions (Moran, 2004; Stratton et al., 2005). Two ways of improving attention and focus include: a) acquiring skills - the less an athlete needs to focus on the execution of a certain skill, the more he or she can focus on performing well; and b) through automated performance, requiring little conscious effort, an expert athlete has more time available to attend to cues and information necessary to focus on performing better than a novice (Stratton et al., 2005).

2.2.3.2 Intensity and flow

The terms intensity and flow are closely associated with focus. Stratton et al. (2005) describe intensity in terms of a strong and continual desire to perform well and be able to win. According to Wilson, Taylor, Gundersen and Brahm (2005), intensity can be seen as the positive association an athlete has with sensations more commonly described by terms such as arousal, anxiety and nervousness. Zaichkowsky and Takenaka (cited in Wilson et al., 2005) are of the opinion that intensity consists of three qualities affecting performance namely, **physiological activation** (ie heart rate), **behavioural responses** (ie motoric activity) and **cognitive** and **emotional responses** (ie positive or negative perceptions and behaviours). Intensity is unique to an athlete and it is dependent on his or her perceptive evaluation thereof (ie positive versus negative) as well as the competitive situation (ie weather, facility, or crowd size). It could also change or shift during competitions and be influenced by past experiences (ie determined by optimism versus pessimism), and is not specific to a sport type (Wilson et al., 2005).

Kahneman's model (cited in Stratton et al., 2005) suggests flexible but limited attention of athletes due to certain constraints in terms of intensity. Variations in intensity can cause athletes to direct attention on unnecessary information preventing them to focus and perform well. An optimal level of intensity may be obtained by using all attention resources available (Stratton et al., 2005). Optimal intensity, according to Wilson et al. (2005) is personalised by each athlete on the ideal level (a combination of physiological and cognitive intensity) to allow him or her to

perform at their best. Certain factors that may contribute to this ideal state include personal, social, and situational factors of which the athlete may or may not be aware of or have control over. The aim of athletes, therefore, should be to identify their own level of optimal intensity, in order to regulate intensity.

Flow or optimal experience, according to Jackson and Csikszentmihalyi (1999), "is a state of consciousness where one becomes totally absorbed in the activity, to the exclusion of all other thoughts and emotions" (p. 5). They further describe it as an experience where mind and body work effortlessly together in harmony. Jackson, Thomas, Marsh and Smethurst (cited in Moran, 2004), supports the view of flow being an intense focused state of concentration resulting in activity absorption. Moran (2004) also relates flow or flow states with the peak performance experience of an athlete when physical, technical, tactical, and psychological components of the sporting performance are perfectly interlinked. He further adds that in such states, performers could be so deeply immersed in the activity at hand, that they loose track of time. Short-term feelings of elevated alertness, euphoria and joy are usually experienced during this state as well (Moran, 2004).

2.2.3.3 Routines

Schack, Whitmarsh, Pike and Redden (2005) define a routine as "a series of pre-performance behaviours organised into a comprehensive plan aimed at maximizing the performance" (p. 138) therefore consisting of cognitive and/or behavioural strategies used by athletes as well as coaches before, during and after performances. Cognitive strategies in pre-performance routines include positive self-talk, focus, mental imagery, and psyching-up (Schack et al., 2005; Weinberg & Gould, 2007). An example of a behavioural routine is the steps used by the place-kickers to kick a goal in rugby (Moran, 2004). Other examples of routines include warm-ups, mental rehearsals (ie pre-match reviewing of demands and challenges ahead), and listening to music before a game (Schack et al., 2005; Weinberg & Gould, 2007). Stratton et al. (2005) suggest a three-step focus routine of **resting** (ie relaxing and recovering), **regrouping** (ie redirecting focus away from negative emotions and replacing it with positive ones) and **refocusing** (ie having clear focus on

the next performance and not to get stuck on past poor performances) that can be used by athletes during breaks to enhance focus and performance.

Through routines, positive influences on performance are maximised and negative influences minimised. Pre-, between- and post-performance routines help athletes to control such influences, take responsibility for their own preparation, and be able to continue performing well during competitions and for future competitions (Moran, 2004; Schack et al., 2005; Weinberg & Gould, 2007). Athletes utilise routines to prepare for the unfamiliar circumstances presented by competition, to be ready for the uncontrollable aspects thereof and to direct attention toward the controllable aspects thereof. It assists athletes to perform under pressure and helps them to be more flexible in adjusting to these circumstances by gaining self-awareness to respond positively (Schack et al., 2005).

In team sports, individual routines are supported but need to be incorporated with the team routines with the purpose of ensuring improved team performance and flow. Studies supporting the effectiveness of routines revealed that athletes using routines that included both cognitive and behavioural strategies, were effective in improving their performances and those using routines before a competition performed significantly better than those who did not (Moran, 2004; Schack et al., 2005).

2.2.3.4 Cue-words

According to Weinberg and Gould (2007) cue words are a form of self-talk and used to elicit a specific response. Cues are used to enhance focus and could be instructional or motivational in nature. Athletes may use verbal and imagery cues to generate energy while performing (Williams & Harris, 2006). The athlete thinks of words and images associated with the build-up of energy during preparation that will be appropriate to the sport and for use during a performance. Examples of cue-words include terms or phrases such as 'relax', 'go, 'watch the ball' and 'hang in there'. Cues can be used while an athlete is performing and experiencing difficulty to accomplish a task, to help him or her maintain performance, change a pattern, or break a habit (Weinberg & Gould, 2007). Wilson, Peper and Schmid (2006) highlight the use of cues for re-

triggering lost concentration, stating they should be individualised for each athlete to have his or her own unique cues. The authors view it best to use cues focusing on the positive rather than the negative and the present rather than the past or future.

2.2.4 Personal attributes and attitude

In this study, personal attributes and attitude is an inclusive term used for self-efficacy and positive attitude; goal setting; and leadership. These underlying concepts have also been indicated to link to other predictors of sport performance as will be revealed in the discussion thereof.

2.2.4.1 Self-efficacy and positive attitude

Self-efficacy, self-confidence, or sport confidence are used interchangeably to describe confidence in sport. Manzo, Mondin, Clark and Schneider (2005) view self-confidence as the trust in one's own ability and success, or, according to Tutko and Tosi (cited in Manzo et al., 2005), the belief in one's talent, while Bandura (cited in Manzo et al., 2005) regards self-efficacy as a person's belief that he or she possesses the necessary skills to generate a desired outcome. Confidence allows the athlete to trust his or her 'instinctive' skills at times by letting go of overly conscious control (Cashmore, 2002). Efforts to succeed and persistence to continue despite failure are important aspects of self-efficacy. Being creative, knowing one's strengths and weaknesses, accepting challenges by giving one's best and taking risks to succeed, characterise sport confidence further (Tutko & Tosi cited in Manzo et al., 2005).

Self-efficacy depends on the specific situation, influences the person's actions, and may vary from athlete to athlete. According to Leffingwell, Durand-Bush, Wurzberger and Cada (2005), research indicated that confidence vary from competition to competition due to past results. The role of confidence in sport performance has been shown in research to be an important factor to separate successful athletes from less successful athletes, Olympic qualifiers from non-qualifiers, high-level-performing teams from low-level-performing teams as well as it being perceived by a majority of athletes to be related to their success in sport (Manzo et al., 2005, Weinberg & Gould,

2007). These athletes are usually also passionate, remain focused, and in control of their emotions.

Jackson and Csikszentmihalyi (1999) are of the opinion that confidence is developed by thinking on past successes rather than past failures. Other strategies used to enhance and develop confidence include using positive and directed self-talk, thinking and acting confidently, recognising and focusing on strengths by modelling confident role models, enjoying successes, and challenging adversity and difficult situations (Manzo et al., 2005; Weinberg & Gould, 2007).

Confident athletes are positive and motivated (Manzo et al., 2005). Confidence can also be build through a positive attitude in as far as an athlete thinks and acts positively and expects positive outcomes (Weinberg & Gould, 2007). Cashmore (2002) suggests confidence can be instilled in an athlete through affirmations or, according to Moore (cited in Cashmore, 2002), strong and realistic positive statements. Confident athletes are characterised by remaining confident and being positive despite poor performances and during difficult competitions, (Tutko & Tosi cited in Manzo et al., 2005). Gould (2009) further mentions that less successful performers might have too many negative thoughts that interfere with performance and therefore lowers confidence. One of the strategies to help enhance and maintain performance includes controlling of negative thinking through stopping and reframing negative thoughts (Gould, 2009). Davies (1989) relates expectancy of success to actual level of success. If athletes expect to win, they mostly do.

Vealey (cited in Cashmore, 2002) suggested sport-confidence might be transferable so that it may be carried over from one athlete (and sport) to another due to a specific kind of personality trait. Davies (1989) relates confidence to stress tolerance, coaching, and coach-athlete relationship. The more effective these factors are the more confidence an athlete will have. Weinberg and Gould (2007) claims further that higher collective or team efficacy (seen as the team members' collective confidence in the team as a whole) is positively related to performance.

2.2.4.2 Goal setting

It is generally accepted that goals and goal setting enhance sport performance (Gould, 2006). Moran (2004) defined a goal as "a target or objective which people strive to attain" (p. 55). This objective could be to win a match, achieve personal standards, or be selected for the A-team. Three types of goals associated with sport can be distinguished, namely: a) **outcome** or **result** goals dependent on the abilities and performance of athletes themselves as well as opponents (eg the objective is to win in a competition); b) **performance** goals independent of other athletes and largely under the control of the performer (eg the realising of a personal standard of competence); and c) **process** goals focussing on the execution of a particular action under the direct control of the performer (eg strategies of action by which an athlete performs a particular skill) (Moran, 2004; Weinberg, Harmison, Rosenkranz & Hookom, 2005).

Goal setting refers to the process by which an athlete sets desirable goals and objectives to direct his or her actions (Weinberg & Gould, 2007). Goal setting can affect athletic performance by: a) focussing attention towards specific activities (eg improve fitness in order to stay on the team); b) bringing forth effort and commitment in an athlete (eg team talk during half-time as reminder of the collective goal at hand); c) encouraging athletes to be persistent (eg measuring progress in terms of targets by using fitness chart and training schedules); d) assisting an athlete to separate unmanageable problems into manageable parts through a plan of action (eg practicing fifty place kicks a day from specific spots on the rugby field in order to improve kicking accuracy); and/or e) influencing performance indirectly by raising the level of self-confidence (eg achieving a goal reinforces the athlete's faith in his or her own ability and strengthens feelings of satisfaction and achievement) (Moran, 2004). Kremer and Scully (2002) also mention the fact that goal setting may assist players in a team with motivational problems to increase their level of performance.

Kremer and Moran (2008) believe goal setting assists sportspersons to improve self-motivation, which may lead to increased performance. They associate goal setting strongly with focusing of concentration and actions leading to improved performance. Direction and drive or energy is necessary for motivation to be effective (Moran, 2004). A map or signpost is therefore needed to channel this motivational energy. This can be acquired through the process of goal setting.

2.2.4.3 Leadership

Leadership in sport mostly refers to the coach and/or coaching influence on an athlete's performance. For this research, leadership refers to a rugby player's influence on others within the team, his or her ability to take control over own actions, and being responsible for own performance in contribution to the team's performance. The individual player in a team sport regards him- or herself as part of the team and therefore accepts responsibility for his or her role within the team. A good leader is able to show his or her leadership qualities to others, in other words, to lead by example, and be able to encourage other team members.

Leadership includes aspects such as the inspiration and guidance of others, arousing of enthusiasm and leading through example (Goleman, 2004b; Spencer, Ryan & Bernhard, 2008). According to Murray and Mann (2006), leaders work with and influence others. They state that a successful leader acknowledges the importance of getting along, communicating to, and respecting others. Kremer and Moran (2008) support this view of leadership in terms of effective communication to and accommodation of others in the team but add that such a leader should also consider the team's needs.

Leadership is associated with one's confidence in own abilities. As athletes gain more confidence over time, their ability to control various situations of the sport may develop also (Jackson & Csikszentmihalyi, 1999; Manzo et al., 2005). Leadership is also closely related to goal setting. Setting goals that are difficult but possible to achieve, characterise effective leadership (Kremer & Moran, 2008). Athletes will, therefore, determine these goals for themselves and aspire to attain them. In so doing, a higher level of performance in sport can be reached. Athletes with leadership abilities are successful performers and often achieve their aims set for themselves. Successful performances can then lead to improved leadership ability. Developing leadership within a team entails establishing a climate of trust, accepting uniqueness of individual players, allowing individuals gradually to have more responsibility, encouraging player input and providing opportunity for leadership amongst other players (Murray & Mann, 2006).

2.2.5 Mental imagery

Hale, Seiser, McGuire and Weinrich (2005) are of the opinion that mental imagery is an internal process of rehearsing and representing the athletic sensory experience, not just creating pictures in one's mind, but also consisting of the intellectual process of visualising oneself in action. It involves sight, sound, touch, movement, smell, and taste as well as emotions, thoughts and actions. The terms mental practice, mental rehearsal and visualization have been historically used to describe these structured techniques (Moran, 2004). Through this technique, an athletic performance is created or re-created to enhance performance during training and in competitions (Vealey & Greenleaf, 2006). It can also be described as the reproduction of the (pre-empted) experience in such a way as to make it feel real to the athlete (Hale et al., 2005). Attention to and awareness of the athlete's own performance of how it feels in a real situation, is necessary for effective imagery (Jackson & Csikszentmihalyi, 1999). The idea here is to create positive outcomes and not to be stuck on negative images with regards to past failures and/or mistakes. The skill of mental imagery is not spontaneous and has to be trained and developed over time. This could be accomplished by following a structured program (Hale et al., 2005; Vealey & Greenleaf, 2006).

Mental imagery can be used in preparation for sport participation as well as during competitions or matches. It helps to improve physical, psychological and perceptual skills and athletes could incorporate mental imagery into their routines before competitions as a means of ensuring/enhancing total preparation - physically, technically, tactically and mentally (Hale et al., 2005). During competition (especially within sports that have short bursts or breaks in between), mental imagery can be used effectively by athletes to maintain their level of optimal performance. By also utilising breaks within the competition (ie half time, penalties, injuries) solutions to unsuccessful performances can be provided (Hale et al., 2005). Mental imagery helps the athlete to review pre-break performance and to identify effective as well as ineffective areas of performance.

Moritz, Hall, Martin and Vadocz (cited in Hale et al., 2005) proposed improved athletic performance through imagery when general tactics, specific skills and overall performance are

rehearsed, by successfully using particular mental skills. Examples hereof are self-talk and being focused. Tactics to affect mental imagery positively include reacting to competitive stress and emotions effectively, having feelings of performing successfully and achieving a desired goal. Jackson and Csikszentmihalyi (1999) support the view of using mental imagery to assist athletes in realising their performance goals. Mental imagery further influences performance by improving motivation, confidence, concentration, focus and intensity; reducing anxiety, controlling negative factors and enhancing positive thoughts and emotions required for successful performance (Hale et al., 2005; Kremer & Moran, 2008; Vealey & Greenleaf, 2006).

Mental imagery is an important mental skill that can assist athletes to improve their overall performance. Research indicates that successful athletes utilize mental imagery more than unsuccessful athletes (Vealey & Greenleaf, 2006). It has been clearly indicated here that this predictor of sport performance is also connected to other predictors of sport performance.

2.2.6 Coaching and coach-athlete relationship

It is generally accepted that the coach, his or her style of coaching and the relationship with the athlete have an effect on the performance of an athlete (Jowett, Paull, Pensgaard, Hoegmo & Riise, 2005; Weinberg & Gould, 2007). A good coach should posses certain characteristics such as **personal qualities** (ie being committed, patient and enthusiastic); **interpersonal skills** (ie be a good listener and communicator); **technical skills** (ie be an able decision-maker, counsellor and goal setter); and **knowledge** (ie of the specific sport and for example about physiology, psychology and medical aspects) (Kremer & Moran, 2008). It is essential that a healthy and effective relationship exists between the coach and athlete so that growth and optimal functioning can be achieved. Such a positive relationship contributes to the development of the athlete within the sporting environment on interpersonal, intrapersonal, psychosocial and sport-specific level (Jowett et al., 2005). The coaching style, coach leadership abilities, climate for learning, communication effectiveness and empowerment of the athlete are all influenced by the relationship between an athlete and a coach (Jarvis, 2006; Jowett, et al., 2005; Krane & Williams, 2006).

Different styles of coaching exist and each can therefore be beneficial to different situations. Dick (2002) developed a coaching continuum highlighting four styles of coaching, namely: **directing**, **coaching**, **supporting** and **counselling** styles. The **directive style** is characterised by little negotiation between the coach and athlete. The athlete also lacks experience and knowledge and the coach focuses on safety and clear communication. The **coaching style** involves leniency towards the athlete in order to start contributing to his or her development and participate in decisions made or even work out own routines. This style is characterised by more interaction between coach and athlete with a focus on expansion of an athlete's initiative. The **supporting style** is more athlete-orientated focusing on the athlete accepting or sharing responsibility. Listening, having patience, co-operating and accepting advice or consulting with others, are some of the behaviours associated with this style. The **counselling style** allows the athlete to organize his or her lifestyle according to training and performance requirements incorporating it with personal experience, methodical support, development and self-determination.

While the coach's position toward the athlete is considered proactively educational, an additional benefit is that he or she could serve as a source of constructive feedback and useful guidance (Dick, 2002). Appropriate feedback in the form of reinforcing positive performance, can increase the motivation level of an athlete (Davies, 1989). Guidance provided by coaches includes identifying talent, providing opportunity to develop skills, be creative and inspired, and encourage confidence in athletes (Durand-Bush, Thompson & Salmela, 2006). Other qualities important to coaching include adaptability of the coach to changing situations, ability to motivate players and effective management of conflict (Kremer & Moran, 2008). In the coach-athlete relationship, it is expected that the coach brings about athletic accomplishment, develops a team's confidence, is enthusiastic, provides positive as well as negative feedback and pay attention to every team member along with making them feel part of the team. He or she should further arrange training sessions and challenging exercises to provide players with the necessary skills and experiences for future competitions (Jowett et al., 2005).

Horn (2002) postulates that a direct link exists between the behaviour of a coach and the behaviour and performance of athletes. The relationship is dynamic and constantly changing due to time and circumstances and therefore dual participation of both coach and athlete is necessary

to ensure adaptability, flexibility and growth (Jowett et al., 2005). Jowett and Cockerill, and Jowett and Meek (cited in Jowett et al., 2005) viewed the coach-athlete relationship according to a relationship model whereby the coach and athletes mutually affect one another and their emotions, thoughts and actions play a significant role. Jowett, Jowett and Cockerill, and Jowett and Ntoumanis (cited in Jowett et al., 2005) use the terms **closeness**, **commitment** and **complementarity** to define the coach-athlete relationship. Closeness refers to feelings experienced by the coach and athlete in the relationship such as **liking** (associated with open sharing and disclosing of information), **trust** (promoting self-disclosure, open communication and effective problem solving) and **respect** (implying acceptance, appreciation and worthiness).

According to Jowett et al. (2005), the presence of closeness has been coupled to successful or positive coaching and the absence thereof with less pleasant or unsupportive coaching. Lack of trust seemingly increases competitiveness between coach and athlete resulting in an environment that includes envy and other negative emotions. Commitment refers to the coach's intention to uphold and maximise this relationship. Perceived commitment can lead to better flexibility for ensuring changes needed but lack of commitment (visible through criticism or negative feedback) and lack of common goals and emotional or informational support lead to communication problems and degrading of the relationship. Complementarity refers to establishing an acceptable environment wherein the coach and athlete can work together to improve performance. Complementarity is linked to better performance and satisfying relationships whereby non-complementarity influences the coach-athlete relationship negatively (Jowett et al., 2005).

The coach-athlete relationship is complex where contributing factors such as individual differences, sport and cultural environment play a significant role. This relationship can be influenced by the sport type (ie team versus individual sports), the athlete's competitive level (ie elite versus novice), longevity (ie length of time of the relationship), youth sport (which includes working with the athletes' parents), gender of the coach and athlete (ie opposite sex versus same sex), cultural environment (ie national, racial or ethnic culture), typical and atypical relationship (ie non-related versus related other than sporting relation), and level of motivation (ie in terms of climate, motives, control, time, effort and energy invested) (Jowett et al., 2005). Other factors such as the awareness and expectations of the coach, effectiveness of coach feedback and

adapting to changing circumstances, as well as the athlete's perception of the coach's behaviour, also play an important role in how athletes will behave within the coach-athlete relationship (Horn, 2002; Kremer & Moran, 2008).

In order to facilitate an effective coach-athlete relationship the role of communication and empowerment may not be underestimated. Effective communication includes **active listening** (ie attend, respond, acknowledge and give appropriate feedback); **confirmative and supportive listening and behaviour** (to the athlete's messages) preventing breakdown in communication; **dealing with confrontation or conflict**; and **giving constructive criticism** (by being sensitive in using a positive approach to give criticism) (Weinberg & Gould, 2007). Empowerment of athletes is possible through encouragement to take part in decision-making as well as taking responsibility for their involvement in the sport. This could lead to long-term benefits such as increased independence or knowledge and higher self-confidence, which in turn could also benefit the coach when he or she receives useful feedback from coached athletes, and his or her continued development is ensured (Jowett et al., 2005). Coaching and coach-athlete relationships form an important part of an athlete's sport participating life.

2.2.7   Team-cohesion

A team can be described as a grouping of people with the main purpose of working together to achieve their goal (Schmidt, McGuire, Humphrey, Williams & Grawer, 2005). Jarvis (2006) identifies the typical development of such a group through the stages of **forming** (group members getting to know each other), **storming** (competing for status), **norming** (settling and developing attachments) and **performing** (orientating towards tasks and achieving goals) in order to understand the concept of group cohesion. According to Carron (cited in Schmidt et al., 2005), cohesion could be seen as "a dynamic process that is reflected in the tendency of a group to come together in the pursuit of its goals" (p. 173). Team-cohesion in simple terms refers to the concept of 'team spirit' (Moran, 2004) when the group or team performs as a unit. Team-cohesion varies from members of a team getting along well to being able to perform effectively together. Mutual interaction, intergroup communication, interdependence, establishing common group goals, as

well as group norms are characteristic of effective group cohesion (Eys, Burke, Carron & Dennis, 2006; Schmidt et al., 2005).

According to Kremer and Scully (2002) team-cohesion remains a multi-faceted concept. Cohesion usually consists of four characteristics, namely a **multidimensional construct** (ie several factors differing from group to group), with **dynamic nature** (ie changes over time), and **instrumental nature** (ie groups coming together for a purpose), as well as an **affective dimension** (ie is satisfying/unsatisfying to members for example bonding leads to positive feelings but exclusion may lead to negative feelings) (Loughead & Hardy, 2006). Carron, Widmeyer and Brawley (cited in Schmidt et al., 2005) understood team-cohesion in terms of the collective subjective perceptions of the members of the team. A collective sense of identifying with the group amongst the individual members of the group, therefore, exists that leads to thinking in terms of 'us' in comparison to another group as 'them'.

Within the group, certain dynamics play a role in determining the cohesion of the group. Schmidt et al. (2005) postulate that team-cohesion consists of two dimensions involving unity of the team towards a common goal and individuals' concerns, responsibilities, place and feelings within a team. This may depend on aspects such as quality of team members' relationships amongst each other within the team, striving towards achieving the same or common goals as well as unique individual perceptions and feelings of the team members themselves.

Studies are inconclusive as to whether cohesion is the cause or result of actual performance. Research by Carron and Ball as well as Martens and Peterson (cited in Loughead & Hardy, 2006) found a positive relation (causal effect), but a number of other researchers also found a negative or no relation between team-cohesion and performance (Moran, 2004). The relationship would also seem to be influenced by moderators such as type of cohesion, distinguishing between task cohesion and social cohesion as well as sport type such as **interactive** (ie more complex interdependent interactions) and **coactive** (ie more individuality within the group) sport types (Kremer & Scully, 2002; Moran, 2004). In conclusion one would have enough evidence to support a circular relationship between team-cohesion and performance, but more information about the underlying dynamics as well as mediating variables need to be obtained in order to

determine a linear relation (Loughead & Hardy, 2006). According to Schmidt et al. (2005) research conducted in respect of the relationship between team-cohesion and performance differentiates between social climate based cohesion or **social** cohesion (eg getting along with other team members) and **task** based cohesion or cohesion based on the task that brought the team together. No significant relation was found between social cohesion and performance, but findings indicated that high task cohesion had influenced team performance positively. Bonding between team members and commitment to team goals also lead to better team performance and success. It was further found that the influence of task cohesion on team performance was greater for sports that required higher team-member interdependence (Schmidt et al, 2005).

Kremer and Scully (2002) stipulated that team-cohesion may not predict success, but rather that success may predict team-cohesion. While individual satisfaction may stem from team-cohesion, team-cohesion may also affect team satisfaction, team identity and team self-efficacy (Kremer & Scully, 2002; Moran, 2004). Kremer and Scully (2002) further stressed that higher team-cohesion may lead to less expression of individuality; and increase in pressure on a team could cause team members to turn inwards towards the team and compare their performance with other team members. Creating an atmosphere, not necessarily comfortable and conflict-free, but rather conducive to repeatable good performance, is an important factor to consider in team-cohesion.

2.2.8 Talent and physical attributes

Talent and physical attributes cannot be ignored or be excluded when factors contributing to sport performance are considered. This general term was used to include talent, the genetic predispositions and/or hereditary characteristics, historical successes in an athlete's life, 'natural' ability with regards to certain skills (eg 'ball sense') and physical attributes (eg strength, endurance, speed, fitness and flexibility).

2.2.8.1 Talent and natural ability

Johnson and Tenenbaum (2006) view the term 'talent' or 'talented' as a means "to describe someone who consistently performs highly difficult tasks correctly, or simple tasks exceedingly quick" (p. 27). Determining talent amongst athletes plays an important role in performance in sport. Dick (2002) proposed that young athletes with 'gifted' talent may be identified through exposure to gradual competition progression ranging from regional to national to international level. By identification, according to him, the young athlete could be given the opportunity to develop a natural talent. He further mentioned that in assistance to selecting such athletes it is helpful to take into account the type of body structure, tolerance, training ability (person suitable for the specific training), behaviour and movement patterns and tendencies in order to avoid later disappointment. When identified at an early stage the athlete could be provided the opportunity to move from one sport to another more suitable sport type, for example, moving from an individual sport type to a team sport.

2.2.8.2 Genes and heredity

Davis (1992) mentioned two forces playing a crucial role in the general growth and development of a person namely heredity and environment. Heredity is viewed as the genetic inheritance (eg body shape, body size and muscle speed) received from one's parents. Heredity gives an athlete potential but the fulfilment thereof depends to a certain extent on the environment (eg neighbourhood, diet, disease, exercise and opportunities). He postulates that although one is born with the potential to become very tall or have the genetic ability to be an Olympic gold medallist, malnutrition, disease or discouragement from exercise by others during one's growth and developmental years, may hinder one's potential to be fulfilled (Davis, 1992). According to Johnson and Tenenbaum (2006), athletes could genetically inherit certain factors such as behavioural, cognitive and physical characteristics as well as physiological make-up. In their review of literature on studies conducted regarding these factors, they highlight aspects (for example tough-mindedness, IQ, and skeletal muscle fibre composition), which could determine an athlete's performance level. Noakes (1992) concluded, for example, that genetic factors are

crucial in determining success in running. He highlighted two relevant factors determined by genetic factors as speed and the extent to which an athlete's body can adapt to training.

Researchers in the Sport and Exercise Psychology field know about the ongoing debate of nature (genetic factors) versus nurture (environmental factors) (Johnson & Tenenbaum, 2006). This concerns the question whether talent is naturally bestowed upon oneself (by having the genetic potential) or whether it could (potentially) be developed within a supportive environment. However, it might be more appropriate to consider the interaction of these two factors to enhance performance in sport (Johnson & Tenenbaum, 2006). Sport performance in terms of a genetic predisposition favourable to the performance may depend on individual differences and in terms of the supportive environment, on how the environment is perceived by athletes (Sacks, Pargmann & Tenenbaum, 2006). The importance of family influences on the development of sport talent in a child can also not be denied whether it is positive or negative (Sacks et al., 2006).

In conclusion, although genetic or 'nature' factors may have a strong influence on sport performance, consideration should be given to their interaction with environmental or 'nurture' factors, in determining causes for superior sport performance (Johnson & Tenenbaum, 2006; Sacks et al., 2006).

2.2.8.3 History

It is important to consider the effect of previous successes in sport on athletes' current performance. According to Duda and Treasure (2006) past performances could influence self-efficacy when an athlete has mastered an especially difficult task and has demonstrated this mastery before – success breeds success. It is important for athletes to build their sense of competence through progressive accomplishing of more demanding sport tasks. This could be achieved by breaking down these tasks into manageable parts in order to increase the chances of more positive performance outcomes, which again may lead to an increase in self-efficacy (Duda & Treasure, 2006).

Becoming efficient in a sport activity is demonstrated by Davies (1989) as a learning curve (see Figure 2.1). Through practice and learning, the fastest increase in performance usually takes place in the beginning, but as the activity is mastered, the growth in performance decreases. For each individual the curve of learning would differ, depending on interest and optimum level of performance.
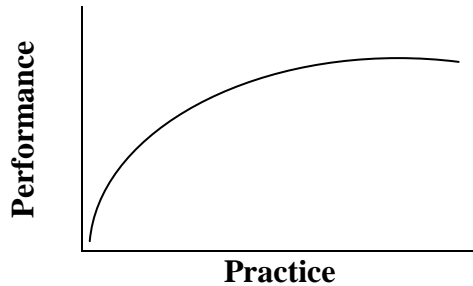
Figure 2.1 Sport Activity Learning Curve (Davies, 1989, p. 7)

Past experiences of success also lead to positive attitude and expectations (Davies, 1989). According to Kerr (1997), successful athletes furthermore achieve and maintain higher levels of arousal (see discussion in Chapter 3) and have more positive and pleasant (and less stressful) experiences than less successful athletes.

2.2.8.4 Skills

Cashmore (2002) viewed a skill as the ability to repeatedly and without much effort perform a series of complex actions in order to achieve a preset aim. Moran (2004) defined a skill as the ability "to transcend the limits of what is humanly possible" (p. 166) and be admired by others. Cashmore (2002) identified three types of skills namely **motor** skills (responsible for the production of complex sequences of physical movement in mainly every sport type), **perceptual** skills (involving the receiving of information concerning the environment via the senses; also very important in mainly all sport types) and **cognitive** skills (relating to thinking, anticipation, and decision-making; also important to all sports and for superior performance). All the above skills may be required in rugby, namely moving around on the rugby field, handling and watching the ball and/or opponents and making decisions.

Sport skills are related to aptitude, ability, training and the competitive environment, which may all influence the degree in which skills are developed and applied. Skills are acquired or achieved rather than ascribed or attributed, because they could be learned, developed, refined and improved upon through training (Cashmore, 2002). Skill development is also associated with physical development and growth (Johnson & Tenenbaum, 2006). Various sport types would require different skills from athletes determined by factors such as response time, motor movements, power, and endurance required. According to Taylor (cited in Weinberg & Williams, 2006) each sport has distinctive physical, technical and logistical demands which require special preparation and which lead to specific skills. The result of how skills are performed could depend on players' speed, power, accuracy, technique and practice (Davis, 1992).

2.2.8.5 Physical attributes (strength, stamina, speed, fitness and flexibility)

When one considers the physical factors involved in sport performance, aspects such as strength, power, endurance or stamina, speed, fitness and flexibility are to be taken into consideration. Dick (2002) views **strength** as "the ability to express force" (p. 223). He further views it as a basic physical characteristic determining sport performance along with speed and endurance. Each sport differs in its strength requirement. He divides strength into **maximum** strength (the greatest force the neuromuscular system is capable of exerting in a single maximum voluntary contraction), **elastic** strength (the ability of the neuromuscular system to overcome resistance with a high speed of contraction ie power and fast strength) and strength **endurance** (the capacity of all parts of the organism to maintain strength expression through fatigue, characterised by a relatively high application of strength, together with mental and physical perseverance). Muscle power as the amount of work that muscles can perform in a period of time, also affects performance, especially in terms of how long (time) this could be maintained (Guyton, 1991).

Physical **endurance** or **stamina** refers to the body's ability to react to the physical demands made on it by the specific sport (Jackson & Csikszentmihalyi, 1999; Kerr, 1997). One aspect of physical endurance involves muscle endurance. According to Guyton (1991), such endurance may be dependent on nutritive support for the muscle (eg high carbohydrate diet provides more glycogen to be stored in muscles than a mixed or high fat diet). Endurance can be enhanced by

the amount of glycogen stored in the muscles before exercise (Guyton, 1991). Endurance in sport in general can be developed through training (Dick, 2002). Important influential factors to consider in this regard involve duration, intensity and repetition of the endurance training, as well as the specific competition demands of the sport. Intensity of the training can be either constant or at a steady pace or changing according to plan over a period. Endurance training can be geared to develop speed as well as strength.

Dick (2002) regards **speed** as the capability of swiftly moving the body or its parts. He categorised performance related speed as **action** speed (ie executing a sport unique action for example kicking the ball), **frequency** speed (ie executing the sport action over a certain period for example running with the ball) and **response** speed (ie responding to execute a sport action for example passing the ball after catching it). He further regarded speed as a critical requirement for achievement in competitive sport, and, although not dependent of strength, developing speed and applying it will certainly contribute to strength.

Although **fitness** in a broader sense may refer to exercising regularly and having a healthy life style, for this research study it was intended to refer to physical fitness only. In general, the definition of physical fitness implies the ability to perform physical (in this case sport) activities with injury or unnecessary fatigue being absent (McNickle, 2004) and includes cardiovascular (aerobic) fitness, muscular fitness and functional (or physical function) fitness (Etnier, 2008). Fitness is specific to each athlete and should be developed in accordance with the specific demands of the sport the athlete is participating in. Dick (2002) views fitness as the level of adaptation to the stressors in one's life and regards it also as essential to 'wellness'. He stresses the importance of a scientifically based and systematic training programme as fundamental to fitness, as it allows the athlete to adapt to stressors. Jarvis (2006) constituted that fitness level along with stamina and health (to include absence of injury) will also have an effect on the sport performance of an athlete.

According to Fleishman (cited in Dick, 2002) **flexibility** can be divided into **extent** flexibility or mobility and **dynamic** flexibility. Extent flexibility is viewed by Dick as the ability to execute combined actions through a variety of movements and optimum use of strength, while dynamic

flexibility refers to the repeated contraction and stretching of the muscles. Extent flexibility is influenced by various factors such as elasticity of muscles and ligaments, body structure, degree to which certain sport specific movement techniques are mastered, the internal and external environment, clothing, age, development stage and injuries. Dynamic flexibility can influence mobility and could be described through terms such as 'agility' or 'quickness', therefore linking technique, speed and mobility with one another (Dick, 2002).

The specifics of the sport (eg physical contact in contact sport) demand that the athlete complies with certain physical requirements. The importance of these physical aspects contributing to sport performance (and specifically to rugby performance) can therefore not be ignored.

2.2.9 Spiritual aspects

The spiritual aspect in sport has been researched by various researchers over the years (Hoffman, 1992a; Nesti, 2007a; Nesti, 2007b; Parry, Robinson, Watson & Nesti, 2007; Robinson, 2007a; Robinson, 2007b). Nesti (2007b) hypothesises that the spiritual dimension to sport is a reality and forms part of the sportsperson's experiences. Scholars have described spirituality in sport in various ways. Underlying to this concept are views of sport as a religious, emotional, and learning experience that includes aspects such as finding control over, being aware of, excel, and develop oneself; finding meaning and value; as well as experiencing emotional humbleness (Aitken, 1992; Flake, 1992; Hoffman, 1992a; Hoffman, 1992b; Parry et al., 2007; Robinson, 2007a; Robinson, 2007b; Watson & White, 2007). The spiritual aspects related to sport performance are increasingly becoming more popular and were therefore included in this study.

In this research study, spiritual aspects include religion (eg religious beliefs athletes have, their faith in a deity or deities, the non-physical, or non-material), superstition and luck (eg a mascot, a charm, or the supernatural), purpose and meaning, and higher state.

2.2.9.1 Religion

Hoffman (1992b; 1992c) related the term 'spiritual' to religious experience and expression. Cashmore (2002) defined religion as "an internally coherent system of beliefs that binds a believer to a pattern of worship, obedience to a super ordinate being and commitment to a specific doctrine that purports to explain problems that are germane to the human condition" (p. 215). He linked sport historically and culturally with religious festivals and competitions as motivational drive for athletic supremacy and godly recognition. Religion has inspired many athletes and numerous winners have acknowledged the role of 'God' in the victory, when interviewed after contests (Cashmore, 2002). To Robinson (2007a) spirituality in sport has the meaning of being aware and appreciative of oneself, others and a deity. Religion relating to sport performance would thereby include performance accredited to a deity or higher being as well as the religious convictions (eg values associated with the belief system) of the athlete.

Positive influences of religion in sport have been identified to include inspiration, motivation, confidence enhancement, belief, expectancy of winning, relaxation assistance and control over anxiety or anger. Negative influences thereof would include being overconfident, having lack of intensity and focusing on difficulties (Cashmore, 2002).

2.2.9.2 Superstition and luck

Cashmore (2002) regards superstition as beliefs, actions, or opinions based on a false perception of cause and effect, which often originates from the reinforcement of behaviour associated with good performance. In sport participation, superstition is represented by rituals, gestures, charms, certain (uncommon) routines and procedures. Common to athletes' superstitious behaviours are the absence of or inadequate evidence to others to recognize that the belief or practice actually works (Cashmore, 2002; Moran, 2004). Superstition can be distinguished from routines by viewing the latter as something athletes are in control of, while the former is often regarded by athletes as something controlling them or stemming from factors outside their control (Burke, Czech, Knight, Scott, Joyner, Benton & Roughton, 2006; Moran, 2004).

Positive influences of the appearance of superstition leading to desired results include increase of confidence and expectancy, improvement of composure and reduction of anxiety whereas negative influences may include obsession, dependence and preoccupation with the superstitious ritual and lack of proper preparation (Cashmore, 2002). Superstitious beliefs vary from athlete to athlete due to gender, sport type, level of participation and years of participation (Burke et al., 2006).

Luck, according to Cashmore (2002), is ever-present in sport and although not rational, maintains fans' fascination with the unpredictability of competitions and involves unforseeability and unexpectedness, which cannot be invoked. Weinberg and Gould (2007) regard luck as an unstable factor to which athletes attribute their successes or failures. Similarly to superstition, luck is also regarded as a factor outside the athlete's control (Weinberg & Gould, 2007). Cashmore (2002) distinguishes luck from fortune (ie something agreeable happening to a person in the normal course of events) by viewing it as something agreeable happening to a person even if it was unlikely to happen. Luck could therefore be regarded as something unforeseen or unexpected happening outside the athlete's control to influence sport performance.

2.2.9.3 Purpose and meaning

Parry et al. (2007) used the term spiritual to refer to the discovery of meaning and value. According to them, it forms part of the athlete's basic motivation to participate in sports and achieve success therein. The spiritual purpose and meaning athletes discover through sport performance may include learning to find control over oneself (Watson & White, 2007); being aware and appreciative of oneself and others (Robinson, 2007a); developing oneself (and one's purpose) by finding meaning (Robinson, 2007b); and aspiring to excel and become whole (Aitken, 1992). Privette and Bundrick (cited in Kimiecik & Jackson, 2002) also related peak experience to spirituality and concluded from a study on peak performers that peak performances are experienced as meaningful and fulfilling (cited in Krane & Williams, 2006).

2.2.9.4 Higher state

Some researchers have indicated that one of the aspects relating to peak performance in sport includes, in one way or another, an elevated or higher state through superior performance or performance at the highest level (Johnson & Tenenbaum, 2006; Krane & Williams, 2006). Parry et al. (2007) used the term 'transcendence' as descriptive of spirituality in sport. Ravizza (cited in Kimiecik & Jackson, 2002) further indicated a sense of self-transcendence as characteristic of sport peak experience. Jackson and Csikszentmihalyi (1999) also compared the flow state of optimal experience to a spiritual experience of "floating" or "walking without touching the ground" (p. 123). In conclusion, expert performers perform regularly and relatively on a higher level than the general population within a specific sport (Johnson & Tenenbaum, 2006). For this study, the spiritual higher state included self-transcendence to a higher state or place of being.

2.3   CONCLUSION

The literature reviewed has shown that a number of factors can either facilitate or inhibit sport performance. Such factors include various physical, psychological, social and spiritual factors related to sport performance. Studies have indicated the role these factors may play in determining or predicting peak sport performance. The inter-relationships between factors or predictors and their effects on one another have been highlighted by researchers. In Chapter 3, emotional factors (and especially emotional intelligence) affecting sport performance, will be discussed.

CHAPTER 3

EMOTIONAL INTELLIGENCE AS A PREDICTOR OF SPORT PERFORMANCE

3.1   INTRODUCTION

Emotions may play just as an important role in sport as any other factor such as the physical, psychological, social and spiritual factors reviewed in Chapter 2. In this chapter, the role that emotions and emotional intelligence play in sport, as viewed by researchers in the Sport and Exercise Psychology field will be reviewed. This researcher will also present his understanding of the emotional intelligence concepts to be used later in the study, through provisioning of his own definitions thereof.

In sport research, certain concepts such as arousal, anxiety and stress may sometimes suffice and be regarded as purely emotional, but these concepts could be distinguished from emotions by also consisting of physical and psychological elements (Jarvis, 2006; Moran, 2004; Weinberg & Gould, 2007). Although these concepts did not form part of the formal research study, they are described as introduction to this chapter for the role that they may play when emotion-related sport performance is considered.

3.1.1   Arousal

Davies (1989) states that 'arousal' refers to the degree of intensity of behaviour and varies on a continuum from deep sleep to a high degree of excitement. Arousal measures include heart rate, pulse rate, blood pressure, respiration rate, (muscle) tension and galvanic skin response (Davies, 1989; Gould, Greenleaf & Krane, 2002). Arousal includes alertness and physiological activation preparing the body for action (Moran, 2004). According to Weinberg and Gould (2007), it involves physiological and psychological activity and refers to the intensity of motivation at a

specific moment. Arousal may be influenced by anxiety as well as pleasant or unpleasant events (Davies, 1989; Weinberg & Gould, 2007).

3.1.2 Anxiety

Buckworth and Dishman (cited in Moran, 2004) define anxiety as "a state of worry, apprehension, or tension that often occurs in the absence of real or imagined danger" (p. 71). In general, anxiety involves worrying by having unpleasant thoughts or emotions. These thoughts may be real or imagined. Anxiety or worrying thoughts and emotions include those related to expectations of performance failure, negative evaluation by oneself or others, and unspecified fear of the unknown, which is generally viewed as having a weakening effect on sport performance. The difference between elite or peak and average sport performance often lies in how athletes cope with anxiety (Jarvis, 2006; Moran, 2004).

According to Onions (cited in Moran, 2004), the term 'anxiety' is derived from the Latin word *angere* meaning 'to choke' (p. 71). Moran (2004) views choking under pressure as a sudden deterioration of sport performance due to anxiety. Baumeister (cited in Moran, 2004) is of the opinion that anxiety causes athletes to evaluate themselves too harshly, thereby leading to deteriorated or poor performance. Emotional anxiety can also have a very disruptive effect on concentration ability by overloading the mind with worries and shifting the athlete's focus (Moran, 2004). An athlete therefore should guard against loss of concentration or focus. This could be achieved by not dwelling on either negative self-evaluative, irrelevant, or 'out-of–their-control' thoughts, or feelings as well as external distractions and potential threats that could cause anxiety.

3.1.3 Stress

According to Selye (cited in Huffman, Vernoy & Vernoy, 1995), stress is defined as "the nonspecific response of the body to any demand made on it" (p. 352). Huffman et al. (1995) claim that this response could arise from either an internal (cognitive) or external (environmental) stressor or stimulus causing the stress. The perceptions of the individual regarding the stress

demand play an important role in determining the response to the stress. If stress is perceived as threatening, it could lead to an increase in anxiety, worry, activation and muscle tension (Weinberg & Gould, 2007). Although the term stress mostly refers to unpleasant stress, it could be either positive or negative to sport performance. Selye (cited in Huffman et al., 1995) distinguishes between **eustress** (that is desirable or pleasant such as exercise and have a positive effect) and **distress** (that is unpleasant such as illness having a negative effect on performance); as well as **hyperstress** (due to an overloaded of too much stress) and **hypostress** (not experiencing enough stress) (cited in Cashmore, 2002).

External influences in sport include the (physical) sport specific demands as well as demands made by the coach and other team members on the athlete. Other external factors such as the presence of an audience could also influence the athlete's response (Davies, 1989). In the end, the response affects the behaviour of an athlete in as far as his or her performance is either facilitated or inhibited. The subsequent behaviour of the athlete to either perform better or worse, in turn, may place new demands on him or her, influencing the perceptions of (stress) demands in future (Davies, 1989).

3.2   EMOTIONS IN SPORT

The psychological aspects related to sport have been studied since as early as the late 19th century with researchers becoming more interested in the emotional aspects involved during the second part of the 20th century (Weinberg & Gould, 2007). Many researchers therefore have studied emotions as a unique part of sport performance (Hanin, 2000a; Jones, 2003; Kerr, 1997; Lazarus, 2000; Vallerand, 1983). Emotions experienced in sport are specific and unique to individual athletes (Jones et al., 2005).

According to Deci (cited in Robazza, 2006) an emotion can be defined as:

> a reaction to a stimulus event (either actual or imagined). It involves change in the
> viscera and musculature of the person, is experienced subjectively in characteristic

ways, is expressed through such means as facial changes and action tendencies, and may mediate and energize subsequent behaviours (p. 129).

From this definition, it can be deducted that emotions are reactive and subjective, can effect change and may cause and influence the sport behaviour following it. Emotions in sport have been studied extensively in order to delve deeper into this interesting phenomenon that is characteristic of athletes.

3.3   THE NEED FOR EMOTIONAL INTELLIGENT BEHAVIOUR IN SPORT

Hanin (2000b), who has conducted extensive research on the role of emotions in sport, developed the Individual Zones of Optimal Functioning (IZOF) model in an attempt to predict individual athletes' successful and less successful performances based on their emotional states. He emphasised the subjective emotional experiences of athletes including their emotions, feelings, mood and affect as essential components of their emotional states. The model identified emotion-performance related patterns in individual athletes (such as elite athletes from various sports) through identifying zones of optimal and dysfunctional emotions. Optimal emotions could be understood as emotions supporting optimal performance or functioning and dysfunctional emotions contributing to deteriorated (dysfunctional) performance. By studying the effect of these emotions on past best and poor performances, it was found that these patterns were unique to different athletes (Hanin, 2000b).

Studies indicated that both positive and negative emotions such as excitement, anger, fear, happiness, sadness, embarrassment and joy or enjoyment were experienced during sport participation (Jackson & Csikszentmihalyi, 1999; Jones, Taylor, Tanaka-Oulevey & Daubert, 2005; Le Roux, 2006). These positive and negative emotions could have positive or negative effects on sport performance. Hanin and Syrjä (cited in Jones et al., 2005) found that individual athletes (junior ice-hockey players in this instance) had identified positive as well as negative emotions which they associated with their performance. Emotions can thus be either helpful or harmful to sport performance.

Emotions may affect sport performance in various ways. The effect of emotions on sport performance has been viewed through research to have an influence on intensity (representing the degree in which emotions are experienced and revealed), motivation, confidence and focus of athletes (Jones et al., 2005; Manzo et al., 2005; Stratton et al., 2005; Walker et al., 2005; Wilson et al., 2005). The research indicated that confidence, expressed in emotional terms, is usually associated with success in sport: success can be the cause of positive emotions; positive emotions could lead to more confidence, which again can lead to more success. Some of the most common negative emotions associated with performance in sport involve fear and anger, which could cause an athlete to loose focus. Relevant important information could be lost this way and lead to an athlete being more easily distracted. Worrying is also an emotion that can lead to poor performance in sport (Jackson & Csikszentmihalyi, 1999). Hanin (cited in Jones et al., 2005) further found that 'optimal' and, on the opposite side, 'dysfunctional' emotions can have either a positive or a negative effect on motivation towards or away from a (sport) goal depending on the person and situation. Robazza (2006) regards emotions as an inherent part of sport competitions. He also views emotions to play a role in various human responses relating to sport such as decision-making, motor responses, learning, intention and social behaviour.

Unique to each athlete and inter-linked to other factors, regulation and management of emotions become important in consideration of optimal sport performance. An athlete's intention should be to learn to effectively cope with his or her emotions during sport participation (Jones et al., 2005). By focusing on awareness, expression, management and control of the different emotions experienced in sport, the athlete can be taught effective ways of channelling emotions to his or her advantage for optimal functioning. When emotions are not effectively controlled during an athlete's performance (for example during a competition), his or her behaviour may lead to poor performance, ill discipline or transgressions of the rules of the sport. The outcome of sport performance in turn may affect the emotions experienced by athletes (Jones et al., 2005; Robazza, 2006). The effective regulation and management of emotions in sport should therefore be pursued which could be achieved through the application of emotional intelligence.

3.4 EMOTIONAL INTELLIGENCE

3.4.1 The concept emotional intelligence

Several researchers, such as Reuven Bar-On, Daniel Goleman, John Mayer and Peter Salovey, have in the recent past introduced and developed the concept of emotional intelligence as a type of intelligence which includes abilities, competencies, and skills and which enables a person to identify emotions, be able to solve emotional issues, as well as to manage and control own emotions (Bar-On, 2006; Goleman, 2004a; Meyer & Zizzi, 2007). According to Bar-On (2006) the works of Thorndike and Wechsler laid the foundation for the conceptualization of emotional intelligence. Thorndike published works on social intelligence and Wechsler referred to 'non-intellective' factors concerning intelligent behaviour. Gardner (cited in Bar-On, 2006) also contributed to the conceptualization of emotional intelligence by distinguishing between **personal intelligence**, including **intrapersonal** or **emotional intelligence**, and **interpersonal** or **social intelligence**.

Salovey and Mayer have used the term emotional intelligence for the first time in 1990 (Schutte & Malouff, 1999). The three categories or domains identified by them for this type of intelligence included **appraisal** and **expression**, **regulation**, and **utilization** of emotions to solve problems and make decisions. Salovey and Mayer (cited in Schutte & Malouff, 1999) first viewed emotional intelligence as an adaptive ability but later revised it as an "ability to perceive, understand, manage and use emotions to facilitate thinking" (cited in Bar-On, 2006, p. 2).

Salovey, Bedell, Detweiler and Mayer (2000) distinguished emotional intelligence from social intelligence by qualifying the former as being more focused and directed towards a range of emotional problems experienced on both an intrapersonal as well as interpersonal level. According to them researchers agreed that emotional intelligence is:

> a set of competencies concerning the appraisal and expression of feelings, the use of emotions to facilitate cognitive activities, knowledge about emotions, and the regulation of emotion (Salovey et al., 2000, p. 510).

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It has been argued in literature that two models exist with regard to emotional intelligence, namely the **ability model** (where emotional intelligence is viewed as a mental ability) and the **mixed model** (emotional intelligence viewed as a combination of adaptive skills or traits and mental ability) (Schutte & Malouff, 1999). According to Caruso (cited in Palmer, Gignac, Ekermans & Stough, 2008) emotional intelligence models flow from three theoretical approaches, namely to view emotional intelligence as: a) an **ability** or "mental ability to do with emotions and the processing of emotional information"; b) a **trait** or "array of socio-emotional traits"; and c) a **competency** or "set of emotional competencies as learned capabilities" (p. 18).

Spielberger (cited in Bar-On, 2006), in turn, referred to three major conceptual models of emotional intelligence depicted in the Encyclopedia of Applied Psychology as: a) the **Salovey-Mayer** or "ability" model; b) the **Goleman** or "wide array of competencies and skills" model; and c) the **Bar-On** or "interrelated emotional and social competencies, skills and facilitators" model (p. 2). The three models differ in the way emotional intelligence is measured namely ability-based measurement, multi-rater measurement and self-report measurement (Bar-On, 2006). Most models of emotional intelligence regard emotional intelligence as being capable of emotional intelligent behaviour on a personal as well as social (or interpersonal) level (Bar-On, 2006; Goleman, 2004a). The different approaches should therefore be regarded as complimentary rather than contradictory in understanding emotional intelligence (Palmer et al., 2008).

Salovey (cited in Goleman, 2004a) divided emotional intelligence into five domains consisting of knowing one's emotions, managing emotions, motivating oneself, recognising emotions in others, and handling relationships. Bar-On (2006) divided it into five domains (or scales), namely the **Intrapersonal**, **Interpersonal**, **Adaptability**, **Stress management** and **General mood** domain consisting of fifteen competencies (skills or sub-scales) namely **Self-regard**, **Emotional self-awareness**, **Assertiveness**, **Independence**, **Self-actualisation**, **Empathy**, **Social responsibility**, **Interpersonal relationship**, **Stress tolerance**, **Impulse control**, **Reality-testing**, **Flexibility**, **Problem-solving**, **Optimism** and **Happiness**). The Bar-On model of emotional intelligence formed the basis for the development of the Emotional Quotient Inventory (EQ-i) test

as a self-report measure of emotional intelligence according to the specific domains (Bar-On, 2006).

3.4.2 Definitions of emotional intelligence

Bar-On (cited in Meyer & Zizzi, 2007) defined emotional intelligence as "an array of non-cognitive abilities, capabilities and skills that influence one's ability to succeed in coping with environmental demands and pressures" (p. 134). According to Goleman (cited in Meyer & Zizzi, 2007) emotional intelligence includes abilities such as "being able to motivate oneself and persist in the face of frustrations, to control impulse and delay gratification, to regulate one's moods and keep distress from swamping the ability to think, to empathize and to hope" (p. 133). Mayer and Salovey (cited in Meyer & Zizzi, 2006), in turn, described it as:

> the ability to perceive accurately, appraise, and express emotions; the ability to access and/or generate feelings when they facilitate thought; the ability to understand emotion and emotional knowledge; and the ability to regulate emotions to promote emotional and intellectual growth (p. 135).

Bar-On (2006) recently defined emotional-social intelligence as:

> a cross-section of interrelated emotional and social competencies, skills and facilitators that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands (p. 3).

The South African researchers Le Roux and De Klerk (2001) regard emotional intelligence to consist of:

> emotional awareness, emotional literacy, emotional control, communication and the relation between thoughts, feelings and behaviour ... the ability to perceive, recognise, understand and react to the feelings of yourself and those of others, … distinguish between various feelings and to name them, … express and control your

feelings appropriately, … listen to others, to have empathy with them and to communicate effectively in terms of emotions and thoughts [and] to use information in directing your thoughts and actions so that you live effectively, are motivated and have a goal in mind (p. 10).

It is clear from the aforementioned definitions that emotional intelligence describes ability and competency to identify, describe, and understand one's own emotions as well as the emotions of others in order to deal with emotional issues and enable oneself to be more effective. Emotional intelligence therefore refers to the emotional aspects of intelligent functioning and performance.

3.4.3   Emotional intelligence past research

Emotional intelligence has been the topic of many studies within the field of Psychology since 1990 and has been researched especially within the occupational environment with findings suggesting a link between emotional intelligence and occupational performance (Emmerling, Shanwal & Mandal, 2008; Goleman, 2004a; Goleman 2004b; Salovey et al. 2000). The Bar-On EQ-i test as well as the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) have been widely utilised in this regard (Bar-On, 2006; Mayer, Salovey & Caruso, 2000; Meyer & Zizzi, 2007; Perlini & Halverson, 2006; Salovey et al. 2000).

The Bar-On EQ-i test is a self-reporting test and the MSCEIT a task-based type test (Salovey et al., 2000). The Bar-On EQ-i measured elevated levels of emotional intelligence associated with high levels of performance amongst occupations such as US Air Force (recruitment), Israeli Defence Force (combat and leadership), account-officer (debt collection), retail management and general practitioner physician (Perlini & Halverson, 2006). Bar-On (cited in Perlini & Halverson, 2006) reported average predictive validity coefficients of 0,54 from a meta-analysis conducted of his own research, suggesting 29% of occupational performance is accounted for by emotional intelligence therefore confirming the link between emotional intelligence and occupational performance.

The MSCEIT has also been utilized in the professional environment and especially when used in a health professions environment, it was found that overweight adults with average emotional intelligence scores had lower negative mood states, higher self-esteem and practised (daily walking) more than people with below average emotional intelligence scores (Meyer & Zizzi, 2007).

In a specific study conducted by Perlini and Halverson (2006) on Canadian National Ice Hockey League players, the Bar-On EQ-i test was used to determine the status of emotional intelligence amongst players. It was found that players scored above the population average on total emotional intelligence as well as on the Intrapersonal, Stress management and General mood scales of the test. Zizzi, Deaner and HirschHorn (2003) also suggested that emotional intelligence competencies are related to sport performance when they found a relation between emotional intelligence and pitching performance amongst Division I baseball players in the USA.

3.4.4 Defining emotional intelligence for this study

For this study, the researcher adapted a mixed model viewpoint on emotional (social) intelligence. According to his viewpoint, emotional intelligence relates to ability, trait, skill, and competency. Emotional intelligence, in this study, was therefore defined as:

> the personal and social ability, trait, skill and competency to be aware of and know emotions in oneself and others in order to express, regulate, channel and control them effectively to perform optimally (in sport).

3.4.5 Measuring emotional intelligence

Emotional intelligence in research has been measured through self-report, task- or performance-based, and behavioural assessment methods (Salovey et al., 2000). Various measuring instruments have been utilised for this purpose (Palmer et al., 2008; Van Rooy & Viswesvaran, 2004). For this study, the researcher used the self-reporting method to measure emotional intelligence. The advantage of a self-report method is that participants can report on their own

perception of their emotional intelligence competency but its disadvantage being, such a competency is not demonstrated (Salovey et al., 2000).

The Bar-On EQ-i self-report instrument was designed to measure an individual's emotional and social intelligence behaviour in order to estimate his or her emotional intelligence (Bar-On, 2006). The instrument consists of 133 items, which are responded upon by respondents evaluating themselves on a 5-point Likert scale ranging from (1) 'very seldom or not true of me' to (5) 'very often true of me or true of me'. The instrument is divided into five scales and fifteen subscales (see Table 3.1), which serve as the factorial framework for the emotional quotient (EQ) scores received (Bar-On, 2006).

Based on the Bar-On EQ-i measuring instrument, the researcher compiled a comprehensive self-evaluation questionnaire aimed at measuring emotional intelligence competencies or skills related to sport performance as perceived by rugby players. Emotional intelligence (referred to as **Emotional aspects related to sport performance** in Section C of the questionnaire) could be measured along with **Demographic information** (Section A of the questionnaire) and **Physical, psychological, social and spiritual aspects related to sport performance** (Section B of the questionnaire).

The researcher used the same scale and sub-scale terms as contained in Bar-On's EQ-i (Table 3.1). Although the same terms were used as indication of emotional intelligence, their conceptualisation was done by the researcher himself independently from Bar-On's description thereof[2]. The researcher phrased the questions to measure these concepts from the literature reviewed and adapted them to the sport context (in this study to rugby specifically). Questions were combined to form item-scales and then used to measure the various emotional intelligence competencies or skills. The sub-scales would mostly be used in the study as indicative of the emotional intelligence aspects relating to sport performance amongst the participating rugby players.

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[2] The researcher had not seen the Bar-On EQ-i or used original definitions of the Bar-On's scales and sub-scales.

Table 3.1 Bar-On EQ-i (Bar-On, 2006) and own study's emotional intelligence scales and subscales

Number	Scales	Number	Sub-scales
1	**Intrapersonal**	1	Self-regard
		2	Emotional self-awareness
		3	Assertiveness
		4	Independence
		5	Self-actualization
2	**Interpersonal**	1	Empathy
		2	Social responsibility
		3	Interpersonal relationship
3	**Stress Management**	1	Stress tolerance
		2	Impulse control
4	**Adaptability**	1	Reality-testing
		2	Flexibility
		3	Problem-solving
5	**General Mood**	1	Optimism
		2	Happiness

The reasons why these scales and sub-scales terms were used are:

a. There is currently no known measuring instrument available in South Africa to measure emotional intelligence within a specific sport type;

b. The researcher defined emotional intelligence in the research relating to the Bar-On model of emotional-social intelligence but applicable to the sport context;

c. The framework of the scales and sub-scales used from the Bar-On model could enable comparisons between emotional intelligence in sport and emotional intelligence in other settings (in which the EQ-i was used);

d. The self-evaluation questionnaire used for this research study within a specific sport type (rugby) could be developed further to also include other sport types;

e.   Although definitions for similar concepts are resultant of the researcher's own work, similarities between concepts are intended in order to ensure bridging amongst the various fields of emotional intelligence research.

3.5   DEFINING EMOTIONAL INTELLIGENCE DOMAINS (SCALES) AND SUB-DOMAINS (SUB-SCALES) FOR THE STUDY

Relevant literature to define the domains and sub-domains of emotional intelligence to be discussed further under the domain headings, has been studied in depth.

3.5.1   Intrapersonal domain

According to Gardner (cited in Goleman, 2004a), intelligence does not compose of only one type but rather a few types of intelligences. He defined one of these intelligences, called intrapersonal intelligence as "a correlative ability, turned inward" and "a capacity to form an accurate, veridical model of oneself and to be able to use that model to operate effectively in life" (Goleman, 2004a, p. 39). Intrapersonal (emotional) intelligence as competency includes aspects such as emotional self-awareness, -knowledge, -confidence, -control and -management, personal responsibility, achievement orientation and drive, persistence, dedication and discipline (Batista-Foguet, Boyatzis, Guillen & Serlavos, 2008; Goleman, 2004a; Goleman, 2004b; Spencer et al., 2008; Srivastava, Sibia & Misra, 2008).

For this research study, the focus is on the feelings that occur **within** the individual person's own self and the internal influence the feelings might have. Intrapersonal intelligence entails being aware of and having control over one's own emotional state, knowing the effects thereof, and how to use it to one's own advantage. The intrapersonal domain includes self-regard, emotional self-awareness, assertiveness, independence and self-actualisation.

3.5.1.1 Self-regard

Self-regard (or self-esteem) refers to the overall attitude or feelings a person has about him- or herself (Baron, Byrne & Branscombe, 2006; Huffman et al., 1995). According to Campbell (cited in Fox, 2002), self-esteem (or self-worth) is "an awareness of good possessed by self" (pp. 84-85) and it is based on various criteria for individuals including culture, education, religion, job performance, physical appearance and financial success. James (cited in Fox, 2002) is of the opinion that self-esteem could also be regarded as an expression of the individual's perception on achieving personal goals. According to Buckworth and Dishman (cited in Weinberg & Gould, 2007) exercise is linked to self-esteem by contributing to increased feelings of self-esteem.

Failure may influence one's self-worth negatively (Jackson & Csikszentmihalyi, 1999) and therefore the way an athlete deals emotionally with failure becomes important. According to Davies (1989), negative thoughts tend to appear because of continued failure and may it therefore affect the athlete's self-esteem. An athlete's self-worth may also be harmed through having unrealistic expectations and being perfectionistic about his or her performance (Le Roux, 2006). Athletes with low self-esteem have less self-confidence than those with high self-esteem (Weinberg & Gould, 2007). To re-establish self-esteem, an athlete should avoid a pessimistic attitude, internalise positive perceptions of him- or herself, and re-emphasise successful performance (Davies, 1989). Enhanced feelings of personal accomplishment, intrinsic motivation and opportunities to achieve renewed success may therefore be advantageous to re-establish self-esteem.

In this research study, self-regard refers to the feelings associated with the respondents' perception of own self-worth, self-respect and self-esteem (meaning to value and have dignity or regard for themselves).

3.5.1.2 Emotional self-awareness

According to Martens (cited in Dick, 2002), the motto of sport psychology is "know thyself" (p. 150). Salovey (cited in Goleman, 2004a) included "knowing one's emotions" or "recognizing a

feeling as it happens" (p. 43) as an indication of emotional self-awareness. He considered emotional self-awareness (or 'knowing one's emotions') as a key principle of emotional intelligence and included it as one of the five domains in the basic definition of emotional intelligence. Goleman (2004b) himself regarded this self-awareness as "knowing one's internal states, preferences, resources and intuitions" (p. 26) and included it as a personal competence in his emotional competence framework for emotional intelligence.

How an athlete performs may be determined by the individual differences in perceiving and interpreting his or her emotions (Jones et al., 2005). It therefore becomes important to recognise subjective emotions experienced by athletes. Subjective emotions in sport are commonly assessed through the administration of self-report inventories. Positive emotions measured included joy, excitement, exhilaration and satisfaction, while negative emotions included frustration, anger, fear and disappointment (Jones et al., 2005). Athletes also describe their emotions as either pleasant (positive) or unpleasant (negative), but consideration should be given to emotions being helpful or harmful to their performance (Hanin, 2000a; Jones et al., 2005). Although negative emotions may inspire or motivate some athletes to perform better, if the experience of such emotions is so unpleasant and harmful to the athlete, it would not be helpful to performance (Jones et al., 2005).

Emotions can lead to physiological changes (eg increased heart rate) in athletes, which then, when perceived, can influence the intensity of the emotions experienced (eg increased levels of such physiological changes could increase the level of anger experienced by the athlete) (Jones et al., 2005). According to Goleman (2004b), self-awareness includes accurate self-assessment of strengths and weaknesses. Dick (2002) further stressed the importance of self-awareness as precedent to learning about self-regulation required for competitions.

Emotional self-awareness, in this research study, refers to the athlete's cognisance and knowledge of own emotions, the reasons for its existence, and its effect on rugby performance. This therefore includes becoming aware of own true feelings by being able to recognise and describe them.

3.5.1.3 Assertiveness

Husman and Silva (cited in Cashmore, 2002) define assertiveness as goal-directed behaviour that may involve the use of "legitimate verbal or physical force [that] requires unusual energy and effort, which in most other social settings would appear to be aggressive behaviour" (pp. 14-15). Cashmore (2002) describes assertiveness in terms of tendencies to express oneself either forcefully, offensively, or dominantly which might be closely linked to aggressiveness. Goleman (2004a) distinguishes between aggression and assertiveness by stating, when assertive, the individual expresses his or her emotions forthrightly but in a way of avoiding such expression to become aggressive or accelerate into a fight. Especially in rugby, where physical confrontation is characteristic of the sport, a fine line exists between assertiveness and aggression leading to harmful intent or a fight (Kerr, 1997). To be assertive in sport would best be described as the athlete's expression of his or her thoughts, feelings and beliefs in an appropriate way without the intent to harm or injure other athletes (according to the legal terms and rules of the sport) (Cashmore, 2002; Yukelson, 2006).

It is not easy being assertive while still maintaining a win-win situation. For this, one requires certain skills such as being able to actively listen to the 'other' party and express oneself without yelling, hitting, blaming or name-calling others (Goleman, 2004a). According to Cashmore (2002), assertiveness is instrumental in sport when being directed towards clear objectives or goals and where these goals are either **specific** (such as scoring in specific situations and tackling hard but fairly) or **general** (ie overall dominance in a competition or psyching out opponents). In order for assertiveness to be effective it should be **displayed** (ie an athlete showing opponents and spectators his or her intent to reach desired goals) and **be pre-emptive** (ie designed to strike or defend against a threatening team achieved by inhibiting or making them indecisive and cautious) (Cashmore, 2002).

Assertiveness, in the current research study, entails the feelings involved in expressing oneself in an assertive manner (eg how the emotions experienced are expressed to the advantage of the respondent's performance).

3.5.1.4 Independence

Independence is related to development of the individual's self-concept but differs for individuals due to the cultural context in which people find themselves (Gangopadhyay & Mandal, 2008). According to Baron et al. (2006) in individualistic cultures people will develop a self-concept "separate or independent of others" and in collectivistic cultures in terms of "one's connections or relationships with others" (p. 175). Collectivist cultures tend to emphasise interdependence and the importance of the group in developing self-concept (Gangopadhyay & Mandal, 2008).

Dick (2002) stresses the uniqueness of each person in as far as his or her personality is determined by (unique) individual characteristics. A difference between athletes and non-athletes exists in terms of dependence whereby (according to Cattell's 16 Personality Factor Questionnaire) "athletes are more independent, objective and extrovert, yet less anxious than non-athletes" (Dick, 2002, p. 171). An independent athlete also tends to emphasise own needs, goals and interests rather than those of the group (Gangopadhyay & Mandal, 2008). There also seems to be a difference in terms of team and individual sports where athletes participating in team sports are more dependent, anxious and extrovert than those participating in individual sport types (Dick, 2002). Emotional independence in sport would therefore refer to the individual's (unique) ability to express, direct, deal with or control his or her emotions independently (or interdependently depending on the type of sport) of others or external circumstances.

Independence, in this research study, refers to the feelings related to the respondent's level of dependency. This includes how the respondent deals with emotions experienced independently or free from control or influence of external circumstances and other people.

3.5.1.5 Self-actualisation

Self-actualisation can be described as "the process of becoming all that one is capable of being" (Cashmore, 2002, p. 226). This concept stems from Kurt Goldstein's view of self-actualization as being the primary motive for human needs or drives as well as Abraham Maslow's hierarchy of needs, wherein self-actualisation as the highest need is reached when one's own potential is

realised (Cashmore, 2002; Huffman et al., 1995). Self-actualisation, according to Maslow (cited in Huffman et al., 1995), is the "inborn drive to develop all one's talents and capacities" or "an innate tendency toward growth that motivates all human behaviour and results in the full realisation of a person's highest potential" (p. 393). According to Cashmore (2002), the relevance of self-actualization to sports participation can be seen through Carl Rogers' viewpoint of regarding all human beings as productively striving for fulfilment and development, as well as through active attempts to develop their maximum potential. This however, varies from person to person.

Self-actualisation can, therefore, serve as a source of motivation in sport in order to achieve one's utmost potential. Individuals who are self-actualised accept themselves and others for who they are and are affectionate towards others, with characteristics of being flexible, problem-centred rather than self-centred, comfortable with uncertainty, spontaneous rather than rigid, open rather than restricted, free from external control rather than submissive to control and experiencing peak experiences (Cashmore, 2002; Huffman et al., 1995). Cashmore (2002) also underlined the importance of conditions to be favourable and allow for the development of self-actualisation to take place.

For this research study, self-actualisation stresses the importance of feelings taking place within the respondent; to express and manage them in such a manner that it would result in the realisation of the individual's full potential through personal sport achievements or peak sport performance.

3.5.2 Interpersonal domain

Gardner (cited in Goleman, 2004a), as part of his multiple intelligences view, defines interpersonal intelligence as "the ability to understand other people: what motivates them, how they work, how to cooperatively work with them" (p. 39). He further included leadership as the ability to foster relationships with others and resolve conflict as part of interpersonal intelligence (Goleman, 2004a). In terms of emotional intelligence, interpersonal intelligence involves the social skill to be socially sensitive by showing respect for others, analyse social situations (eg

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having knowledge and insight concerning others), be able to connect with others, recognise and be aware of others' feelings, needs and differences, and developing others (Goleman, 2004a; Goleman, 2004b; Spencer et al., 2008; Srivastava et al., 2008).

In this research study, the focus is on the feelings occurring **between** individuals interacting with one another and the external influences they have. Such feelings include the feelings shared with the team. This domain of emotional intelligence includes empathy, social responsibility and interpersonal relationship.

3.5.2.1 Empathy

Yukelson (2006) views empathy as a unique kind of understanding of other people from their perspective by literally "putting yourself in the shoes of the other person" (p. 186). Goleman (2004a) regards empathy to be derived from the Greek word *empatheia*, with the meaning "feeling into", and used it as the ability to recognize another's subjective experience (p. 98). In terms of understanding and perceiving another's experiences on an emotional level, Hoffman (cited in Hanin, 2000a) used the term "sharing another's feelings" (p. 43). According to Titchener (cited in Goleman, 2004a) empathy can stem from imitation of another's feelings when such feelings are evoked in oneself. Hanin (2000a) also views empathy as an emotional reaction to share various emotions of another. He regards it further as a capability and process rather than an emotional state (Hanin, 2000a). Goleman (2004a) highlights the advantages of having empathy indicated by findings from Rosenthal's Profile of Nonverbal Sensitivity (PONS) empathy test conducted in a number of countries across the world. According to the results, people who were able to identify others' feelings through nonverbal signs were emotionally better-adjusted, more popular, more extroverted and more sensitive.

Salovey (cited in Goleman, 2004a) included empathy or recognition of emotions in others as one of the five basic domains of the definition of emotional intelligence. Being (empathically) aware of others' feelings, needs and concerns is regarded by Goleman (2004b) himself as an important social competency and he included it in his emotional competence framework of emotional intelligence.

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Empathy, for this research study, refers to the feelings occurring when one is able to recognise, perceive, have an understanding for, and feel others' feelings or emotions within oneself.

3.5.2.2 Social responsibility

Social responsibility describes a person's feelings of responsibility towards other people and the affect it has on others. It entails respecting, caring for and helping others (Weiss & Smith, 2002). As social skill this may also include reaching out to others in order to assist them, being able to organise others through coordinating their efforts, taking initiative, promoting cooperation, as well as being able to mediate disputes, negotiate solutions, and handle conflict (Goleman, 2004a).

Hellison (cited in Weiss & Smith, 2002) developed a self- and social responsibility model to assist students in teaching values to youth offenders in helping them develop personal and social skills. He identified five levels of (self- and social) responsibility that build on one another, namely respecting the rights and feelings of others, being self-motivated (through effort and persistence), being self-directed (ie independent and autonomous), caring about others and working together for the group's welfare, and applying these self- and other responsibilities to practice. Hellison's model was successfully implemented to assist at-risk (ie becoming an offender) basketball players (Weiss & Smith, 2002). The model suggested that social responsibility could be developed through awareness talks, direct instruction, individual decision-making, and self- and group evaluation.

Social responsibility, in the current research study, focuses on the feelings involved when a person perceives him- or herself taking responsibility for own actions within the team as part of the team, as well as taking responsibility for the actions of the other team members'; how this affects others' actions and also relates to rugby performance.

3.5.2.3 Interpersonal relationship

Interpersonal relationships include social association, affiliation, contact and interaction with others (directed either through verbal communication and physical contact or more subtly via body language and non-verbal cues), level of intimacy, personal attraction preferences and trust (Goleman, 2004a; Greendorfer, 2002; Schmidt et al., 2005; Vealey, 2007; Weinberg & Gould, 2007; Widmeyer, Brawley & Carron, 2002;). It therefore focuses on the relationships between the individual and others within the specific sport context. Interpersonal relationships also include the coach-athlete relationship (Jowet et al., 2005; Weinberg & Williams, 2006). Vealey (2007) regarded effective interaction and communication as indicative of interpersonal competence. Interpersonal relationship, as a social skill, entails communication, collaboration and cooperation, and resolving conflict in establishing and maintaining relationships with others, which may include working as part of a team towards a shared goal (Goleman, 2004a).

Frijda and Mesquita (cited in Hanin, 2000a) highlighted the importance of interpersonal emotions having an influence on social interaction by giving meaning and relevance to social contexts as well as affecting interpersonal relationships through evoking responses from others. Vallerand (cited in Hanin, 2000a) suggested another valuable consideration of the interpersonal consequences of emotions. According to him, the specific way an individual presents his or her emotions towards others may influence their emotions and behaviour, while their emotions may, in turn, influence the individual's own emotions and behaviour.

In this research study, interpersonal relationship is indicative of the feelings experienced through the individual's social association, affiliation, contact and interaction with others (which may be direct through verbal communication and physical contact or more subtle via body language and non-verbal cues), and includes the level of intimacy, personal attraction preferences, and trust (or other underlying factors to such relationships). The main focus is on the relationship feelings between the athlete and others within the specific sport (rugby) context.

3.5.3 Stress management domain

Stress can be seen as the relationship between a restrictive or driving force (or stressor) to cause change (or stress) and the response of a person thereto (Cashmore, 2002). Stress then may cause an imbalance between the demands placed on a person and his or her response to it (Weinberg & Gould, 2007). It has been regarded that stress could be either pleasant (eustress) or unpleasant (distress) and be positive or negative to sport performance (Huffman et al., 1995; Weinberg & Gould, 2007). Various external or internal stressors may cause stress such as injury, worry, uncertainty, low self-esteem and previous poor performances (Davies, 1989; Hanin, 2000a; Huffman et al, 1995; Moran, 2004; Weinberg & Gould, 2007). Davies (1989) postulates that at extreme high and low conditions of stress, individuals perform poorly. Intermediate conditions of stress are therefore ideal for best performances in sport.

The negative effects of too much stress on an athlete includes retrogression (return to lower level of skill), lowering of attention and concentration, negative self-talk and losing control of the situation – all aspects of deterioration of performance (Davies, 1989). Athletes are under stress when they regard expectations of them as too high or too low. The effect of such stress includes anxiety and too much arousal and is typically accompanied by changes in physiology and behaviour such as becoming overly aroused (physically) and nervous, worrying, doubting oneself, and committing errors on the sports field (Cashmore, 2002; Davies, 1989; Moran, 2004; Weinberg & Gould, 2007). On the positive side, mild and gradual stress may lead to increase in sport performance levels (Cashmore, 2002; Hanin, 2000a).

For managing stress, Cashmore (2002) suggested a cognitive-affective orientation of stress management training. Stress management aims to modify existing behaviour and influence new patterns of behaviour. This means, according to Smith (cited in Cashmore, 2002), the individual assumes a more active role and takes personal responsibility to develop and apply new ways of thinking about stressful situations. Coping strategies to manage stress in sport participation include deep breathing, imagery, self-talk, relaxation, high arousal control, and self-efficacy enhancement (Cashmore, 2002). Having the right combination of emotions may also assist the athlete to deal with stress and to perform better (Weinberg & Gould, 2007).

In this research study, stress management entails the feelings involved in dealing with stress. The individual's emotional response to effectively cope with or alter internal or external strenuous stimuli is being investigated as well as the effect on subsequent behaviour (in this case sport performance). This domain of emotional intelligence includes stress tolerance and impulse control.

3.5.3.1 Stress tolerance

Lazarus (cited in Cashmore, 2002) views stress as a transaction between the person and the environment. Stress is seen as a product of the interaction between the two in an attempt to affect and change one another. Cashmore (2002) argues that the response to a stressful situation depends on how it is cognitively appraised and the consequences of this appraisal. Depending on how a person can cope with or tolerate stress, certain stressful situations may enhance performance and others inhibit it (Davies, 1989). For instance, experience of stressful competitive situations, may assist an athlete in becoming more accustomed to stress and to learn how to cope with or tolerate it. Stress tolerance varies due to individual differences (such as in personality and experience) and also within situations (Davies, 1989). Factors that influence an athlete's stress tolerance include training, individual physiology, coping strategies and the individual's emotional state (Hanin, 2000a). Cashmore (2002) suggested stress training by using stress to protect against more serious (stress) attacks. Stress could be induced in such amounts to the athlete (while for instance in a relaxed state) to enable him or her to rehearse and practise techniques to cope with it. Through practice, tolerance for stress can be created as the athlete could experience firsthand low-level stress once exposed to a real stressful situation (Cashmore, 2002).

Stress tolerance, in this research study, refers to the feelings present in coping with and managing stress during strenuous circumstances related to the specific sport. This includes adapting, focusing and strategising mechanisms to overcome, minimise and tolerate stress (for example releasing built-up emotions, dealing with negative feelings, re-directing one-self and relaxing) to reduce the effect thereof. Tolerance can also be linked to the way one copes with frustrations, which then can be described as high or low toleration of frustration or stress.

3.5.3.2 Impulse control

Goleman (2004a) views all emotions to lead to one or another impulse to act and therefore regarded impulse control or resisting impulse as a fundamental psychological skill and the basis of all emotional self-control. He uses the phrases "capacity to resist that impulse to act" and "the ability to restrain the emotions and so delay impulse" to describe impulse control (Goleman, 2004a, p. 81). Impulse control as integral part of self-control, also means, according to Spencer et al. (2008) to be able to effectively manage unsettling emotions and impulses under pressure while remaining focused and still think clearly. Goleman (2004b) uses impulse management along with managing internal states and resources as part of self-regulation which was also included as a personal competence in his emotional competence framework of emotional intelligence. Impulse control can also be viewed as the ability to delay gratification in pursuit of a goal which Goleman (2004a) regards essential to emotional self-regulation.

The advantage of impulse control was demonstrated by Mischel (cited in Goleman, 2004a) who found that people who exhibited impulse control early in life later proved to be more socially competent (in as far as they were personally effective, self-assertive, and able to cope with frustrations in life). Such people were also found to be less likely to regress under stress; they embraced challenges and were self-reliant, confident, and dependable. Impulse control as an emotional skill can be learned by distinguishing between feelings and actions, making better decisions by refraining from acting on an impulse, then identifying possible consequences of actions and/or alternative ways of acting before acting (Goleman, 2004a).

Impulse control, for this research study, is signified through focussing on feelings occurring when a person is able to delay immediate gratification of obtaining his or her need and being able to control impulses to act.

3.5.4 Adaptability domain

Adaptability is an individual's ability to adapt to changes in his or her environment (Huffman et al., 1995). Goleman (2004b) sees adaptability as being flexible in managing change, which forms

part of the self-regulation personal competence included in his emotional competence framework of emotional intelligence. According to him, flexibility, as requirement of adaptability, entails also taking into account multiple viewpoints on a given situation. Flexibility allows a person to adapt easily from one situation to another (Huffman et al., 1995).

Energy or vitality could be reduced by negative emotions and affects adaptability to challenges (Rozanski & Kubzansky, 2005). Being able to regulate negative emotions and cope with chronic stress effectively become important to maintain vitality. Lack of adaptability could also be indicative of fear, anxiety, or deep discomfort to change (Goleman, 2004b). Emotional adaptability could therefore assist the athlete in increasing his or her ability to function by adjusting to the specific environmental conditions and negative emotions, which could be achieved by learning to cope with such conditions and emotions (Dick, 2002; Rozanski & Kubzansky, 2005). According to Goleman (2004b), competent people and star performers are adaptable, enjoy change, are open to new information, can let go of old ways of functioning, are comfortable with the anxiety of new or unknown situations and willing to risk doing things in a new way (pp. 98-99). Brokensha and Muller (2007) suggest that "people who have developed and have good adaptability skills are generally flexible, realistic and effective in understanding problematic situations and arriving at adequate solutions" (p. 3).

In the current research study, the focus is on feelings involved in adapting to changing circumstances as perceived by the individual. These changes could be external to the respondent (eg the physical environment or decisions made by others influencing the athlete) or internal (eg mistakes made during matches or own perceptions regarding the strength of opponents). The adaptability domain of emotional intelligence includes reality-testing, flexibility and problem-solving.

3.5.4.1 Reality-testing

According to 'A Dictionary of Psychology 2001' (cited in HighBeam Encyclopedia, 2008) the concept reality testing was introduced by the Austrian neurologist Sigmund Freud, and refers to the "objective differentiation between the external world and one's inner imaginative world, loss

of which … indicate lack of insight" (p. 1). Wikipedia, The Free Encyclopedia (2008) regards it as the ability to differentiate between what is taking place in one's own mind from what is taking place in the outside world. Reality testing is necessary in coping with the outside world, requiring an accurate perception and understanding of the outside world. Reality-testing can often be distorted due to stressful situations (Wikipedia, The Free Encyclopedia, 2008).

Mark Henry (2008), of the Sport Psychology Institute at the University of the North West in exploring the connection between emotional intelligence and sport performance, views reality testing as a characteristic of emotional intelligence. He regards reality testing as being able to correctly and objectively determine if that which is experienced is true by keeping it in perspective (Henry, 2008). Ideally, having realistic opinions and expectations regarding one's own assessment (including also one's own performance) could be accomplished by regularly checking and comparing it with those of others.

In this research study, reality-testing is viewed as the feelings involved in determining the athletes' ability in having realistic opinions and expectations regarding themselves. This includes the evaluation and appreciation of themselves in relation to the objective and real world and/or others.

3.5.4.2 Flexibility

Flexibility can be viewed as the ability a person demonstrates in responding to change (Batista-Foguet et al., 2008). Loehr (cited in Zaro, 2008) regards flexibility as being open, expansive and non-defensive when confronted with stress or an unfamiliar situation. Rozanski and Kubzansky (2005) define emotional flexibility as "the ability to flexibly regulate emotions across a wide range of situations" (p. 3). Zaro (2008) himself relates emotional flexibility to include not giving up when situations are dreary as well as being kind to and thoughtful of opponents during difficulty. According to Goleman (2004b), flexibility is a requirement of adaptability seen as being able to take into consideration various viewpoints on a situation. For this, emotional strength ability, to stay relaxed even when uncertain and remain calm in unexpected situations, is needed (Goleman, 2004b). Loehr (cited in Zaro, 2008) supports the importance of flexibility as a

primary indicator of emotional toughness or strength, which in turn means to be able to resist and apply positive emotions even under immense pressure.

Rozanski and Kubzansky (2005) found in a study that chronic negative emotions could be self-sustained and an indication of inflexibility. Regulation of negative emotions requires a variety of skills such as controlling impulses, positively re-evaluating negative emotional experiences and processing emotional experiences effectively (Rozanski & Kubzansky, 2005). They further found in a correlation study between emotional flexibility, coping flexibility, and health that emotional and coping flexibility were important indicators of managing negative emotions successfully as well as to solve problems effectively.

Flexibility, in this research study, concerns the feelings associated with being able to adapt to changes in the environment and/or to negative situations. Being flexible in this regard includes not being rigid but cooperative and in a sense also compliant.

3.5.4.3 Problem-solving

According to Huffman et al. (1995) problem-solving is "a series of thinking processes we use to reach a goal that is not readily attainable" (p. 229). This entails moving from a problem (given state) to finding a solution (goal state). Problem-solving is an important means of evaluating emotionally charged situations especially when they can cause harm. It could assist athletes in: a) changing their evaluation of the emotional situation (by helping them assess their own ability to cope more effectively with the demands that were initially the cause of the harmful emotional reaction); b) produce alternative reactions to such situations; c) consider the potential consequences of their choices; and d) select the best responses to solve the problem (Jones et al., 2005; Platt, Prout & Metzger cited in Jones et al., 2005). The athlete therefore has to make use of problem-solving techniques in order to better cope with and feel more in control of emotionally demanding situations.

The Psychology Section of the South Australian Sport Institute (2008) postulates that problem-solving involves dealing with sport-related or personal issues such as communication or

relationship issues, sport-related stress, coping with injury, eating or body image issues and motivation problems. Athletes are guided in finding appropriate solutions to these problems through counselling and discussion. The University of Michigan (2008) reckons sport offers students the opportunity to apply problem-solving skills, through analysis and adjustment, to the sports environment and situations. Examples of problem-solving would include analysis of weaknesses of opponents in order to exploit them and adjustment tactics made due to previous losses. They claim athletes constantly learn to better evaluate their environment and make use of mental processes and problem-solving during athletic competition (University of Michigan, 2008). This may include the athlete stepping away from the negatively charged emotional situation (resulting in emotions losing some intensity and influence) and regain a sense of control over the situation and emotions (Jones et al., 2005).

Problem-solving, in this research study, entails the feelings involved when confronted with problems, including those utilised by the individual to solve problems experienced in sport and related to sport performance.

3.5.5 General mood domain

Mood is defined as "a state of emotional or affective arousal of varying, impermanent duration" (Weinberg & Gould, 2007, p. 402). Hanin (2000a) distinguishes between mood as the total day-by-day feelings experienced and emotion as a specific feeling experienced in reaction to certain conditions. Cashmore (200) regards a mood as an all-encompassing persistent state of subjective emotions. Moods can be either positive or negative, relatively long lasting, not be explained by a specific cause or event, and associated with low or no action tendencies (Lane & Terry cited in Robazza, 2006; Watson & Clark cited in Robazza, 2006; Weinberg & Gould, 2007). People are more optimistic in a positive mood state than in a negative mood state and a person's good or bad mood will further influences work persistence indicating how long a person will persist with his or her performance (Gendolla, Brinkmann & Richter, 2007).

Evidence suggests that exercise is positively related to positive mood states and increased neurotransmitter secretion (Dick, 2002; Weinberg & Gould, 2007). According to Dick (2002),

mood disturbances such as continuous depression and unreasonable long-lasting anxiety may be present in athletes, but could be affected by their participation in sport. Participation in sport, interaction with others, distracting effects of exercise diverting attention away from the mood, and self-efficacy emerging from training could function as mediating factors to mood disturbances (Dick, 2002).

Gendolla et al. (2007) developed a mood-behaviour-model to explain the effect of mood on motivation and performance. According to the model, **directive** mood impact or the pursuit of a person's hedonic motive (need to feel good) influences behaviour and therefore performance but is dependent on the context or situational circumstances. For example, in a situation where pleasant feelings are prohibited, the motivational influence decreases. The model further explains how **informational** mood impact or the corresponding effect of mood on 'behaviour-related judgment' influences persistence and intensity of behaviour. Behaviour-related judgment refers to the question an athlete asks concerning a task demand and the answer provided to him- or herself (Gendolla et al., 2007).

General mood, for this research study, consists of the feelings associated with the general emotional state of the respondent over a period and is perceived in terms of, for example, the respondent being optimistic or pessimistic and happy or unhappy. This domain of emotional intelligence includes optimism and happiness.

3.5.5.1 Optimism

Optimism can be defined as a general expectancy that good things will happen when confronted with problems or negative situations in life (Scheier & Carver cited in Franken, 1998). According to Franken (1998), optimism includes a positive attitude towards good things happening and viewing outcomes as achievable regardless of ability, failure, or setbacks. Optimists tend to be persistent and put in more effort while they regard failures or setbacks as temporary, belonging to a certain situation caused by external influences (Franken, 1998; Seligman cited in Franken, 1998). Optimistic athletes take personal responsibility for factors under their control, do not

blame themselves when aspects beyond their control influence their performance and believe that current factors contributing to failure would not affect them in future (Manzo et al., 2005).

Having an optimistic mind-set also strongly attributes to an athlete's confidence (Manzo et al., 2005). Too much concern about how a person is performing (especially concerning faults) could hamper confidence in athletes (Davies, 1989). According to Manzo et al. (2005), an athlete needs to develop an optimistic mind-set. Internally, this could be accomplished by recognising, focusing on, and accepting positive feedback, distancing oneself from negative feedback, and being attuned to confidence-building feedback. An external factor such as positive feedback to an optimistic athlete, raises confidence (as it confirms ability and the athlete's belief in his or her own ability) which is then used in maintaining confidence during setbacks and failures. Optimistic athletes therefore use both success and failure to their advantage in as far as it affects their confidence positively (Manzo et al., 2005).

In this research study, optimism refers to feelings experienced by the individual in order to expect the best possible outcome to his or her actions. This includes hopefulness, cheerfulness, and sanguinity within a current situation, but also expecting an improved future and better end results.

3.5.5.2 Happiness

Jackson and Csikszentmihalyi (1999) are of the opinion that a person is only truly happy, when a task requiring skills, purpose and overcoming difficulty was successfully completed. According to Franken (1998), happiness can either be seen as the result of seeking positive feelings (and therefore avoiding negative one's) or realising a goal or one's own potential. Scanlan and Simons (cited in Hanin, 2000a) define enjoyment as "a positive affective response to the sport experience that reflects generalized feelings such as pleasure, liking, and fun" (p. 139). Joy (or happiness) forms part of the positive experience an athlete has when participating in sport (Hanin, 2000a). Happiness could reduce negative feelings and lead to an increase in energy (Goleman, 2004a). Maslow (cited in Hanin, 2000a) also described peak experience in terms of the moments when happiness was at its highest which then contributed to growth and even actualisation. Jackson and Csikszentmihalyi (1999) connect enjoyment or happiness with flow, as flow is about optimal

experience and when this is reached, an athlete experiences true happiness. Although Lazarus (cited in Hanin, 2000a) regards happiness and joy (or enjoyment) as basically synonymous, he distinguished between them in terms of intensity. According to him happiness (of lower intensity) results in contentment, but joy, in ecstasy.

Happiness for this research study refers to the feelings associated with the individual's state of well-being and supreme happiness. This includes emotions ranging from contentment to satisfaction, enthusiasm, pleasure, intense joy, euphoria, radiance and bliss.

3.6   CONCLUSION

In this chapter, the influence of emotional aspects related to sport performance and specifically emotional intelligence was discussed. Background to the conceptualisation of emotional intelligence for the study and measurement thereof was provided. The description of the underlying terms to conceptualise emotional intelligence for this study was also presented. The literature reviewed supported the researcher's choice of predictor concepts to be used in the research study and indicated them as being connected to sport performance. In the next chapter the methodology used to obtain information regarding the various physical, psychological, social, spiritual and emotional aspects predictors related to and influencing sport (in this case rugby) performance, will be discussed.

CHAPTER 4

METHODOLOGY

4.1 INTRODUCTION

One of the main principles of social science research is to observe social phenomena and then draw conclusions from such observations (Babbie & Mouton, 2001). Research conducted could then produce knowledge of the social world to increase our understanding thereof (Terre Blanche & Durrheim, 2006). In experimental (and thereby quasi-experimental) studies, the researcher is investigating casual relationships between independent variables causing a dependent variable(s) (Babbie & Mouton, 2001). Research studies include explanatory research studies, aiming to explain causal relationships, and applied research studies, providing practical application of the findings to the social science world (Durrheim, 2006).

This research study aims to determine and explain (for practical application to the sport psychology field), whether emotional intelligence is (singularly as well as in relation to other predictors and demographical information) a predictor (or cause) of rugby performance. In order to do so, measurement thereof has to take place. Measurement means expressing observations (or responses obtained from participants) in terms of quantitative (or numerical) data (Vogt, 2006). In other words, numbers are assigned to specific responses obtained through the measuring instrument. The measuring instrument to be used for this research study is a specially designed self-evaluation questionnaire.

The dependent variable for the research study is rugby performance (determined by team standing). Independent variable information includes demographic information of participants collected by means of straightforward and dual-choice questions contained in Section A of the measuring questionnaire. Other independent variable (or predictor) information includes information on physical, psychological, social, spiritual and emotional (or emotional intelligence) aspects related to sport performance obtainable via Section B and Section C of the questionnaire. Section B and Section C consist of specific questions combined as scales (Section B) and sub-

scales (Section C) randomly distributed therein. Formulation of these questions was based on the definitions used to conceptualise them in the literature review chapters.

Numerical scores are to be assigned to responses and information to be captured into the SPSS (version 17.0) statistical data analysis program. Scores would then be calculated for physical, psychological, social and spiritual predictor scales and the emotional intelligence sub-scales. Thereafter, analysis through statistical methods will took place to investigate and interpret these scores in terms of rugby performance, based on inclusion into the study's A-team rather than the study's B-team.

In this chapter, the research design used and the methodology followed, as well as the validity, reliability, limitations and ethical considerations of the research study will be discussed.

4.2 RESEARCH DESIGN

4.2.1 Research aim

The aim of the research is to determine whether emotional intelligence is a predictor of rugby performance and if so, to what extent. Because scholars accept that there are many factors, including emotional intelligence, determining sport (and thereby also rugby) performance (see Chapters 2 and 3), the researcher was interested in investigating the role that emotional intelligence may play independently and in co-existence with such factors as well as the role played by certain demographical factors. In order to do so, information on these factors for two groups (in this case rugby teams) were to be obtained and then compared. The aim of the study is therefore to investigate how the two sport/rugby teams differ on influential factors especially concerning emotional intelligence.

The supposition of the research study is that the better rugby performing team (in other words the A-team) would have significantly higher levels of measured emotional intelligence than the 'lower' performing B-team. If this is so, then it may be concluded that emotional intelligence is a predictor of rugby performance. Emotional intelligence was further to be considered along with

the other (and including proven) factors influencing sport performance to see how strongly it would predict rugby performance. For the purpose of the study, it was presumed that emotional intelligence would be a strong predictor. The presumptions of the study therefore needed to be tested.

4.2.2 Approach

A quantitative approach in realising the research aim was followed. A quantitative research approach enables the researcher to obtain quantitative or objective data through measurement of a particular phenomenon (Durrheim & Painter, 2006). The broad aim of using an experimental design is to determine a cause-effect relationship between a (or more) dependant variable(s) and an independent variable (Tredoux & Smith, 2006). The research design used for this study constituted a quasi-experimental design whereby two teams, distinct, but similar in nature (meaning in most ways), were compared with one another on the various demographic and physical, psychological, social, spiritual and emotional aspect variables.

The research design was chosen because a causal relationship was to be investigated, and random assignment of participants as well as manipulation of all possible independent variables having an effect on the dependent variable, was not possible. In an attempt to equate the two groups, the matching technique in terms of certain critical attributes, was followed. This entailed that all participants were: a) male high school teenager rugby players from the first and second senior teams of the schools; b) learners at predominantly Afrikaans-medium schools; c) of one geographical area (ie Pretoria, Gauteng); and d) with more or less similar ethnical background. Furthermore, the study group consisted of more or less equal numbers of A-team and B-team rugby players. Quasi-experimental designs are usually used in time series designs (Tredoux & Smith, 2006), but was not used in this way for this research study, because of time constraints on gathering information over time (due to learners' busy schedules regarding rugby preparation and other school commitments) and unavailability of members in future (due to leaving school after completion of final exams or being included into a new/different rugby team the following season).

4.2.3   Determining two teams

The research study required two experimental teams for comparison. Volunteering rugby players from five Pretoria, Gauteng high schools as participants were approached to make up the two experimental teams of the study. An initial distinction between the two groups that were to be compared existed prior to measurement. Players were either chosen or playing for their school's A-team or B-team based on selection by the schools' selection personnel. The selectors (ie coaches and/or managers) of the different schools, made the distinction of inclusion and exclusion into a specific school rugby team based on various factors. These factors are listed in Chapter 6 (Table 6.2). The researcher had no control over the selection criteria, which formed the basis for inclusion into the schools' A-team or B-teams. The researcher accepted the pre-selection of participants based on these criteria, and could not affect or influence them as gathering of data took place after the rugby season was concluded. The selection criteria information was obtained subsequent to data gathering for consideration during the interpretation of this study's findings.

For the purpose of the research study, only the 'best' players of the 'better' team were included into the study's A-team (containing only school A-team start-up players) while 'second best' players (consisting of school B-team start-up and all reserve players) were included into the study's B-team. This distinction was related to performance in as far as it was inferred that the schools selected either the best performing players to play for the first or A-team or they aspired to compile the first or A-team as the 'best' performing team (compared to the second or B-teams) through the players it contained. In terms of overall performance, the players included into the study's A-team were also only the players that played most matches for their school's first or A-team and mostly during the season as a start-up player. Included in the study's B-team were all other remaining players considered second best in terms of overall performance, indicating they played mostly for the school's second or B-team or were mostly reserve players.[3]

Performance in rugby for this study was therefore determined through the division of two teams, which implied that a player in the study's A-team was considered a better performer than a player

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[3] Participants were asked to choose which team (A-team or B-team) they played for and what type of player they were (start-up or reserve player) most of the time during the season (see questionnaire).

in the study's B-team. The study then aimed to determine the effect of emotional intelligence as predictor (ie as single predictor and in relation with other predictors, as well as its strength in terms of other predictors) on being included into the study's A-team.

4.2.4 Advantages and disadvantages of the research design

Real-life teams within the context of their real life sport situation as well as school settings were studied. The advantage of using a quasi-experimental design lies in its practical research use. Quasi-experiments are not disruptive to the real life situation in as far as it makes use of the participants at hand within their natural setting and the researcher is accepted more easily within this situation (Vogt, 2006). This may enhance generalisation of the findings to the real world. The implication of this is that research findings could be informative and useful in application to the specific situation and participants of the study, whereby both researcher and participants could gain from the research.

The disadvantages of a quasi-experimental design are the lack of control the researcher has over the experimental situation, such as random assignment, compared to true experimental designs (Dunn, 2010; Vogt, 2006). Another characteristic thereof is that the two groups compared do not constitute a true experimental and control group. Careful consideration of the relevant criteria to ensure that the two groups are 'equivalent' should therefore be undertaken. Complex designs might also not be possible to implement when using a quasi-experimental design. Quasi-experiments (as part of experimental designs in general) are weaker on external validity and therefore limited in generalisation to the population (Vogt, 2006).

4.2.5 Hypotheses

Due to the nature of the design, the researcher formulated hypotheses for testing. A quantitative approach to obtaining information was chosen and a research questionnaire used to test the hypotheses. The chosen dependent variable for the design was **performance** (in rugby), which was determined through team standing (ie being included into the A-team rather than the B-team). The dependent variable was thereby categorical. The independent variables consisted of

demographic information variables and the **various predictors of sport performance** variables constructed through the literature review and selected by the researcher. One of these predictor variables was emotional intelligence.

The research hypotheses were formulated on the basis of research questions concerning whether it could be determined if A-team rugby players, that is the best performing players, would have higher emotional intelligence scores than B-team or second best performing players. It was also to be determined what the difference between the teams would be in terms of the components or sub-scales of emotional intelligence. Finally, in terms of all the factors combined (eg demographical and predictor variables), it was to be determined on which factors/aspects the two teams would differ when compared to each other.

The first hypothesis formulated is as follows:

> **Emotional intelligence is a predictor of rugby performance** (when comparing an A-team and B-team).

The definitional formula for this hypothesis is as follows:

> **$TEQ\alpha > TEQ\beta$**

> **$TEQ\alpha$** : Total emotional intelligence for study's A-team
> **$TEQ\beta$** : Total emotional intelligence for study's B-team

In addition, the second hypothesis formulated is:

> **Emotional intelligence is a strong predictor in determining rugby performance** (compared to demographical and other predictor variables).

The definitional formula for this hypothesis is as follows:

> **$RP = f(D\beta 1 + D\beta 2 + ... + P01 + P02 + ... + E\pi 1 + E\pi 2 + ...)$**

> **RP** : Rugby performance
> **f** : Function of

Dβ : Extent of demographic variables as predictors (eg age, weight, length, heart rate before 100m sprint, heart rate after 100m sprint, time for 100m sprint, maximum weight lifted (during bench press), time practised per week (average hours), participation in rugby (number of years), participation in sport (number of years), highest education level achieved, and mark for grade passed)

P0 : Extent of physical, psychological, social and spiritual variables as predictors (eg mental toughness, motivation, focus, personal attributes and attitude, mental imagery, coaching and coach-athlete relationship, team-cohesion, talent and physical attributes, and spiritual aspects)

Eπ : Extent of emotional intelligence variables as predictors (eg self-regard, emotional self-awareness, assertiveness, independence, self-actualisation, empathy, social responsibility, interpersonal relationship, stress tolerance, impulse control, reality-testing, flexibility, problem-solving, optimism, and happiness)

Therefore rugby performance is predicted as a function of the demographic data as well as the physical, psychological, social, spiritual and emotional intelligence predictor data.

In order to test the hypotheses, the following is taken into consideration:

- **Would the A-team differ significantly from the B-team in terms of emotional intelligence?**
- **In what way would the A-team and B-team differ significantly on the questionnaire's individual items or questions?**
- **In what way would the A-team and B-team differ in terms of the demographic variables?**
- **Would the A-team differ significantly from the B-team in terms of 'other' predictors** (eg in terms of the nine physical, psychological, social and spiritual variables which include mental toughness, motivation, focus, personal attributes and attitude, mental imagery, coaching and coach-athlete relationship, team-cohesion, talent and physical attributes, as well as spiritual aspects)**?**

- **Would the A-team perform significantly better than the B-team concerning a combination of the chosen predictors** (eg the demographic and ten predictor variables of rugby performance)**?**
- **What is the (weight/strength) difference of emotional intelligence amongst these chosen predictors of rugby performance when comparing the two teams?**

4.3   SAMPLE, RESEARCH INSTRUMENT, DATA COLLECTION AND ANALYSIS

4.3.1   Sample

A convenient non-probability sampling technique to determine the sample was chosen based on the availability and willingness of rugby players to participate in the study. Non-random selection of participants took place as players were already assigned to the two groupings (eg either A-team or B-team). Therefore the original sample group consisted of 104 male participants between the ages of 15 and 19 years conveniently selected from five school rugby teams (ie Schools A, B, C, D1 and D2) of four Pretoria predominantly Afrikaans-medium high schools. Four of these teams represented the schools' first and second teams (ie Schools A, B, C and D1) and the fifth team (a team from one of the four participating schools ie School D2), represented the under 16 A-team and B-team. All participants consented to participate in the research and completed the questionnaire.

After sampling, two A-team start-up players and one B-team start-up player were eliminated from the 104 participants due to incompletion of the questionnaire (ie too many questions not answered) as well as one player who did not indicate the team he was playing for. The group thereafter consisted of 100 players from School A (N=24), School B (N=7), School C (N=20), School D1 (N=30) and School D2 (N=19). The sample was then divided into only two groups of either the A-team or the B-team. These two new teams represented the study's A-team and B-team respectively. The A-team then consisted only of A-team start-up players (N=52) and the B-team of the rest of the players (N=48).

Players from School D2 (N=19) represented a younger team and therefore being of a younger age group than those of the other four teams. In order to ensure that demographic data obtained on variables (such as weight, length, maximum weight lifted during bench press, number of years participation in rugby, number of years participation in sport in general and highest education level achieved) do not influence results because of lower aged team difference, it was decided to exclude the younger age group for final statistical data analysis purposes. Participants from the remaining 81 participants, who had provided insufficient demographic data (N=7), were also excluded. The final group thereafter consisted of 74 rugby players who had provided sufficient data to be analysed. This group included A-team start-up players (N=41), B-team start-up players (N=16), A-/B-team start-up players (N=3), A-team reserve players (N=7), B-team reserve players (N=2), an A-/B-team reserve player (N=1), A/B-team start-up/reserve players (N=2) and B-team start-up/reserve players (N=2). Only the A-team start-up players were assigned to the study's A-team (N=41) and the rest assigned to the study's B-team (N=33).

Selection by the schools' staff to determine inclusion in the first/A-team or second/B-team processed over time (± 4 to 5 months) which meant that players had already played a number of games for their teams by the time data collection took place. Members were selected for the study's A-team and B-team in terms of their position held in their school's team for most of the time during the season. Coaches and selectors used certain criteria to determine inclusion into the school's rugby team as well as being selected for the A-team rather than the B-team. Although these criteria, obtained through the Coach questionnaire (see Appendix B), were not originally intended to form part of the research study, it was utilised to provide insight for the interpretation of research findings (see Chapter 6).

4.3.2 Research instrument: The Self-evaluation Questionnaire of Sport and Sport Performance in Team Sports (Rugby) (SEQSSP-TSR)

4.3.2.1 Aim, development and layout of the questionnaire

A questionnaire was designed to obtain demographic data along with information on various predictors influencing performance amongst rugby players. Ten predictors were identified

through an in depth literature review. The questionnaire was drafted consisting of three sections: Section A - **Demographic information** (22 questions), Section B - **Physical, psychological, social and spiritual aspects related to sport performance** (62 questions) and Section C - **Emotional aspects related to sport performance** (72 questions) (see Appendix A).

Demographical information was obtained through 18 straightforward questions, either by assigning numerical or liturgical values to them while with the last four questions, indication by marking one option amongst two, were provided. The first nine predictors were, depending on the amount of their sub-components, each made up of between three and nine questions contained in Section B of the questionnaire. The tenth predictor, emotional intelligence, was based on the Bar-On EQ-i Framework. Bar-On (2006) divided emotional intelligence into five areas or domains namely, the Intrapersonal, Interpersonal, Adaptability, Stress management, and General mood domains which in turn consisted of fifteen sub-domains or competencies/skills, namely the Self-regard, Emotional self-awareness, Assertiveness, Independence, Self-actualisation, Empathy, Social responsibility, Interpersonal relationship, Stress tolerance, Impulse control, Reality-testing, Flexibility, Problem-solving, Optimism, and Happiness sub-domains. For this study, each of these sub-domains was used to compile the sub-scales of emotional intelligence. Each sub-scale consisted of between four to seven questions contained in Section C of the questionnaire. The questionnaire finally consisted of 156 questions to obtain demographical information and information on the predictors of sport performance. Predictors consisted of scales or sub-scales compiled through the combining of certain questions.

Responses to questions were based on self-reports by rugby players concerning personal demographic data obtained through open- and closed-ended questions, and the predictor data obtained through a 5-point Likert scale. The scale ranged from "1 – Strongly disagree", "2 – Disagree", "3 – Neutral/Uncertain", "4 – Agree" to "5 – Strongly agree". Participants were requested to evaluate themselves in response to their level of agreement with the predictor items or questions. Each question started with the opening statement: "I am performing at my best (for example: win a match) when …" followed by a sentence to which they had to indicate their level of agreement.

The final questionnaire was called the **Self-evaluation Questionnaire of Sport and Sport Performance in Team Sports (Rugby) (SEQSSP-TSR)**. It was designed to capture categorical or nominal, ordinal, interval, and ratio type data. According to Argyrous (1996), categorical or nominal data refers to the unit of measuring indicating a specific category, for example, the current position/jersey number in the team (which in this case could only be a number from 1 to 15). Ordinal data are ranked and ordered in terms of degree, for example, the data obtained through a Likert scale (eg 1 to 5 where 1 is lower than 5). Interval data is data that contains intervals of equal distances between their values, for example the years players participated in rugby or sport, and no true zero point exists (eg as the current year was included in the question regarding sport and rugby participation, all the players have at least participated for 1 year). The ratio type data also has equal interval distances between measurements, but with a true zero point for example the length or weight of rugby players (Argyrous, 1996).

Questions contained in the Demographic Information Section of the questionnaire were randomly decided upon according to the researcher's curiosity but also limited by excluding certain information such as race and home language. Phrasing of these questions was straightforward and was based on the definitions of the predictors as constructed through the literature review. The draft questionnaire was reviewed by one of the considered UNISA expert psychometric test evaluators, on aspects such as content and face validity, where after corrections were made before finalisation and administration thereof took place.

Initial administration to six sport participating individuals between the ages of 15 and 36 also took place to check understanding of terms, general interest, and response as well as completion time. In order to improve the design of the questionnaire aspects such as using everyday language (eg general understanding to sport participants), refraining from using double-barrelled questions, keeping questions short and ensuring they were clear, were taken into consideration for the final copy.

The initial intent of the researcher was to administer the questionnaire only to 46 rugby players from a school's first and second team. The aim was to obtain information from a complete A-team and B-team each with 15 start-up players per position and eight reserve players per position

(with the B-team's reserve player positions being similar to those of the A-team). This was, however, unattainable due to the study being voluntary and certain players being unavailable to participate. It was then decided to extend the administering of the questionnaire to a larger target group consisting of A-team and B-team rugby players from a few schools in the same geographical area.

The SEQSSP-TSR is laid out as follows:

- **Section A: Demographic information**

  This section consists of two parts with 22 items in total. The first part contains items consisting of 18 open-ended questions where participants have to complete data into a limited spaced open field. The second part of the section contains items consisting of four closed-ended dual-choice questions where participants have to choose between "yes" or "no" options.

  The demographic data obtained in this section included information about school, age, weight, length, heart rate before 100m sprint, heart rate after 100m sprint, time for 100m sprint, maximum weight lifted (during bench press), participation in rugby (number of years), participation in sport (number of years), current position in team, jersey number, highest education level achieved, mark for grade passed, team standing and type of player. Not all demographical information obtained was used in the study.

- **Section B - Physical, psychological, social and spiritual aspects related to sport performance**

  This section consists of 62 items or questions. These questions are based on a 5-point Likert scale and presented ordinal scale values and were scored as such. This section intended to measure the first nine of the ten predictors consisting of the following questions:
  - Predictor 1 (mental toughness): Questions B17, B29, B39, B43, B47 and B58.

- o Predictor 2 (motivation): Questions B1, B9, B18, B34, B44, B49 and B56.

- o Predictor 3 (focus): Questions B2, B10, B16, B32, B40, B45, B54 and B55.

- o Predictor 4 (personal attributes and attitude): Questions B3, B11, B15, B23, B26, B28, B36, B42 and B59.

- o Predictor 5 (mental imagery): Questions B7, B24, and B50.

- o Predictor 6 (coaching and coach-athlete relationship): Questions B8, B12, B27, B37, B52 and B60.

- o Predictor 7 (team-cohesion): Questions B4, B14, B21, B33, B35, B46 and B53.

- o Predictor 8 (talent and physical attributes): Questions B5, B19, B22, B25, B30, B38, B51, B57 and B61.

- o Predictor 9 (spiritual aspects): Questions B6, B13, B20, B31, B41, B48 and B62.

- **Section C - Emotional aspects related to sport performance**

This section consists of 72 items or questions. These questions are also based on a 5-point Likert scale. It presented ordinal scale values and were scored as such. This section intended to measure the tenth predictor and consisted of the following questions making up the 15 sub-scales as indicated:

- o Predictor 10 (emotional intelligence): This predictor consisted of the following sub-scales:

  - Sub-scale 1 (self-regard): Questions C1, C15, C39, C40 and C52.

  - Sub-scale 2 (emotional self-awareness): Questions C2, C14, C37, C50 and C58.

  - Sub-scale 3 (assertiveness): Questions C3, C16, C38 and C55.

  - Sub-scale 4 (independence): Questions C4, C17, C34, C51, C63 and C71.

  - Sub-scale 5 (self-actualisation): Questions C5, C33, C46 and C62.

  - Sub-scale 6 (empathy): Questions C6, C18, C35 and C49.

  - Sub-scale 7 (social responsibility): Questions C7, C21, C47, C56 and C72.

  - Sub-scale 8 (interpersonal relationship): Questions C8, C20, C31, C42, C48 and C59.

  - Sub-scale 9 (stress tolerance): Questions C9, C19, C22, C36, C41 and C60.

- Sub-scale 10 (impulse control): Questions C23, C30, C32, C43 and C54.
- Sub-scale 11 (reality-testing): Questions C11, C26, C45 and C66.
- Sub-scale 12 (flexibility): Questions C12, C29, C53, C57 and C67.
- Sub-scale 13 (problem-solving): Questions C24, C27, C64 and C68.
- Sub-scale 14 (optimism): Questions C10, C13, C28, C65 and C70.
- Sub-scale 15 (happiness): Questions C25, C44, C61 and C69.

4.3.2.2 Levels of measurement

Different levels of measurement exist when responses are quantitatively represented by numbers (Durrheim & Painter, 2006). Such levels of measurement were proposed by Stevens in 1946 (cited in Wikipedia, The Free Encyclopedia, 2007) and consist of nominal or categorical, ordinal, interval and ratio measurements.

In nominal measurement, numbers are used to indicate different categories to distinguish between persons, such as the category of gender, but without mathematical connotation between categories. This implies that the categories are used to distinguish between the groups on a specific characteristic usually indicated by the label of the category.

Ordinal measurement also indicates different categories, but differing in terms of rank (for example category 1=1 year experience, category 2=2-3 years experience and category 3=4-5 years experience). There is no mathematical calculative difference, such as addition, subtraction, multiplication and division, between categories. For instance, in the example provided, a person from category 1 has less experience than a person from category 2 (1<2), but it does not necessarily mean that a person from category 2 has twice as much experience than a person from category 1 (although 1x2=2).

Interval measurement indicates categories where there is a mathematical connotation between the categories, such as temperature and school education level. For example, when categories are assigned for school education level, the difference between category 1 (indicating grade 9) and category 2 (indicating grade 10) will be the same as between category 3 (indicating grade 11) and

category 4 (indicating grade 12). It does not however mean that a person from category 4 is twice as much educated as a person from category 2 (although mathematically 4/2=2). In interval measures ranking is meaningful and addition and subtraction can be applied (Durrheim & Painter, 2006).

Ratio measurement, for example a measurement indicating age, time, length or weight, is similar to interval measurement in as far as rank order is meaningful, but with an additional property of having a true zero value (Durrheim & Painter, 2006). Additional mathematical operations such as multiplication and division can be performed. In case of age measurement for instance, if persons ranging in age from 1 year old to 10 years old are assigned to ten categories (where category 1=1 year old, category 2=2 years old, etc), it would mean that a person from category 10, will be twice as old as a person from category 5 (10/5=2).

4.3.2.3 Scoring the questionnaire

The SEQSSP-TSR was scored as follows:

- **Section A: Demographic information**

  This section included 18 open-ended questions and 4 closed-ended questions in the form of dual-choice questions (22 in total). Questions 1 to 8 presented ratio-scale values and were scored as such. Questions 9 to 10 and 13 to 14 presented ordinal-scale values, while question 12 presented a nominal-scale value and was scored accordingly. Questions 11 and 15 to 18 presented string values (ie words) and was captured as such. Question 18 was scored additionally as categorical/nominal data ("yes"=1 and "no"=2). Questions 19, 20, 21 and 22 were scored according to the categorical/nominal data they presented ("yes"=1 and "no"=2). In order to align the data with the SPSS program all "yes"=1 and "no"=2 responses were re-coded to "yes"=1 and "no"=0.

- **Section B - Physical, psychological, social and spiritual aspects related to sport performance**

   This section's 62 items or questions were based on a 5-point Likert scale and presented ordinal scale values and were scored as such. The scores ranged between 1 and 5 and were captured as presented by participants.

- **Section C - Emotional aspects related to sport performance**

   The 72 items or questions in this section were also based on a 5-point Likert scale and presented ordinal scale values and were scored as such. The scores ranged between 1 and 5 and were captured as presented by participants. Questions C51 from sub-scale 4, C21 from sub-scale 7, and C54 from sub-scale 10 were negatively worded (in terms of high scores indicating less of the construct measured by it) to prevent response bias. The scores obtained for these three questions were reversed and recoded.

4.3.3   Data collection: Administering the questionnaire

The questionnaire was first administered to six sport-participating individuals to check face and content validity. Responses were captured and comments were incorporated to finalise the questionnaire. The final questionnaire was administered to 104 participants in total within a two-month period. Group as well as individual administering of the questionnaire took place. This meant administering the questionnaire to groups of players at a single occasion or by allowing participants to complete questionnaires individually. Instructions on how to complete the questionnaire were also provided. The data collection process took place at the end of the rugby season after the year's games were completed and prior to the December holiday break. Data collection was limited to volunteers agreeing and providing their consent for the completion of questionnaires.

After capturing and cleaning of data, specific participant responses were excluded. These responses included one participant not indicating the team he was playing for, and three others,

not completing the questionnaire in full. The remaining number of responses totalled 100 responses. These responses were originally divided into two groups namely, the study's A-team consisting of 52 school A-team start-up players and the study's B-team consisting of the 48 remaining players (being school B-team start-up players and both teams' reserve players). Certain types of data analysis techniques were performed on these 100 responses.

A further exclusion of responses took place due to inconsistent completion of Section A of the questionnaire as well as a group of players being from a younger age group (ie School D2). This resulted in the exclusion of responses from both the initial study's A-team and B-team. The final study's A-team for further analysis in the end consisted of 41 school A-team start-up players and the B-team of 33 B-team start-up players, A-/B-team start-up players, A-team reserve players, B-team reserve players, an A-/B-team reserve player, A/B-team start-up/reserve players and B-team start-up/reserve players[4]. Various types of data analysis techniques were performed on the remaining 74 responses in total.

4.3.4   Data analysis

Data for 104 participants was captured into the SPSS statistical data program and cleaned. Responses from participants who left out to many questions (N=3) or did not indicate the team they were playing for (N=1) were ignored. A total of 100 responses were then used for initial data analysis. The participants were divided into two distinguishing teams namely the study's A-team (N=52) and B-team (N=48). Various types of data-analysis were then conducted. **Descriptive** statistics were obtained from the data as well as tests for **reliability** of the scales. Exploratory **factor analysis** was performed on the scores of the 100 participants to check the interrelationship between items and predictors (consisting of scales and sub-scales) used in the questionnaire. Questions C10 and C65 were excluded from their respective sub-scales for reliability and factor analysis of the total group (N=100) as these two questions were changed for the final version of the questionnaire and by mistake the older version was administered to too many participants (N=19).

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[4] Some players indicated they played for both teams (eg A-/B-team start-up player). If respondents did not indicate they were mostly only an A-team start-up player, their responses were assigned to the study's B-team.

After finalisation of the scales the large group was reduced to 74 participants and divided into an A-team (N=41) and B-team (N=33). Data descriptive and analysis techniques were used to compare the two teams concerning demographical data as well as scores obtained on the ten predictors used in this study, which were then interpreted in terms of rugby performance.

The three main types of SPSS data analysis methods used were non-parametric statistical techniques of the **Mann-Whitney Test** and **Spearman's Rank Order Correlation** as well as **Logistic Regression** (utilising the Binary Logistic procedure). Through these methods the relationship between the team standing (A-team or B-team) as dependent variable was compared with demographic and predictor data as independent variables. Interpretation took place according to the output information received from the descriptive statistics, reliability test, factor analysis, non-parametric statistics and Logistic Regression analysis (which included model-, goodness of fit-, model usefulness-, model predictability-, variable significance-, and the odds ratio test statistics).

4.3.4.1 Descriptive statistics

Descriptive statistical analysis for both groups (N=100 and N=74) were performed on the categorical and continuous demographical data collected by using the 'Frequencies' and 'Descriptives' functions in SPSS. Further descriptive statistical analysis took place by using the 'Explore' and 'Crosstabs' functions in SPSS. Descriptive statistics obtained included the number of participants per demographical variable, the range (minimum and maximum), mean, standard deviation, and indication of normality of distribution (ie the skewness and kurtosis). Indications of age, weight, length, heart rate before 100m sprint, heart rate after 100m sprint, time for 100m sprint, maximum weight lifted (during bench press), time practice per week (hours), participation in rugby (number of years), participation in sport (number of years), highest educational level achieved (or grade passed), and mark for grade passed (or highest educational level achieved) were extracted.

Descriptives also included averages for age, weight, length, time practice per week (hours), participation in rugby (number of years) and mark for grade passed (or highest educational level achieved) per school. The totals per school of position in team, team representation (ie A-team or B-team player), and type of player (ie start-up or reserve player) were also obtained. In addition, differences between the A-team and the B-team as well as between start-up and reserve players of the study on certain demographical information provided were obtained. Descriptive statistics results are presented in Chapter 5.

4.3.4.2 Reliability analysis

Reliability of scales indicate how free they are from random error and/or the degree to which items making up the scales measures the same attribute (Pallant, 2006). A test for reliability of the scales used in the study was done by determining the Cronbach Alpha values. Reliability is indicated through Cronbach Alpha values ranging between 0 and 1 with values closer to 1 indicating a high average correlation and therefore reliability between items.

It is suggested that ideally, the Cronbach Alpha value should be above 0,70 but because it is sensitive to the number of scale items, lower values could be found. When scales with fewer than ten items are used (such as in this study), it would be more appropriate to consider inter-item correlation acceptable between 0,20 and 0,40 (Pallant, 2006). For this study it was decided to accept scales and sub-scales with Cronbach Alpha values above 0,50 and inter-item correlations of above 0,25 but below 0,90.

Exploratory reliability analysis was performed on the items or questions that make up the scales for each of the first nine predictors (Section B) and the sub-scales making up the tenth or emotional intelligence predictor (Section C) (N=100). As a result of the findings, reliability analysis was then performed on the sub-scales making up the motivation, focus and spiritual aspects predictors to explore Cronbach values and inter-item correlations[5]. Results obtained

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[5] Some of the first nine predictors consisted of sub-constructs or sub-scales which when combined made up the predictor scales.

necessitated elimination of certain questions underlying the predictor scales in order to re-construct the predictors for further analysis.

Results obtained from the reliability analysis performed on the emotional intelligence sub-scales also necessitated elimination of underlying questions to certain sub-scales and to re-perform reliability analysis on them. The applicable sub-scales included the independence, social responsibility and impulse control sub-scales. The reliability analysis results are presented in Chapter 5.

Reliability analysis resulted in the finalisation of the predictors to be used in the study. The finalised predictors consisted of scales (predictors 1 to 8), sub-scales (predictor 10) and individual questions (predictor 9a, 9b and 9c). A list of the predictors used in the study is provided in Table 5.12 along with scale and sub-scale Cronbach Alpha values and number of items or questions used to make up the predictors. Inclusion of scales and sub-scales were based on the criterion for Cronbach values to be above 0,50 and inter-item correlations above 0,25. The finalised predictors would then be applied to the sample group of 74 respondents. Reliability of the questionnaire (Section B and C) was tested by performing reliability analysis on all these predictors. Reliability analysis results also influenced the use of factor analysis.

4.3.4.3 Factor analysis

Factor analysis was performed to explore the relationship between the various **finalised predictors** contained in Section B and Section C of the questionnaire. The **Principal Component Analysis** technique with **Varimax Rotation Method** in SPSS was used in this regard. Exploratory factor analysis took place on the data of the group of 100 participants with the aim to investigate the relationship between the predictors as viewed by the larger group. By using factor analysis, exploration of the possibility to reduce a large set of variables (or predictors) to a smaller set of variables (or predictors) that fit together, could be considered (Pallant, 2006). One could then select the most suitable predictor variables for further analysis.

Formal factor analysis was performed on the data of the group of 74 participants to determine whether new (more coherent) predictors could be constructed in reducing the number of predictors, for later use during Logistic Regression analysis. Indication for the number of factors to be extracted was provided through Kaiser's criterion (or eigen value rule) to only retain factors with an eigen value of 1. Scree test results were also considered in this regard, by accepting the plotted eigen values of the factors above the point where the curve changes direction and becomes horizontal (Pallant, 2006).

Parallel analysis can be used as an additional technique to factor analysis. According to Pallant (2006), this analysis technique enables a researcher to determine more accurately the number of components or factors to be retained by comparing parallel analysis eigen values with those obtained from SPSS. Her suggestion to retain only the factors with eigen values from the SPSS output exceeding those attained through parallel analysis, was followed in this study. Parallel analysis was performed through utilising the Monte Carlo PCA for Parallel Analysis program developed by Marley Watkins. This type of analysis technique could be performed on the larger group (N=100) but not on the sample group (N=74) as a minimum of 100 subjects were required.

Results from the exploratory factor analysis performed on the larger group (N=100) lead to the decision to perform formal factor analysis separately on the finalised predictors contained in Section B and the one contained in Section C of the questionnaire for the sample group (N=74). SPSS results were then used to indicate the number of factors to be retained. By extracting this fixed number of factors, predictor combinations (based on the extraction) were constructed for use in the Logistic Regression analysis.

4.3.4.4 Non-parametric statistics

Parametric statistics are normally used in analysing variables measured on the interval and ratio scales and non-parametric statistics for variables measured on the nominal and ordinal scales (Durrheim & Painter, 2006). According to Pallant (2006), non-parametric techniques are used to compare two groups existing of smaller samples especially when data used do not meet the strict assumptions of parametric techniques. Non-parametric techniques cannot be used for making

assumptions about the underlying population distribution. It is mainly a less powerful and sensitive technique than parametric techniques and it may not be able to detect actual differences existing between groups (Pallant, 2006). For this study the Mann-Whitney Test as well as Spearman's Rank Order Correlation where used to analyse data further.

- **Mann-Whitney Test**

The Mann-Whitney Test (also referred to as the Mann-Whitney U Test) is used for determining the difference between two independent groups concerning a continuous variable (Pallant, 2006). The two independent groups in this study were the A-team and the B-team. Some of the demographic information obtained from participants contained continuous variable data such as age, weight, length, time for 100m sprint, maximum weight lifted during bench press, average time practised per week, number of years participation in rugby, number of years participation in sport in general, highest education level achieved or grade passed, and mark for grade passed.

Scores obtained through each question contained in Section B and Section C of the questionnaire, were coded as continuous variables. The scores of questions used in combination with other questions to form the scales and sub-scales of the predictors of the study, were calculated. This was achieved by adding scores from each question contained in the scale or sub-scale and dividing them by the amount of questions used. This resulted in producing average scores presented in the same format (ie Likert-scale format ranging from 1 to 5) as received through individual question responses.

By utilising the Mann-Whitney Test ('2 Independent Samples Test' in SPSS), **the A-team and the B-team** were firstly compared with regards to almost all **questions** contained in the questionnaire (excluding certain questions which were ignored due to reliability analysis results) for analysis purposes. Thereafter, a comparison concerning the **sub-scales of the predictors** as well as **the predictors themselves** took place. The Mann-Whitney test was the analysis method chosen mainly to test for significant difference between the A-team and B-team in terms of emotional intelligence, thereby testing the

hypothesis suggesting that emotional intelligence is a predictor of rugby performance. It presented very interesting results in terms of all the comparisons made (see results in Chapter 5).

- **Spearman's Rank Order Correlation**

Spearman's Rank Order Correlation (rho) is the non-parametric alternative to the parametric Pearson's Product-Moment Correlation technique. It is used for determining the strength of a relationship between two continuous variables (Pallant, 2006). In this study, scores obtained through the scales and sub-scale making up the predictors, as well as scores for predictors measuring physical, psychological, social, spiritual and emotional aspects related to sport performance, were coded as continuous variables. Spearman's Rank Order Correlation ('Bivariate Correlation Analysis' in SPSS) was therefore performed on certain **particular variables** in order to determine the strength of a possible relationship between them (see Chapter 5).

4.3.4.5 Construction of predictor models

After reliability analysis, new predictors emerged through the re-construction of scales and sub-scales making up the predictors. The SPSS factor analysis results output indicated certain components on which the predictors grouped together. These groupings were considered along with the results of the non-parametric statistical analysis methods to determine predictor models. The combination of predictors as models for the study took place and was intended for use during the Logistic Regression analysis. The researcher was compelled to make use of the models because of the Logistic Regression analysis technique requirements (specifying cases per variable), thereby limiting the quantity of predictor variables to be used in the definitional formula for the second hypothesis. These predictor models were used in testing the study's second hypothesis.

All the original predictors, in terms of the literature review constructs, were retained, although the spiritual aspects predictor was divided into three separate predictors each measuring a specific

aspect of the original predictor. Furthermore, certain questions were eliminated for use in the scales or sub-scales of some of the predictors. Although the study aimed to utilise the predictors to test the hypotheses, consideration of all the questions of the questionnaire during non-parametric statistical data analysis would become very useful especially for analysing and interpreting results.

4.3.4.6 Logistic Regression

The last method chosen for analysing the data was the Logistic Regression analysis method (see Chapter 5). According to Vogt (2006) this method is used when the dependent variable is categorical (in this study performance determined by being in either the A-team or the B-team) and the independent variables, multinomial (such as in this study consisting of demographical variables and predictors measuring physical, psychological, social, spiritual and emotional aspects related to sport performance).

Logistic Regression has two main uses, namely to predict group membership and to explore the relationship and strengths among the variables used (Lani, 2009). According to Lani (2009), **Binary Logistic Regression** is used when there are two dependent variable categories and it was therefore applied in this research study. Part of the prediction of group membership, includes the odds or chances of being included into the group.

For example, in this study a group of 74 participants were assigned to two groups consisting of 41 A-team players and 33 B-team players. The proportion of A-team players are therefore 41/74=0,554 (or 55,40%) and the proportion of B-team players 33/74=0,446 (or 44,60%). The proportion of players is also the probability of being included/excluded from the team. When using two mutually exclusive categories (in the study's case being in the A-team indicated by "yes" or not being in the A-team – and therefore B-team – indicated by "no"), the probability of being in one category would be 1 minus the probability of being in the other category (eg 0,55 = 1 – 0,45). This is true due to the fact that proportions or probabilities add up to 1 (Vogt, 2006).

Odds of being included into the study's A-team and not the B-team can be expressed through the Logistic Regression S-shaped curve (see Figure 4.1), or cumulative standard normal distribution and indicated as the log of the odds or logit (Vogt, 2006).
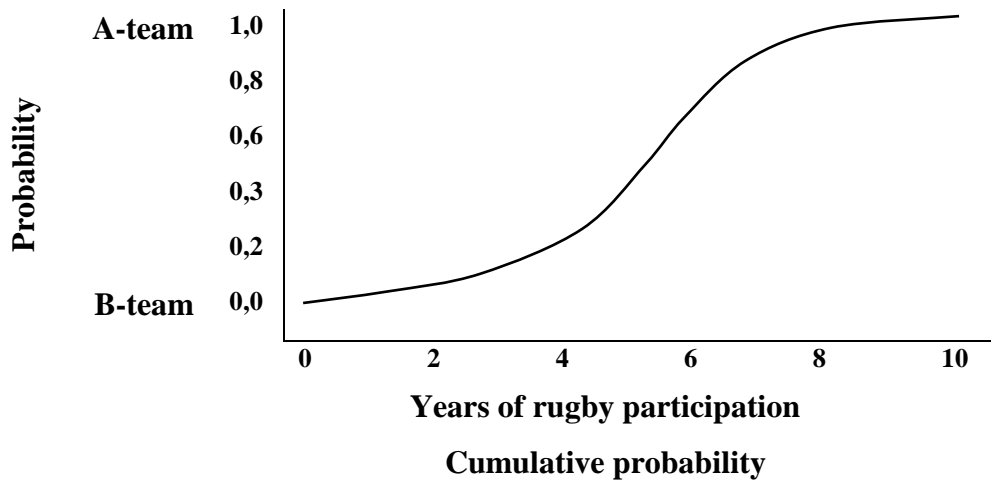
Figure 4.1 Logistic Regression S-shaped Curve (Vogt, 2006)

In the hypothetical example provided, the longer a person participates in rugby the better his changes are of being included in the A-team. A person's chances of being included in the A-team gradually increases when participating in rugby for up to 4 years. If a person has been participating for between 4 and 6 years, his chances rapidly increase. After 6 years of participation, a person's chances gradually decrease again.

Vogt (2006) theorizes that the log of the odds is an expression of the effects on the dependent variable. Results from the Logistic Regression method are presented as a regression coefficient, Exp (B), or the exponent of the regression coefficient, indicating the odds ratio. For example, if the Exp (B) is 1, it implies no effect (odds being 1:1 or 50:50) and if it is 2, the odds are twice as high (or 2:1). Further conclusions can be made, for example, if Exp (B)=1,5, the chances of being included into the A-team are 50% higher (the odds being 1,5:1). By obtaining a negative coefficient (as in ordinary regression) an increase in the independent variable lowers the odds of the dependent variable. If however, the Exp (B) is <1, for example Exp (B)=0,39 the chances of

being included into a group are lower (in this case 52,3 % lower chances of being in the A-team due to the 47,7% higher chance of being in the B-team)[6].

Odds ratio (OR) can then be used to determine the ratio between two odds (for instance when two groups such as men and women are compared to being included in either of the two teams). For instance, two groups (male and female) of 74 rugby players each consist of 41 male and 38 female A-team players each and 33 male and 36 female B-team players (see Table 4.1). What would the odds be for the males and females to be included into the A-team? The odds for males being in the A-team are 41/33=1,242 and for females 38/36=1,056. The OR males to females would therefore be 1,242/1,056=1,176. This means that for this sample the odds of males being A-team players are 1,176 times the odds of females being A-team players. The OR males to females for the B-team would be 0,805/0,947=0,85. This implies in the example that the odds of males being B-team players are 0,85 times the odds of females being B-team players. In regression coefficient or Exp (B) terms, it implies females have a 134% bigger chance than the males of being in the B-team[7].

Table 4.1   Male and female players by team standing (N=74)

Participants	A-team	Proportion or probability	Odds	B-team	Proportion or probability	Odds	Total
Men	41	0,554	1,242	33	0,446	0,805	74
Women	38	0,514	1,056	36	0,486	0,947	74
TOTAL	79			69			148

Only a limited number of responses (N=74) selected from the total sample group of 100 could be used for the Logistic Regression analysis as explained previously. According to Hosmer and Lemeshow (cited in Garson, 2010), the recommended sample size when using logistic regression, is ten cases per independent variable. In this study, the recommendation would imply that only seven variables at a time could be used to test the second hypothesis and thus be included in the

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[6] Percentage is calculated by taking the exponent (e^x) of 0,39 which is 1,477 meaning the odds being 1,477:1. Subtract 47,7% from 100% to obtain 52,3%.

[7] Exponent (e^x) of 0,85 is 2,34 indicating the odds being 2,340:1. Add 34% to 100% to obtain 134%.

definitional formula. The researcher decided to make use of a number of models compiled through different combinations of the variables from the three categories and consisting of seven variables each in order to test the second hypothesis.

For this study, the independent variables were divided into three main categories namely: a) **demographic information** variables; b) **physical, psychological, social and spiritual aspect** variables; and c) **emotional aspects** variables (or **emotional intelligence**). Logistic Regression was the analysis method chosen to test the hypothesis, which regarded sport performance as a function of the sum of variables from these three categories. These variables formed the independent variables of the study and originally consisted of nine demographic information variables, nine predictor variables (constructed through scales and measuring physical, psychological, social and spiritual aspects related to sport performance), and one predictor variable (regarded as the emotional intelligence predictor variable constructed through 15 sub-scales and measuring emotional aspects related to sport performance). In total 33 variables existed originally. Through reliability analysis the physical, psychological, social, spiritual and emotional aspects variables have been adapted and changed but remained to be named as before (except for the spiritual aspects variables).

Six of the original intended nine demographic information variables consisting of: a) **age**; b) **weight**; c) **length**; d) **time practised per week** (average hours); e) **participation in rugby** (number of years); and f) **mark for grade passed** were retained. These variables were used individually in the model combinations as demographic predictors.

The physical, psychological, social and spiritual variables consisted of **mental toughness**, **motivation**, **focus**, **personal attributes and attitude**, **mental imagery**, **coaching and coach-athlete relationship**, **team-cohesion**, **talent and physical attributes**, **spiritual aspects (religious), spiritual aspects (purpose and meaning)** and **spiritual aspects (higher state)** as predictors and were used individually in five of the model combinations. **Total physical, psychological, social and spiritual competence** was calculated by combining these predictor scores and dividing them by the quantity of predictors. This calculation produced an average

score similar to the original Likert-scale format (ie score ranging between 1 and 5). This competence was used as an individual predictor in the second last model combination.

Emotional intelligence consisted of the 15 sub-scales, namely, **self-regard**, **emotional self-awareness**, **assertiveness**, **independence**, **self-actualisation**, **empathy**, **social responsibility**, **interpersonal relationship**, **stress tolerance**, **impulse control**, **reality-testing**, **flexibility**, **problem-solving**, **optimism** and **happiness** and were used as individual predictors in five of the model combinations. **Total emotional intelligence competence** was calculated by combining all sub-scale scores and dividing them by the quantity of sub-scales producing an average score similar to the original Likert-scale format (ie score ranging between 1 and 5). This competence was used as an individual predictor in the second last model combination.

Factor analysis of responses (N=74) suggested the combination of mental toughness, talent and physical attributes, personal attributes and attitude, motivation, focus, team-cohesion and spiritual aspects (religious) as component 1 which for the study was called **other predictors 1**. Mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state) and coaching and coach-athlete relationship was suggested to combine as component 2 and for the study was called **other predictors 2**. These two new groupings were used in one of the model combinations.

Factor analysis performed on responses (N=74) to the sub-scales making up the emotional intelligence predictor suggested all variables loading on two components. It was decided to remain with two components as suggested by the SPSS factor analysis output due to the total variance explained after rotation (see Chapter 5). SPSS results suggested the combination of assertiveness, self-actualisation, empathy, social responsibility, independence, emotional self-awareness, reality-testing, impulse control, interpersonal relationship and problem-solving as component 1 which for the study was called **emotional predictors 1**. Happiness, optimism, self-regard, flexibility and stress tolerance was suggested to combine as component 2 and for the study was called **emotional predictors 2**. These two new groupings were used in the model combination containing other predictors 1 and other predictors 2.

A total of 38 variables were used as predictors in eight predictor model combinations. Testing for **multicollinearity** between predictors took place using the **Linear Regression Analysis Collinearity Statistics from the Coefficients table in SPSS**. A final model combination was created based on **Spearman's rho Correlation** between the independent variables or predictors and the dependant variable being significant at the 0,01 level (2-tailed) (r>0,30) and the 0,05 level (2-tailed) (r≥0,24).

The **Forced Entry Method** of the **Logistic Regression Analysis in SPSS 17.0** was used to test the models. Test statistics from the output received and used for interpretation of data included the **model correctly classified cases test** (indicated by the 'Block 0 Classification' table), **model performance or goodness of fit test** (indicated by the 'Omninbus Test of Model Coefficients' and the 'Hosmer and Lemeshow Test' containing chi-square and significance values), **model usefulness** (indicated by 'Nagelkerke R Square' value in the 'Model Summary' table), **model predictability test** (indicated by the 'Block 1 Classification' table), **variable contribution test** (indicated by the 'Variables in the Equation' table), and the **odds ratios test** (provided by the Exp (B) column in the 'Variables in the Equation' table).

4.4   VALIDITY AND RELIABILITY

4.4.1   Validity

Validity refers to the accuracy of the measurement used in research (Vogt, 2006). Therefore, is the measuring instrument measuring what it is supposed to measure (content validity) and would the conclusions made from the research be valid?

Face validity in this study was ensured through expertise scrutinising of the measurement instrument by one of the UNISA lecturers with a PhD qualification and considered an expert in the field of test development. Original testing on six randomly selected sport participating individuals (15 years and older) took place to check if questionnaire items are generally clearly understood, time allocated to complete the questionnaire is sufficient, and participants are

persistent in completing the questionnaire in full. Comments provided by them were then incorporated in the measurement instrument to further ensure face and content validity.

To ensure construct validity (or the extent to which the measuring instrument measures theoretical constructs), questions were constructed according to definitions presented from literature. The emotional intelligence measuring part of the questionnaire was based on the Bar-On EQ-i structure layout.

Validity of the measuring instrument was further pursued by phrasing questions in such a manner as to ensure that they are relevant, pertain to the sport rugby, and avoid complicated constructs. As far as possible leading, vague, double-barrelled, negatively phrased and double negative questions were avoided, to warrant validity.

The validity of model 6 used in the study was optimilised through factor analysis by combining the study's predictors according to the groupings suggested by SPSS. The grouping of these predictors took place in accordance to the amount of factors extracted and were used as alternative predictors (see Chapter 5).

4.4.2 Reliability

Reliability refers to the consistency of the measurement to be undertaken (Vogt, 2006). Therefore, is the instrument reliable in measuring the phenomena under investigation? Do the test results provide a true reflection of the respondents' perceptions concerning the phenomena under investigation? Reliability was pursued through ensuring that variables or constructs were well defined.

The Cronbach Alpha coefficient was used as an indicator of the reliability of the questionnaire scales and predictors specifically in terms of internal consistency or measurement of consistency with regard to content sampling. Cronbach Alpha values of above 0,70 were considered indicative of questionnaire reliability and with a smaller sample (as in this study's case) inter-item correlations between scales (or predictors) above 0,20 (Pallant, 2006).

Reliability testing was performed on the finalised predictors for use in the analysis of data consisting of scales and sub-scales as re-constructed through reliability analysis performed on individual predictors. For all 26 predictors contained in Section B and Section C of the questionnaire the Cronbach-Alpha coefficient for the sample group of 74 participants was 0,943 with inter-item correlations ranging from 0,258 to 0,812. The reliability test results therefore provided support for the questionnaire containing the predictors being reliable and suitable for use in the study.

4.5 LIMITATIONS

One of the main limitations of this study was that data was gathered from an exclusive group of participants consisting of male high school rugby players from selected predominantly Afrikaans-medium high schools in the Pretoria region of Gauteng, South Africa, and therefore generalisation of findings could not be assumed. Furthermore, a fairly small sample of participants (N=74) was used for final data analysis, which meant that results obtained could only be applicable to the specific sample. Such a limitation need not necessarily be disadvantageous, as the findings could be useful to the specific schools in highlighting certain issues relevant to rugby performance and previously unknown to them.

The use of a quasi-experimental design, compared to a true experimental design, also limited the researcher to generalise the findings. This design was required, as lack of random assignment of participants could not take place due to the pre-assignment of participants to the two groups under study, as well as the voluntary nature of participation.

Furthermore, the study was limited in the predictor variables used to determine rugby performance, which meant that certain other unmeasured predictors that also could influence rugby performance, were excluded. On the other hand, the advantage of this study was that a number of predictors for determining rugby performance were used, and not just only a few.

The use of the chosen analysis techniques such as the non-parametric and Logistic Regression techniques, also limited study findings and conclusions. Non-parametric techniques may be less sensitive and powerful than parametric techniques and could also fail to detect actual existing differences between groups (Pallant, 2006). The nature of the study compelled the researcher to make use of these techniques as the sample was fairly small, not normally distributed, and the dependent variable was categorical.

The use of the Logistic Regression technique on the sample size limited the study in its use of all the chosen variables in the definitional formula due to the prescribed recommendation of cases per independent variable. This compelled the researcher to make use of restricted models in testing the second hypothesis of the study and thereby limiting him to conclude what the true influence of emotional intelligence as predictor is along with all other physical, psychological, social and spiritual predictors used.

A further limitation of the study was the use of a newly constructed questionnaire, which has not yet been standardised. This limitation could be eliminated through further studies on the standardisation of such a measuring instrument for practical use in predicting rugby performance amongst South African rugby players.

4.6   ETHICAL CONSIDERATIONS

The research aim, purpose and background were verbally and non-verbally in the form of the consent form (see Appendix C) presented to participants, coaches, team managers, and/or relevant role-players such as the school principal. Informed consent forms for signing by participants and parents/legal guardians were issued prior or simultaneous with questionnaires depending on group- or self-administering thereof. This was provided to ensure participants and their parents or legal guardians (because certain participants were younger than 18 years of age) are familiar with and acknowledge: a) their rights with regards to freedom of participation; b) background, procedures and safeguards to the study; and c) contact particulars of the researcher and supervisor for further information.

Voluntary participation, with the option to withdraw at any time as laid out in the consent form, was provided. Also, anonymity with completion of the questionnaire and confidentiality through safeguarding of completed questionnaires were promised and ensured and were to be maintained during the study as well as even after study results were disseminated. Non-maleficence was further ensured by not exposing participants individually or publicly, and keeping personal identity intact.

Beneficence to participants, schools and team coaches or managers would be achieved by providing proper feedback and making test results available as offered and when required once finalised.

4.7 CONCLUSION

The study's aim was to determine the effect of emotional intelligence in relation to other predictors and demographical information on rugby performance. Through the chosen methodology, the researcher could test the relevant hypotheses. Steps were followed in arriving at the most appropriate measurement of predictors influencing rugby performance as provided by the chosen participant sample group. A few models were used in determining the effect of emotional intelligence in relation to demographical and other physical, psychological, social and spiritual predictors. The results obtained will be discussed in Chapter 5.

CHAPTER 5

RESULTS

5.1   INTRODUCTION

Data analysis of responses captured and cleaned in the SPSS statistical data analysis program (version 17.0) took place as described in Chapter 4. The original sample size consisted of 104 respondents, which after cleaning consisted of 100 respondents. Initial analysis of these responses was conducted as exploratory measure where after the total group was trimmed to 74 respondents as the final sample group. The results obtained from the data analysis will be described in this chapter according to descriptive statistics, reliability analysis, factor analysis, non-parametric statistics and Logistic Regression analysis outputs. This will be done by reporting on the research findings emanating from the methodology followed in this research study.

5.2   RESEARCH FINDINGS

5.2.1   Descriptive statistics

The output obtained in SPSS indicated that not all of the 100 participants completed the demographical information in Section A of the questionnaire in full (N ranging from 35 to 100). Results for the 100 respondents are presented in Table 5.1. Respondents' ages ranged from 15 to 19 years, with a mean of 16,95 and standard deviation of 1,137. Average weight amongst players was 84,66 kilograms (ranging from 63 kilograms to 114 kilograms), and average length 1,83 metres (ranging from 1,67 metres to 2 metres). The average weight lifted, as an indication of strength, was 92,74 kilograms (ranging from 30 kilograms to 155 kilograms).

The average heart rate before 100m sprint was 64,58 and after 100m sprint 105,20. The fastest time for 100m sprint, as indication of speed, was 10,70 seconds and the slowest 15 seconds. The average time for 100m sprint was 12,31 seconds. Time practice per week ranged between 2 and 20 hours with an average of 8,72 hours. The average years of participation in sport in general was

11,04 years and that of rugby 10,61 years. The average mark for the highest school education level passed was 69,84%.

TABLE 5.1 Descriptive statistics: Total group of participants (N=100) per demographic variable

Demographic variable	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
Age in years	99	15,0	19,0	16,95	1,137	-0,622	0,243	-0,764	0,481
Average weight in kilograms	100	63,0	114,0	84,66	10,968	0,476	0,241	-0,154	0,478
Length in centimetres	97	167,0	200,0	182,70	7,116	0,049	0,245	-0,326	0,485
Heart rate before 100m sprint	38	40,0	100,0	64,58	12,890	166,142	1,011	0,383	1,103
Heart rate after 100m sprint	35	50,0	190,0	105,20	34,436	1185,812	0,932	0,398	0,461
Time for 100m sprint in seconds	89	10,7	15,0	12,31	0,935	0,653	0,255	-0,231	0,506
Maximum weight lifted by bench press in kilograms	77	30,0	155,0	92,74	24,468	-0,256	0,274	0,161	0,541
Average hours time practice per week	97	2,0	20,0	8,72	3,469	1,004	0,245	1,887	0,485
Years participation in rugby	98	5,0	18,0	10,61	1,629	0,358	0,244	4,316	0,483
Years participation in sport	94	8,0	18,0	11,04	1,691	0,887	0,249	2,466	0,493
Highest school grade passed	85	8,0	11,0	10,41	0,863	-1,483	0,261	1,491	0,517
Mark for grade passed average total	96	48,0	100,0	69,84	10,863	0,455	0,246	-0,055	0,488

Weight (N=100; mean=84,66; SD=10,968), length (N=97; mean=182,70; SD=7,116), and heart rate before 100m sprint (N=38; mean=64,58; SD=12,890) were the only demographic variables resembling a normal distribution observed through inspection of the skewness and kurtosis columns as well as histograms confirmed by the Kolmogorov-Smirnov statistic in SPSS.

Again not all of the final sample of 74 participants completed the demographical information in Section A of the questionnaire in full (N ranging from 22 to 74). Results for the 74 respondents

are presented in Table 5.2. Respondents' ages ranged from 16 to 19 years, with a mean of 17,42 and standard deviation of 0,702. Average weight amongst players was 86,14 kilograms (ranging from 63 kilograms to 110 kilograms), and average length 1,83 metres (ranging from 1,69 metres to 2 metres). The average weight lifted, as an indication of strength, was 96,78 kilograms (ranging from 30 kilograms to 155 kilograms). The average heart rate before 100m sprint was 61,81 and after 100m sprint 103,18. The fastest time for 100m sprint was 10,70 seconds and the slowest 14 seconds. The average time for 100m sprint was 12,17 seconds. The time practice per week ranged between 2 and 20 hours with an average of 8,39 hours. The average years of participation in sport in general was 11,52 years and that of rugby 10,97 years. The average mark for the highest school education level passed was 67,80%.

TABLE 5.2 Descriptive statistics: Final group of participants (N=74) per demographic variable

Demographic variable	N	Min.	Max.	Mean	Std. Dev.	Skewness		Kurtosis	
	Stat.	Stat.	Stat.	Stat.	Stat.	Stat.	Std. Error	Stat.	Std. Error
Age in years	74	16,0	19,0	17,42	0,702	-0,313	0,279	-0,335	0,552
Average weight in kilograms	74	63,0	110,0	86,14	10,495	0,305	0,279	-0,306	0,552
Length in centimetres	74	169,0	200,0	183,05	7,142	0,127	0,279	-0,298	0,552
Heart rate before 100m sprint	26	48,0	87,0	61,81	9,239	1,290	0,456	1,779	0,887
Heart rate after 100m sprint	22	61,0	162,0	103,18	28,441	0,734	0,491	-0,329	0,953
Time for 100m sprint in seconds	68	10,7	14,0	12,17	0,866	0,689	0,291	-0,193	0,574
Maximum weight lifted by bench press in kilograms	65	30,0	155,0	96,78	22,339	-0,231	0,297	0,826	0,586
Average hours time practice per week	74	2,0	20,0	8,39	3,210	0,787	0,279	2,157	0,552
Years participation in rugby	74	5,0	18,0	10,97	1,630	0,123	0,279	5,935	0,552
Years participation in sport	71	8,0	18,0	11,52	1,593	1,051	0,285	3,521	0,563
Highest school grade passed	69	9,0	11,0	10,64	0,542	-1,148	0,289	0,346	0,570
Mark for grade passed average total	74	48,0	89,0	67,80	9,435	0,186	0,279	-0,255	0,552

Weight (N=74; mean=86,14; SD=10,495), length (N=74; mean=183,05; SD=7,142), heart rate after 100m sprint (N=22; mean=103,18; SD=28,441), and mark for grade passed average total (N=74; mean=67,80; SD=9,435) were the only demographic variables with a normal distribution observed by inspecting the skewness and kurtosis columns along with histograms confirmed by the Kolmogorov-Smirnov statistic in SPSS.

Further descriptive statistics considered included averages of age, weight, length, time practice per week, number of years participating in rugby, and total average mark for highest education level (or grade passed) per school. Again statistics for the 100 respondents and 74 respondents were produced via SPSS. The results for the 100 respondents are presented in Table 5.3.

TABLE 5.3 Descriptive statistics: Total group of participants (N=100) per school: Averages

School	Number of players	Age (in years)	Weight (in kilograms)	Length (in centimetres)	Time practice per week (in hours)	Rugby partici-pation (in years)	Total mark for grade passed (in %)
A	24	17,57	82,08	179,46	7,98	10,63	64,30
B	7	16,86	84,00	185,83	10,93	10,71	71,43
C	20	17,50	89,30	185,10	7,45	10,94	66,39
D1	30	17,37	86,93	184,13	8,87	11,17	69,83
D2	19	15,00	79,68	180,79	10,03	9,37	79,78
TOTAL	**100**	**16,95**	**84,66**	**182,70**	**8,72**	**11,04**	**69,84**

School D1 had the most participants (N=30) and School B the least (N=7). Participants from School D2 were the youngest (all 15 years old) and had the highest average total mark for grade passed (79,78%). School B's participants on average were the tallest (1,85 metres), and practiced longer per week (10,94 hours), compared to the other schools. School C presented participants who were on average heavier (89,30 kilograms) and who had more years of participation in rugby (10,93 years), compared to the other schools. The participants of School A were slightly older than the rest (17,57 years).

The results for the 74 respondents are presented in Table 5.4. Statistics for School D2 were not included as these participants were excluded from the study's final sample group as explained in

Chapter 4. School D1 in this case still had the most participants (N=30) and School B the least (N=6). Participants from School B had the highest average total mark for the grade passed (71,67%), were on average the tallest (1,85 metres), practised longer per week (9,67 hours) and were younger in age (16,83 years), compared to the other schools. School C presented participants who were on average heavier (90,13 kilograms) than the other schools. School D1's participants had more years of rugby participation (11,17 years), compared to the other schools. The participants of School A were slightly older than the rest (17,59 years).

TABLE 5.4 Descriptive statistics: Final group of participants (N=74) per school: Averages

School	Number of players	Age (in years)	Weight (in kilograms)	Length (in centimetres)	Time practice per week (in hours)	Rugby participation (in years)	Total mark for grade passed (in %)
A	22	17,59	82,45	179,45	8,11	10,82	64,41
B	6	16,83	85,00	185,83	9,67	10,50	71,67
C	16	17,50	90,13	184,94	7,41	11,00	67,19
D1	30	17,37	86,93	184,13	8,87	11,17	69,83
TOTAL	**74**	**16,95**	**84,66**	**182,70**	**8,72**	**11,04**	**69,84**

For interest sake, the totals per school of school rugby team representation (ie A-team or B-team player), and type of player (ie start-up or reserve player) were also obtained for both the 100 and 74 respondent groups. The results are presented in Table 5.5. In the table, the player positions of respondents from the different schools' A- rugby team and B- rugby team are provided. Each team was fairly equally represented by A-team and B-team players. School D1 represented a complete A-team and B-team with 15 players each. Some positions (eg numbers 1, 3, 6, 7, 11 and 13), however, did not reflect the usual two positions normally associated with an A-team and a B-team. These responses could be explained by players playing in alternative positions during the season but still within the same team.

Difference in the statistics between A-team or B-team position and start-up or reserve player type can be explained by certain members being reserves for their school's A-team and others start-up players for the B-team. In total, both groups consisted of more A-team (N=52 and N=41) than B-team players (N=48 and N=33). Most participants for both groups were start-up players (N=83 and N=64) with lesser players being reserve players (N=17 and N=10).

TABLE 5.5 Descriptive statistics: Total and final group of participants (N=100 and N=74) per school: Player position, team representation, and type of player

School	N	Player position															Team		Player type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	A	B	Start-up	Reserve
A	24	2	2	1	1	2	1	1	2	2	2	1	2	3	1	1	14	10	23	1
B	7	0	0	1	1	2	0	1	0	0	0	0	0	1	0	1	3	4	6	1
C	20	1	2	2	2	0	2	1	1	1	1	2	1	1	1	2	11	9	17	3
D1	30	3	2	1	2	2	1	3	2	2	2	3	2	1	2	2	15	15	22	8
D2	19	2	1	2	1	1	3	3	4	0	0	0	0	1	1	0	9	10	15	4
TOTAL A-D2	100	8	7	7	7	7	7	9	9	5	5	6	5	7	5	6	52	48	83	17
A	22	2	2	1	1	2	1	1	1	2	2	1	1	3	1	1	14	8	22	0
B	6	0	0	1	1	2	0	1	0	0	0	0	0	1	0	0	3	3	6	0
C	16	1	2	2	1	0	2	1	1	0	1	1	0	1	1	2	9	7	14	2
D1	30	3	2	1	2	2	1	3	2	2	2	3	2	1	2	2	15	15	22	8
TOTAL A-D1	74	6	6	5	5	6	4	6	4	4	5	5	3	6	4	5	41	33	64	10

In order to explore differences between the A-team and the B-teams of the two groups (N=100 and N=74) in terms of specific demographical information, further descriptive statistical analysis was performed. Results are presented in Table 5.6.

Again not all participants of both groups provided complete demographical information. For the 100 participant group, the A-team statistics on face value presented higher averages regarding age, weight, weight lifted during bench press, time practice per week, years of rugby participation, years of sport participation and grade passed. The A-team was also faster on average time for the 100m sprint. The B-team statistics for this group indicated a higher average on grade percentage mark. The two teams were almost identical in terms of average length.

For the 74 participant group, the A-team statistics also presented higher averages especially with regards to age, weight lifted during bench press, time practice per week, years of rugby participation, years of sport participation and grade passed. The A-team was still faster on

average time for the 100m sprint. The B-team was taller on average and had a higher average for grade percentage mark. The two teams were almost identical in terms of average weight.

TABLE 5.6 Descriptive statistics: Total and final group of participants (N=100 and N=74) per team: Averages

Team	Age (in years)	Weight (in kilo-grams)	Length (in centi-metres)	100m Sprint time (in seconds)	Weight lifted (in kilo-grams)	Time practice per week (in hours)	Rugby years partici-pation (in years)	Sport years partici-pation (in years)	Grade passed	Mark for grade passed (in %)
A-team	17,19	85,58	182,69	12,11	95,07	9,15	11,10	11,33	10,60	67,64
N	**52**	**52**	**52**	**48**	**42**	**51**	**51**	**51**	**47**	**50**
B-team	16,68	83,67	182,70	12,55	89,94	8,25	10,09	10,70	10,18	72,24
N	**47**	**48**	**45**	**41**	**35**	**46**	**47**	**43**	**38**	**46**
TOTAL	**99**	**100**	**97**	**89**	**77**	**97**	**98**	**94**	**85**	**96**
A-team	17,66	86,12	182,80	11,96	97,86	8,77	11,49	11,78	10,83	66,54
N	**41**	**41**	**41**	**38**	**36**	**41**	**41**	**41**	**40**	**41**
B-team	17,12	86,15	183,36	12,45	95,45	7,92	10,33	11,17	10,38	69,36
N	**33**	**33**	**33**	**30**	**29**	**33**	**33**	**30**	**29**	**33**
TOTAL	**74**	**74**	**74**	**68**	**65**	**74**	**74**	**71**	**69**	**74**

The descriptive statistical information provided here guided the researcher to consider only the six demographics which were provided in full by the 74 respondents (ie **age**, **weight**, **length**, **time practice per week**, **participation in rugby** and **mark for grade passed**) to be used as predictors in the study.

Descriptive statistical analysis to explore differences on demographical information between the start-up and reserve players of the two groups was also performed. Results are presented in Table 5.7. For the total group of 100 participants, start-up player statistics showed higher averages for age, weight lifted during bench press, years of rugby participation, years of sport participation, grade passed and grade mark. Start-up players were faster on average time for the 100m sprint.

The reserve player statistics indicated higher averages on weight, length and time practice per week. The reserve players also received a higher average grade mark than the start-up players.

TABLE 5.7   Descriptive statistics: Total and final group of participants (N=100 and N=74) per type of player: Averages

Type of player	Age (in years)	Weight (in kilo-grams)	Length (in centi-metres)	100m Sprint time (in seconds)	Weight lifted (in kilo-grams)	Time practice per week (in hours)	Rugby years partici-pation (in years)	Sport years partici-pation (in years)	Grade passed	Mark for grade passed (in %)
Start-up	17,01	84,47	182,41	12,25	92,83	8,61	10,70	11,09	10,48	69,63
N	83	83	82	75	65	81	81	79	71	79
Reserve	16,63	85,59	184,23	12,66	92,25	9,31	10,18	10,80	10,07	70,82
N	16	17	15	14	12	16	17	15	14	17
TOTAL	99	100	97	89	77	97	98	94	85	96
Start-up	17,45	85,58	182,78	12,14	95,43	8,40	11,05	11,55	10,71	67,97
N	64	64	64	59	56	64	64	62	59	64
Reserve	17,20	89,70	184,80	12,37	105,22	8,35	10,50	11,33	10,20	66,70
N	10	10	10	9	9	10	10	9	10	10
TOTAL	74	74	74	68	65	74	74	71	69	74

For the final study group of 74 participants, statistics indicated higher averages for start-up players on age, time practice per week, years of rugby participation, years of sport participation, grade passed and grade mark. Start-up players were faster on average time for the 100m sprint. The reserve player statistics indicated higher averages on weight, length and weight lifted during bench press. The reserve players also received a higher average mark for grade passed than the start-up players.

Descriptive statistics presented information on the nature and composure of the sample group used in this study. Findings were considered for further analysis as well as interpretation of data. The results from the descriptive data analysis were useful in relation to information received from

other data analysis methods as well as the Coach questionnaire, during the later stages of the study.

5.2.2 Reliability analysis

Exploratory reliability analysis performed on questions B1-B62 in Section B and questions C1-C72 (excluding C10 and C65) in Section C of the questionnaire presented overall Cronbach Alpha values of 0,927 and 0,960 respectively (N=100). Questions B13, B20, B31 and B41 showed inter-item correlations below 0,20 (ie 0,150; 0,075; 0,038 and 0,025 respectively), while questions C21Recoded, C51Recoded and C54Recoded showed negative inter-item correlations (ie -0,233; -0,359 and -0,468 respectively) with other questions used. These questions would be considered for possible exclusion during the formal reliability and factor analyses processes. All other remaining questions had inter-item correlations ranging between 0,20 and 0,75.

Formal test for reliability took place by comparing the items or questions that made up the scales for each of the first nine predictors (ie mental toughness, motivation, focus, personal attributes and attitude, mental imagery, coaching and coach-athlete relationship, team-cohesion, talent and physical attributes and spiritual aspects) and the sub-scales making up the tenth (or emotional intelligence) predictor (N=100). The findings are presented in Table 5.8 for predictors 1 to 9 and in Table 5.9 for predictor 10.

Results from the reliability analysis indicated above 0,50 Cronbach Alpha values for all the predictors except the spiritual aspects predictor. Questions B45 (from the focus scale), B6, B13, B48 (from the spiritual aspects scale) and C56 (from the social responsibility sub-scale) showed inter-item correlations below 0,20 (ie 0,176; 0,073; -0,038; 0,106 and 0,176 respectively). Question B13 also showed a negative inter-item correlation with other questions used in the scale. Questions C21Recoded (from the social responsibility sub-scale), C51Recoded (from the independence sub-scale) and C54Recoded (from the impulse control sub-scale) showed negative inter-item correlations (ie -0,024; -0,380 and -0,387 respectively) with other questions used in the sub-scale.

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TABLE 5.8 Reliability analysis statistics for predictors 1 to 9 scales with Cronbach Alpha coefficient and inter-item correlation (N=100)

Number	Predictor	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
1	**Mental toughness**	100	0,713	6	B17	0,438
					B29	0,411
					B39	0,531
					B43	0,263
					B47	0,586
					B58	0,504
2	**Motivation**	100	0,683	7	B1	0,297
					B9	0,357
					B18	0,370
					B34	0,446
					B44	0,331
					B49	0,515
					B56	0,477
3	**Focus**	100	0,624	8	B2	0,396
					B10	0,373
					B16	0,294
					B32	0,389
					B40	0,313
					B45	0,176
					B54	0,311
					B55	0,409
4	**Personal attributes and attitude**	100	0,735	9	B3	0,455
					B11	0,641
					B15	0,429
					B23	0,393
					B26	0,343
					B28	0,347
					B36	0,255
					B42	0,488
					B59	0,392
5	**Mental imagery**	100	0,599	3	B7	0,367
					B24	0,434
					B50	0,452
6	**Coaching and coach-athlete relationship**	100	0,859	6	B8	0,645
					B12	0,703
					B27	0,670
					B37	0,635
					B52	0,685
					B60	0,561

Number	Predictor	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
7	**Team-cohesion**	100	0,816	7	B4	0,636
					B14	0,468
					B21	0,635
					B33	0,396
					B35	0,465
					B46	0,649
					B53	0,633
8	**Talent and physical attributes**	100	0,774	9	B5	0,483
					B19	0,334
					B22	0,454
					B25	0,467
					B30	0,308
					B38	0,500
					B51	0,585
					B57	0,515
					B61	0,522
9	**Spiritual aspects**	100	0,362	7	B6	0,073
					B13	-0,038
					B20	0,246
					B31	0,217
					B41	0,217
					B48	0,106
					B62	0,226

*List wise deletion of cases took place

TABLE 5.9   Reliability analysis statistics for predictor 10 sub-scales with Cronbach Alpha coefficient and inter-item correlation (N=100)

Number	Emotional intelligence predictor sub-scales	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
1	**Self-regard**	100	0,789	5	C1	0,567
					C15	0,589
					C39	0,607
					C40	0,585
					C52	0,554
2	**Emotional self-awareness**	100	0,760	5	C2	0,488
					C14	0,651
					C37	0,472
					C50	0,634
					C58	0,434

Number	Emotional intelligence predictor sub-scales	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
3	**Assertiveness**	100	0,736	4	C3	0,452
					C16	0,621
					C38	0,462
					C55	0,591
4	**Independence**	100	0,500	6	C4	0,515
					C17	0,356
					C34	0,430
					C51Recoded	-0,380
					C63	0,529
					C71	0,566
5	**Self-actualisation**	100	0,690	4	C5	0,301
					C33	0,524
					C46	0,501
					C62	0,607
6	**Empathy**	100	0,742	4	C6	0,467
					C18	0,599
					C35	0,606
					C49	0,477
7	**Social responsibility**	100	0,378	5	C7	0,252
					C21Recoded	-0,024
					C47	0,317
					C56	0,176
					C72	0,336
8	**Interpersonal relationship**	100	0,730	6	C8	0,532
					C20	0,540
					C31	0,483
					C42	0,291
					C48	0,541
					C59	0,479
9	**Stress tolerance**	100	0,775	6	C9	0,436
					C19	0,476
					C22	0,545
					C36	0,520
					C41	0,671
					C60	0,506
10	**Impulse control**	100	0,382	5	C23	0,303
					C30	0,507
					C32	0,428
					C43	0,378
					C54Recoded	-0,387

Number	Emotional intelligence predictor sub-scales	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
11	**Reality-testing**	100	0,548	4	C11	0,256
					C26	0,331
					C45	0,411
					C66	0,360
12	**Flexibility**	100	0,620	5	C12	0,400
					C29	0,412
					C53	0,437
					C57	0,453
					C67	0,203
13	**Problem-solving**	100	0,707	4	C24	0,411
					C27	0,495
					C64	0,525
					C68	0,549
14	**Optimism**	100	0,583	3	C13	0,460
					C28	0,385
					C70	0,336
15	**Happiness**	100	0,721	4	C25	0,565
					C44	0,557
					C61	0,412
					C69	0,513

*List wise deletion of cases took place

Exploratory reliability analysis was also performed for the sub-scales making up certain predictors such as the motivation, focus, and spiritual aspects predictors to explore Cronbach values and inter-item correlations. Results are presented in Table 5.10.

Below 0,50 Cronbach Alpha values was found for the sub-scales of the spiritual aspects predictors. All inter-item correlations were above 0,25. It was decided that, although the focus scale's sub-scales indicated reliability in terms of the two sub-concepts measured, the focus (techniques) sub-scale would be excluded from the focus predictor. The sub-scale measuring focus (general) (Cronbach Alpha value of 0,67 and inter-item correlations above 0,25) would from hence onward be used as the focus predictor, thereby excluding questions B40 and B45.

TABLE 5.10 Reliability analysis statistics for certain predictors 1 to 9 sub-scales with Cronbach Alpha coefficient and inter-item correlation (N=100)

Number	Predictor	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
1	**Motivation (intrinsic)**	100	0,569	5	B1	0,304
					B9	0,287
					B18	0,408
					B44	0,324
					B49	0,397
2	**Motivation (extrinsic)**	100	0,534	2	B34	0,367
					B56	0,367
3	**Focus (general)**	100	0,667	6	B2	0,367
					B10	0,422
					B16	0,363
					B32	0,396
					B54	0,343
					B55	0,512
4	**Focus (techniques)**	100	0,534	2	B40	0,365
					B45	0,365
5	**Spiritual aspects (religion)**	100	0,436	2	B6	0,284
					B13	0,284
6	**Spiritual aspects (luck, superstition and supernatural)**	100	0,461	3	B20	0,349
					B31	0,257
					B41	0,259
7	**Spiritual aspects (purpose and state)**	100	0,426	2	B48	0,271
					B62	0,271

*List wise deletion of cases took place

The spiritual aspects (religion), spiritual aspects (luck, superstition and supernatural), and spiritual aspects (purpose and state) sub-scales were problematic in as far as Cronbach Alpha values were found to be below 0,50 although inter-item correlations between questions were above 0,25. Closer inspection of the specific questions in these sub-scales indicated possible confusion and misunderstanding due to the way they were phrased. Question B6 was phrased "I have faith in a higher Being or Beings". Question B31 was worded "I have faith in the supernatural, non-material or non-physical". It might be possible that participants found these questions strange and not clearly understanding that they were referring to a higher deity or force in general. Questions B41, which was worded "The mascot makes it happen", could have been non-applicable and irrelevant to the participants or their sport at high school level. Question B20

which was referring to luck as a spiritual aspect was worded "I have a lucky charm". This could also have been non-applicable and irrelevant to the participants or their sport. It might have been more appropriate to phrase the question as "I am lucky" to measure luck as an aspect of sport performance.

It was decided to exclude these questions from the study and only remain with question B13 ("I am serious about my religious beliefs") to be used as the new spiritual aspects (religious) predictor, question B48 ("I find purpose and meaning in life through my sport performance") to be used as a separate new spiritual aspects (purpose and meaning) predictor, and question B62 ("I go beyond myself to a higher state or place of being while on the field") to be used as a third separate new spiritual aspects (higher state) predictor.

Reliability analysis was re-performed on the independence, social responsibility and impulse control sub-scales without questions C51Recoded, C21Recoded and C54Recoded which showed negative inter-item correlations with other questions within the sub-scale. Closer inspection of these questions and other questions used in the sub-scales revealed that the emotional intelligence predictor sub-concepts could still be maintained through the remaining questions forming the new sub-scales. Although question C56 showed below 0,25 inter-item correlations with other questions previously, within the new sub-scale it was above 0,25. Results are presented in Table 5.11.

Reliability analysis results indicated Cronbach Alpha values of above 0,50 for the new independence, social responsibility and impulse control sub-scales with all inter-item correlations between questions above 0,25. It was decided to use the new-sub scales with those previously accepted as reliable (ie Cronbach Alpha values of above 0,50 and inter-item correlations above 0,25) to form the emotional intelligence predictor.

TABLE 5.11 Reliability analysis statistics for predictor 10 new sub-scales with Cronbach Alpha coefficient and inter-item correlation (N=100)

Number	Emotional intelligence predictor sub-scales	N of cases	Cronbach Alpha	N of items	Question	Item-total correlation
1	Independence (new)	100	0,788	5	C4	0,605
					C17	0,459
					C34	0,500
					C63	0,634
					C71	0,648
2	Social responsibility (new)	100	0,524	4	C7	0,264
					C47	0,326
					C56	0,308
					C72	0,377
3	Impulse control (new)	100	0,717	4	C23	0,400
					C30	0,615
					C32	0,507
					C43	0,516

*List wise deletion of cases took place

The predictors of the study to be used for further analysis would therefore consist of scales, sub-scales, and individual questions. Scales and sub-scales would henceforth consist of either the original combination of questions or a re-combination of questions in as far as certain questions were excluded as determined through reliability analysis. The questions excluded were questions B6, B20, B31, B40, B41, B45, C21Recoded, C51Recoded and C54Recoded. The spiritual aspect predictor did not consist of a scale made up by questions anymore, but were divided into three separate predictors (made up by individual questions) called spiritual aspects (religious), spiritual aspects (purpose and meaning), and spiritual aspects (higher state).

The remaining questions in Section B and Section C of the questionnaire used for further analysis consisted of 56 and 67 questions in total. Predictors of the study were chosen following the reliability results based on the criteria that all scale and sub-scale Cronbach Alpha values were above 0,50 and inter-item correlations above 0,25. In total, 11 predictors thereafter existed for physical, psychological, social and spiritual aspects related to sport performance and 15 predictors for emotional aspects related to sport performance. A summary of the predictors further used in the study is given in Table 5.12.

TABLE 5.12 Summary of predictors: Physical, psychological, social, spiritual and emotional aspects related to sport performance (N=100)

Number	Predictor scales and sub-scales	N of predictors	Cronbach Alpha	N of items	Questions
Physical, psychological, social and spiritual aspects related to sport performance					
1	Mental toughness	1	0,713	6	B17, B29, B39, B43, B47, B58
2	Motivation	1	0,683	7	B1, B9, B18, B34, B44, B49, B56
3	Focus (new)	1	0,667	6	B2, B10, B16, B32, B54, B55
4	Personal attributes and attitude	1	0,735	9	B3, B11, B15, B23, B26, B28, B36, B42, B59
5	Mental imagery	1	0,599	3	B7, B24, B50
6	Coaching and coach-athlete relationship	1	0,859	6	B8, B12, B27, B37, B52, B60
7	Team-cohesion	1	0,816	7	B4, B14, B21, B33, B35, B46, B53
8	Talent and physical attributes	1	0,774	9	B5, B19, B22, B25, B30, B38, B51, B57, B61
9	Spiritual aspect (religious)	1		1	B13
10	Spiritual aspect (purpose and meaning)	1		1	B48
11	Spiritual aspect (higher state)	1		1	B62
TOTAL		**11**		**56**	
Emotional aspects related to sport performance					
1	Self-regard	1	0,789	5	C1, C15, C39, C40, C52
2	Emotional self-awareness	1	0,760	5	C2, C14, C37, C50, C58
3	Assertiveness	1	0,736	4	C3, C16, C38, C55
4	Independence (new)	1	0,788	5	C4, C17, C34, C63, C71
5	Self-actualisation	1	0,690	4	C5, C33, C46, C62
6	Empathy	1	0,742	4	C6, C18, C35, C49
7	Social responsibility (new)	1	0,524	4	C7, C47, C56, C72
8	Interpersonal relationship	1	0,730	6	C8, C20, C31, C42, C48, C59
9	Stress tolerance	1	0,775	6	C9, C19, C22, C36, C41, C60
10	Impulse control (new)	1	0,717	4	C23, C30, C32, C43
11	Reality-testing	1	0,548	4	C11, C26, C45, C66
12	Flexibility	1	0,620	5	C12, C29, C53, C57, C67

Number	Predictor scales and sub-scales	N of predictors	Cronbach Alpha	N of items	Questions
13	**Problem-solving**	1	0,707	4	C24, C27, C64, C68
14	**Optimism**	1	0,714	3	C13, C28, C70
15	**Happiness**	1	0,721	4	C25, C44, C61, C69
TOTAL		**15**		**67**	

*List wise deletion of cases took place

5.2.3 Factor analysis

Exploratory factor analysis of the **finalised predictors** in Section B and Section C in the questionnaire was conducted to explore how these predictors grouped together according to the larger group data (N=100). The results from SPSS through the Principal Component Analysis Extraction and Varimax Rotation Method presented the researcher with five components (or factors) with eigen values of above 1. Scree plot results indicated possible retention of five components. Pair wise exclusion of cases took place. The rotation converged. Parallel analysis through Monte Carlo PCA for Parallel Analysis indicated 12 components with eigen values above 1. When compared with the SPSS values, two components of the SPSS output had a higher eigen value, and thereby retention of two components was suggested.

The SPSS Component Matrix indicated most items loading strongly (r>0,30) on the first component. This component explained 49,99% of the total variance before rotation and thereafter 32,81%. Component 2 explained 7,67% of the total variance before rotation and after rotation 17,16%. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0,915 and the Bartlett's Test of Sphericity significant (p=0,000). Results indicated that the larger group viewed the 26 predictors as two factors. (It was interesting to see how these predictors grouped together.) Results are presented in Table 5.13.

TABLE 5.13 Component factor loading (p>0,30) for total finalised predictors of the study (N=100)

Number	Predictor	Component	
		1	2
1	Independence	0,845	
2	Stress tolerance	0,816	
3	Emotional self-awareness	0,813	0,351
4	Empathy	0,811	
5	Impulse control	0,808	
6	Interpersonal relationship	0,778	0,339
7	Happiness	0,763	
8	Problem-solving	0,755	
9	Reality-testing	0,749	0,307
10	Flexibility	0,748	0,379
11	Assertiveness	0,746	0,400
12	Optimism	0,641	
13	Self-actualisation	0,635	0,403
14	Mental toughness	0,613	0,400
15	Self-regard	0,578	0,536
16	Team-cohesion	0,505	0,433
17	Spiritual aspects (religious)		
18	Mental imagery		0,800
19	Spiritual aspects (purpose and meaning)		0,669
20	Personal attributes and attitude	0,475	0,667
21	Motivation		0,654
22	Coaching and coach-athlete relationship		0,653
23	Social responsibility	0,453	0,576
24	Talent and physical attributes	0,487	0,575
25	Focus	0,477	0,524
26	Spiritual aspects (higher state)		0,469

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

Almost all of the emotional intelligence sub-scale predictors in Section C grouped together as component 1 with the exception of social responsibility, which loaded stronger on component 2. Component 2 contained mostly the predictors in Section B in the questionnaire with the exception of mental toughness and team-cohesion. The spiritual aspects (religious) predictor was the only predictor that did not load sufficiently (r<0,30) on either of the two components. Because the

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questionnaire was originally compiled with the intention of separating the emotional intelligence predictor (with its sub-scales) from the other predictors through Section C[8] (and the results here supported separation through the 2 components), it was decided to perform factor analysis separately on the two sections in the questionnaire.

5.2.3.1 Section B in the questionnaire

Factor analysis was performed on the finalised predictors measuring physical, psychological, social and spiritual aspects related to sport performance in Section B of the questionnaire (N=74). The Principal Component Analysis Extraction and Varimax Rotation Method presented extraction of two components with eigen values of above 1. The rotation converged. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was found to be above 0,80 (KMO=0,836) and the Bartlett's Test of Sphericity significant (p=0,000).

The Scree plot results supported the extraction of two components. Parallel analysis could not be performed due to the small sample group. The SPSS output suggestions were accepted for the retention of components. For the total variance explained according to SPSS it was found that components 1 and 2 each, before rotation, explained 41,89% and 12,74%. After rotation, they explained 30,84% and 23,78% respectively.

The two components as suggested by SPSS for the predictors measuring physical, psychological, social and spiritual aspects related to sport performance are presented in Table 5.14. Component 1 consisted of mental toughness, talent and physical attributes, personal attributes and attitude, motivation, focus, team-cohesion and spiritual aspects (religious). Mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state) and coaching and coach-athlete relationship grouped together as component 2. These two new component groupings would later be used as two predictors during the Logistic Regression analysis.

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[8] One of the major differences between the questions in Section B and C in the questionnaire was that questions in Section C were phrased in terms of feelings and emotions

TABLE 5.14 Component factor loading (p>0,30) for the scales of the predictors measuring physical, psychological, social and spiritual aspects related to sport performance (N=74)

	Rotated component matrix		
Predictor number	**Predictor scale name**	**Component**	
		1	**2**
1	Mental toughness	0,800	
8	Talent and physical attributes	0,741	0,341
4	Personal attributes and attitude	0,689	0,483
2	Motivation	0,672	
3	Focus (new)	0,647	
7	Team-cohesion	0,603	0,347
9a	Spiritual aspects (religious)	0,545	
5	Mental imagery		0,760
9b	Spiritual aspects (purpose and meaning)		0,734
9c	Spiritual aspects (higher state)		0,665
6	Coaching and coach-athlete relationship	0,342	0,604

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

5.2.3.2 Section C in the questionnaire

Factor analysis was performed on the finalised predictor sub-scales measuring emotional aspects related to sport performance contained in Section C in the questionnaire (N=74). The Principal Component Analysis Extraction and Varimax Rotation Method presented extraction of two components with eigen values of above 1. The rotation converged. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was found to be above 0,90 (KMO=0,931) and the Bartlett's Test of Sphericity significant (p=0,000).

The Scree plot suggested extraction of only one component. Parallel analysis again could not be performed due to the small sample group. The SPSS output suggestions were considered for the retention of components. It was decided to reject the Scree plot suggestion and retain two

components according to the total variance explained output. Component 1, before rotation, explained 62,80% of the variance and after rotation, it explained 39,23%. Component 2, before rotation, explained 6,78% and after rotation, 30,34%.

The two components as suggested by SPSS for the (new) sub-scales of the predictor measuring emotional aspects related to sport performance are presented in Table 5.15. Component 1 consisted of assertiveness, self-actualisation, empathy, social responsibility, independence, emotional self-awareness, reality-testing, impulse control, interpersonal relationship and problem-solving. Happiness, optimism, self-regard, flexibility and stress tolerance grouped together as component 2. These two new component groupings would also later be used as two predictors during the Logistic Regression analysis.

TABLE 5.15 Component factor loading (p>0,30) for the sub-scales of the predictor measuring emotional aspects related to sport performance (N=74)

Rotated component matrix			
Sub-scale number	Emotional intelligence predictor sub-scale name	Component	
		1	2
3	Assertiveness	0,817	0,325
5	Self-actualisation	0,793	
6	Empathy	0,765	0,425
7	Social responsibility (new)	0,754	
4	Independence (new)	0,724	0,475
2	Emotional self-awareness	0,712	0,477
11	Reality-testing	0,712	0,397
10	Impulse control (new)	0,644	0,486
8	Interpersonal relationship	0,624	0,532
13	Problem-solving	0,617	0,524
15	Happiness		0,860
14	Optimism		0,781
1	Self-regard	0,312	0,711
12	Flexibility	0,516	0,699
9	Stress tolerance	0,475	0,657

*Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

In summary, it was decided from the factor analysis findings that for the predictors measuring physical, psychological, social and spiritual aspects related to sport performance, two components would be retained and considered for further analysis. For the predictor measuring emotional aspects related to sport performance, two components would be retained and considered for further analysis.

5.2.4   Mann-Whitney Test

The Mann-Whitney test in SPSS was used to compare the A-team and the B-team (N=74) on each of the **questions** in the questionnaire excluding certain demographic questions (A11, A12, and A15 to A22) and questions in Section C (C10, C21Recoded, C51Recoded, C54Recoded and C65) which were ignored for analysis purposes. When compared in terms of the demographic questions, the two teams outperformed each other on different aspects. Results for the A-team outperforming the B-team are presented in Table 5.16.

TABLE 5.16 A-team outperforming B-team significantly on demographic questions (N=74)

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
1	Current age in years	A-team	41	44,02	1805,00	409,000	970,000	-3,195	0,001
		B-team	33	29,39	970,00				
		Total	**74**						
9	Participation in rugby in years (total years including current year)	A-team	41	44,50	1824,50	389,500	950,500	-3,222	0,001
		B-team	33	28,80	950,50				
		Total	**74**						
13	Highest school education level achieved (or grade passed)	A-team	40	41,19	1647,50	332,500	767,500	-3,660	0,000
		B-team	29	26,47	767,50				
		Total	**69**						

Results from the Mann-Whitney Test indicated that the A-team players were significantly older than the B-team players (p=0,001), the years they participated in rugby significantly more (p=0,001) and their education level passed at school significantly higher (p=0,000). Not all

participants however, completed the question related to highest school education level achieved, which was therefore ignored for further analysis.

Results for the B-team outperforming the A-team are presented in Table 5.17. The Mann-Whitney Test results indicated that the B-team players' heart rate before the 100m sprint were significantly faster (more beats) than the A-team players (p=0,035) and their time for the 100m sprint significantly higher (p=0,012). Again, not all participants completed these two questions, which also were ignored for further analysis. On all the other demographic questions there were no significant differences between the two teams (p≥0,05).

TABLE 5.17 B-team outperforming A-team significantly on demographic questions (N=74)

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
4	Heart rate (pulse) before 100m sprint in beats per minute	B-team	9	17,83	160,50	37,500	190,500	-2,110	0,035
		A-team	17	11,21	190,50				
		Total	**26**						
6	Time for 100m sprint in seconds	B-team	30	41,27	1238,00	367,000	1108,000	-2,516	0,012
		A-team	38	29,16	1108,00				
		Total	**68**						

The two teams outperformed each other significantly with regards to the questions in Section B and Section C in the questionnaire. Results for the A-team outperforming the B-team significantly on Section B questions are provided in Table 5.18.

The Mann-Whitney Test results showed the A-team players scored significantly higher than the B-team players on two questions in Section B of the questionnaire. These included the questions concerning the relationship between the player and the coach as being healthy and effective (p=0,041) and going beyond oneself to a higher state or place of being while on the field (p=0,041).

TABLE 5.18 A-team outperforming B-team significantly on Section B questions (N=74)

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
B8	The relationship between me and the coach is healthy and effective	A-team	41	41,82	1714,50	499,500	1060,500	-2,041	0,041
		B-team	33	32,14	1060,50				
B62	I go beyond myself to a higher state or place of being while on the field	A-team	41	41,90	1718,00	496,000	1057,000	-2,048	0,041
		B-team	33	32,03	1057,00				

The Mann-Whitney Test results further showed the B-team players in turn scoring significantly higher than the A-team players with regards to certain questions in Section B of the questionnaire. These included questions concerning: a) the ability to execute two tasks or actions at the same time and equally well ($p=0,014$); b) having the ability to succeed as shown in family history for instance older family member success ($p=0,038$); c) completing a task to achieve their own set standard of performance ($p=0,009$); d) having a strong team spirit ($p=0,016$); e) getting to a state where the player is 'flowing' freely meaning things just happen spontaneously ($p=0,026$); f) having 'natural' ability with regards to certain skills such as 'ball sense' ($p=0,018$); and g) bouncing back from failure ($p=0,046$).

Results for the B-team outperforming the A-team significantly on Section B questions are provided in Table 5.19.

TABLE 5.19 B-team outperforming A-team significantly on Section B questions (N=74)

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
B16	I have the ability to execute two tasks or actions at the same time and equally well	B-team	33	43,61	1439,00	475,000	1336,000	-2,452	0,014
		A-team	41	32,59	1336,00				

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Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
B19	I have the ability to succeed as shown in my family history (eg older family member success)	B-team	33	43,00	1419,00	495,000	1356,000	-2,074	0,038
		A-team	41	33,07	1356,00				
B49	I complete the task to achieve my own set standard of performance	B-team	33	44,38	1464,50	449,500	1310,500	-2,623	0,009
		A-team	41	31,96	1310,50				
B53	We have a strong team spirit	B-team	33	43,77	1444,50	469,500	1330,500	-2,402	0,016
		A-team	41	32,45	1330,50				
B54	I get to a state where I am 'flowing' freely (things just happen spontaneously)	B-team	33	43,35	1430,50	483,500	1344,500	-2,222	0,026
		A-team	41	32,79	1344,50				
B57	I have the 'natural' ability with regards to certain skills such as 'ball sense'	B-team	33	43,62	1439,50	474,500	1335,500	-2,369	0,018
		A-team	41	32,57	1335,50				
B58	I can bounce back from failure	B-team	33	42,30	1396,00	518,000	1379,000	-1,997	0,046
		A-team	41	33,63	1379,00				

The B-team outperformed the A-team significantly with regards to the questions in Section C in the questionnaire. Results for Section C questions are presented in Table 5.20. There were no questions in Section C on which the A-team scored significantly higher than the B-team.

TABLE 5.20 B-team outperforming A-team significantly on Section C questions (N=74)

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
C1	In general I have strong feelings of self-worth, self-esteem and self-respect	B-team	33	42,92	1416,50	497,500	1358,500	-2,121	0,034
		A-team	41	33,13	1358,50				

Question	Description	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
C2	I am aware of my own feelings when I perform in my sport	B-team	33	43,41	1432,50	481,500	1342,500	-2,335	0,020
		A-team	41	32,74	1342,50				
C4	I can freely experience my own emotions during a game	B-team	33	43,97	1451,00	463,000	1324,000	-2,482	0,013
		A-team	41	32,29	1324,00				
C12	It is easy for me to adapt to changes experienced in the game	B-team	33	42,77	1411,50	502,500	1363,500	-2,115	0,034
		A-team	41	33,26	1363,50				
C15	I value myself very highly	B-team	33	44,98	1484,50	429,500	1290,500	-2,774	0,006
		A-team	41	31,48	1290,50				
C18	I can easily recognize feelings in other players	B-team	33	43,08	1421,50	492,500	1353,500	-2,069	0,039
		A-team	41	33,01	1353,50				
C20	I can easily pick up what others are feeling via their body language	B-team	33	43,67	1441,00	473,000	1334,000	-2,308	0,021
		A-team	41	32,54	1334,00				
C25	I have happy feelings such as contentment, enthusiasm, satisfaction and joy	B-team	33	44,62	1472,50	441,500	1302,500	-2,759	0,006
		A-team	41	31,77	1302,50				
C35	I understand the emotions experienced by other players during a game	B-team	33	44,21	1459,00	455,000	1316,000	-2,504	0,012
		A-team	41	32,10	1316,00				
C44	I have intense feelings of well-being and happiness	B-team	33	42,79	1412,00	502,000	1363,000	-2,016	0,044
		A-team	41	33,24	1363,00				
C45	I have realistic feelings about myself	B-team	33	42,58	1405,00	509,000	1370,000	-2,009	0,045
		A-team	41	33,41	1370,00				
C48	I generally have feelings of trust for other members of the team	B-team	33	44,15	1457,00	457,000	1318,000	-2,639	0,008
		A-team	41	32,15	1318,00				
C61	I am in a happy mood most of the time during a game	B-team	33	43,98	1451,50	462,500	1323,500	-2,444	0,015
		A-team	41	32,28	1323,50				

The Mann-Whitney Test results showed the B-team players scored significantly higher than the A-team players with regards to questions concerning: a) general strong feelings of self-worth, self-esteem and self-respect (p=0,034); b) being aware of own feelings when performing in the sport (p=0,020); c) freely experiencing own emotions during a game (p=0,013); d) easily

adapting to changes experienced in the game (p=0,034); e) valuing oneself very highly (p=0,006); f) easily recognising feelings in other players (p=0,039); g) easily picking up what others are feeling via their body language (p=0,021); h) having happy feelings such as contentment, enthusiasm, satisfaction and joy (p=0,006); i) understanding the emotions experienced by other players during a game (p=0,012); j) having intense feelings of well-being and happiness (p=0,044); k) having realistic feelings about oneself (p=0,045); l) generally having feelings of trust for other members of the team (p=0,008); and m) being in a happy mood most of the time during a game (p=0,015).

The total group of 74 participants completed the questions that were used for comparing the A-team and the B-team. On all the other questions not mentioned here there were no significant differences between the two teams (p≥0,05).

The Mann-Whitney test was used to compare the A-team and the B-team (N=74) on each of the **predictors and their sub-scales**. Results for the A-team outperforming the B-team significantly are indicated in Table 5.21.

TABLE 5.21 A-team outperforming B-team significantly on predictors or predictor sub-scales (N=74)

Predictor or Predictor sub-scale	Predictor or Predictor sub-scale questions	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
Spiritual attributes (higher state)	B62	A-team	41	41,90	1718,00	496,000	1057,000	-2,048	0,041
		B-team	33	32,03	1057,00				

Results for the B-team outperforming the A-team significantly are indicated in Table 5.22. The results from the Mann-Whitney Test indicated that the A-team scored significantly higher with regards to spiritual aspects (higher state), measured by question B62 ("I go beyond myself to a higher state or place of being while on the field"), than the B-team (p=0,041).

TABLE 5.22 B-team outperforming A-team significantly on predictors or predictor sub-scales (N=74)

Predictor or Predictor sub-scale	Predictor or Predictor sub-scale questions	Team standing	N	Mean rank	Sum of ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
Motivation (intrinsic)	B1, B9, B18, B44, B49	B-team	33	43,08	1421,50	492,500	1353,500	-2,018	0,044
		A-team	41	33,01	1353,50				
Talent & Physical attributes (genes)	B19, B51	B-team	33	44,53	1469,50	444,500	1305,500	-2,588	0,010
		A-team	41	31,84	1305,50				
Self-regard	C1, C15, C39, C40, C52	B-team	33	43,74	1443,50	470,500	1331,500	-2,252	0,024
		A-team	41	32,48	1331,50				
Empathy	C6, C18, C35, C49	B-team	33	43,33	1430,00	484,000	1345,000	-2,105	0,035
		A-team	41	32,80	1345,00				
Reality-testing	C11, C26, C45, C66	B-team	33	45,20	1491,50	422,500	1283,500	-2,792	0,005
		A-team	41	31,30	1283,50				
Happiness	C25, C44, C61, C69	B-team	33	45,39	1498,00	416,000	1277,000	-2,871	0,004
		A-team	41	31,15	1277,00				

The B-team scored significantly higher on the predictor sub-scales motivation (intrinsic) (p=0,044), talent and physical attributes (genes) (p=0,010), self-regard (p=0,024), empathy (p=0,035), reality-testing (p=0,005) and happiness (p=0,004) than the A-team. On all the other sub-scales there were no significant differences between the A-team and the B-team (p≥0,05). The findings here would later on be compared with the results of the Logistic Regression analysis for the use of interpreting findings.

The Mann-Whitney Test was chosen as the analysis method to test the hypothesis suggesting that emotional intelligence is a predictor of rugby performance, and results are presented in Table 5.23. It was found that in terms of the emotional intelligence predictor (including total emotional intelligence score and emotional intelligence domains) as well as the sub-scales no significant differences existed between the A-team and B-team (p≥0,05).

TABLE 5.23 A-team's and B-team's compared performance with regards to emotional intelligence (N=74)

Emotional intelligence predictor and Sub-scales	Team standing	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Asymp. sig. (2-tailed)
Total Emotional intelligence	B-team	33	42,20	1392,50	521,500	1382,500	-1,686	0,092
	A-team	41	33,72	1382,50				
Intra-personal	B-team	33	41,61	1373,00	541,000	1402,000	-1,474	0,141
	A-team	41	34,20	1402,00				
Inter-personal	B-team	33	41,21	1360,00	554,000	1415,000	-1,333	0,183
	A-team	41	34,51	1415,00				
Stress management	B-team	33	41,20	1359,50	554,500	1415,500	-1,328	0,184
	A-team	41	34,52	1415,50				
Adaptability	B-team	33	42,91	1416,00	498,000	1359,000	-1,942	0,052
	A-team	41	33,15	1359,00				
General mood	B-team	33	42,30	1396,00	518,000	1379,000	-1,725	0,084
	A-team	41	33,63	1379,00				

5.2.5 Spearman's Rank Order Correlation

The Spearman's Rank Order Correlation was performed on certain **particular variables** to determine possible relationships between them. The study group of 74 participants was used for this purpose (see Table 5.24 and Table 5.25 for correlation results).

The variables used included the predictors and predictor sub-scales of the study as well as certain questions found to be significant from the Mann-Whitney Test results. Almost all the predictors measuring physical, psychological, social and spiritual aspects related to sport performance correlated well (p<0,01) with each other according to Spearman Rank Order Correlation with the exception of mental imagery, coaching and coach-athlete relationship, spiritual aspects (religious), spiritual aspects (purpose and meaning), and spiritual aspects (higher state). Most correlations were significant at the 0,01 level (2-tailed) with some at the 0,05 level (2-tailed).

Table 5.24 Spearman's rho Correlation for predictors measuring physical, psychological, social and spiritual aspects related to sport performance (N=74)

Predictor	Correlation Coefficient and Sig. (2-tailed)	MT	MOT	FOC	PA	MI	CA	TC	TPA	SArel	SApm	SAhs
MT	Corr. Coeff.	1,000	0,358**	0,399**	0,561**	0,220	0,209	0,528**	0,512**	0,326**	0,203	0,185
	Sig.	.	0,002	0,000	0,000	0,059	0,074	0,000	0,000	0,005	0,082	0,115
MOT	Corr. Coeff.	0,358**	1,000	0,320**	0,562**	0,411**	0,555**	0,380**	0,647**	0,312**	0,163	0,253*
	Sig.	0,002	.	0,005	0,000	0,000	0,000	0,001	0,000	0,007	0,166	0,030
FOC	Corr. Coeff.	0,399**	0,320**	1,000	0,444**	0,295*	0,266*	0,433**	0,460**	0,077	0,263*	0,085
	Sig.	0,000	0,005	.	0,000	0,011	0,022	0,000	0,000	0,516	0,024	0,473
PA	Corr. Coeff.	0,561**	0,562**	0,444**	1,000	0,419**	0,480**	0,623**	0,667**	0,194	0,462**	0,472**
	Sig.	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,099	0,000	0,000
MI	Corr. Coeff.	0,220	0,411**	0,295*	0,419**	1,000	0,555**	0,384**	0,474**	0,103	0,532**	0,391**
	Sig.	0,059	0,000	0,011	0,000	.	0,000	0,001	0,000	0,381	0,000	0,001
CA	Corr. Coeff.	0,209	0,555**	0,266*	0,480**	0,555**	1,000	0,418**	0,534**	0,137	0,424**	0,316**
	Sig.	0,074	0,000	0,022	0,000	0,000	.	0,000	0,000	0,244	0,000	0,006
TC	Corr. Coeff.	0,528**	0,380**	0,433**	0,623**	0,384**	0,418**	1,000	0,514**	0,220	0,446**	0,212
	Sig.	0,000	0,001	0,000	0,000	0,001	0,000	.	0,000	0,059	0,000	0,070
TPA	Corr. Coeff.	0,512**	0,647**	0,460**	0,667**	0,474**	0,534**	0,514**	1,000	0,150	0,363**	0,273*
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,202	0,001	0,019
SArel	Corr. Coeff.	0,326**	0,312**	0,077	0,194	0,103	0,137	0,220	0,150	1,000	0,073	-0,017
	Sig.	0,005	0,007	0,516	0,099	0,381	0,244	0,059	0,202	.	0,534	0,886
SApm	Corr. Coeff.	0,203	0,163	0,263*	0,462**	0,532**	0,424**	0,446**	0,363**	0,073	1,000	0,328**
	Sig.	0,082	0,166	0,024	0,000	0,000	0,000	0,000	0,001	0,534	.	0,004
SAhs	Corr. Coeff.	0,185	0,253*	0,085	0,472**	0,391**	0,316**	0,212	0,273*	-0,017	0,328**	1,000
	Sig.	0,115	0,030	0,473	0,000	0,001	0,006	0,070	0,019	0,886	0,004	.

** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).

Note. MT=Mental toughness; MOT=Motivation; FOC=Focus; PA=Personal attributes and Attitude; MI=Mental imagery; CA=Coaching and Coach-athlete relationship; TC=Team-cohesion; TPA=Talent and Physical attributes; SArel=Spiritual aspects (religious); SApm=Spiritual aspects (purpose and meaning); SAhs=Spiritual aspects (higher state).

The strongest correlations were found between personal attributes and attitude and talent and physical attributes (r=0,667 at the 0,01 Sig. 2-tailed level), motivation and talent and physical attributes (r=0,647 at the 0,01 Sig. 2-tailed level), as well as personal attributes and attitude and team-cohesion (r=0,623 at the 0,01 Sig. 2-tailed level). Personal attributes and attitude also correlated strongly with motivation (r=0,562 at the 0,01 Sig. 2-tailed level). Other strong correlations existed between coaching and coach-athlete relationship and motivation (r=0,555 at the 0,01 Sig. 2-tailed level), and coaching and coach-athlete relationship and mental imagery (r=0,555 at the 0,01 Sig. 2-tailed level).

Mental toughness correlated strongly with personal attributes and attitude (r=0,561 at the 0,01 Sig. 2-tailed level), team-cohesion (r=0,528 at the 0,01 Sig. 2-tailed level) and talent and physical attributes (r=0,512 at the 0,01 Sig. 2-tailed level). Coaching and coach-athlete relationship further correlated with talent and physical attributes (r=0,534 at the 0,01 Sig. 2-tailed level), while mental imagery correlated with spiritual aspects (purpose and meaning) (r=0,532 at the 0,01 Sig. 2-tailed level). It was also found that team-cohesion and talent and physical attributes correlated with each other (r=0,512 at the 0,01 Sig. 2-tailed level).

All the predictor sub-scales measuring emotional aspects related to sport performance, correlated significantly well (p<0,01) with each other according to Spearman Rank Order Correlation at the 0,01 Sig. 2-tailed level. The strongest correlations existed between emotional self-awareness and independence (r=0,728), independence and empathy (r=0,726), emotional self-awareness and empathy (r=0,706), and happiness and self-regard (r=0,700).

Very strong correlations also existed for assertiveness and self-actualisation (r=0,695), empathy and interpersonal relationship (r=0,692), and emotional self-awareness and interpersonal relationship (r=0,687), emotional self-awareness and assertiveness (r=0,686), empathy and reality-testing (r=0,673), independence and interpersonal relationship (r=0,673), empathy and social responsibility (r=0,664), and assertiveness and social responsibility (r=0,663). Various other strong correlations were found between the remaining predictor sub-scales.

Table 5.25 Spearman's rho Correlation for the predictor measuring emotional aspects related to sport performance (N=74)

Emotional intelligence predictor sub-scales	Correlation Coefficient and Sig. (2-tailed)	SR	ESA	ASS	IND	SA	EMP	SOR	IR	ST	IC	RT	FLE	PS	OP	HAP
SR	Corr. Coeff.	1,000	0,584 **	0,476 **	0,481 **	0,387 **	0,564 **	0,429 **	0,473 **	0,508 **	0,445 **	0,546 **	0,497 **	0,439 **	0,380 **	0,700 **
	Sig.	.	0,000	0,000	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000
ESA	Corr. Coeff.	0,584 **	1,000	0,686 **	0,728 **	0,524 **	0,706 **	0,622 **	0,687 **	0,521 **	0,641 **	0,633 **	0,540 **	0,604 **	0,522 **	0,546 **
	Sig.	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
ASS	Corr. Coeff.	0,476 **	0,686 **	1,000	0,643 **	0,695 **	0,632 **	0,663 **	0,581 **	0,513 **	0,616 **	0,627 **	0,647 **	0,530 **	0,363 **	0,444 **
	Sig.	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001	0,000
IND	Corr. Coeff.	0,481 **	0,728 **	0,643 **	1,000	0,550 **	0,726 **	0,536 **	0,673 **	0,607 **	0,562 **	0,542 **	0,541 **	0,608 **	0,547 **	0,474 **
	Sig.	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
SA	Corr. Coeff.	0,387 **	0,524 **	0,695 **	0,550 **	1,000	0,594 **	0,499 **	0,405 **	0,497 **	0,568 **	0,640 **	0,504 **	0,557 **	0,315 **	0,345 **
	Sig.	0,001	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,006	0,003
EMP	Corr. Coeff.	0,564 **	0,706 **	0,632 **	0,726 **	0,594 **	1,000	0,664 **	0,692 **	0,535 **	0,629 **	0,673 **	0,591 **	0,642 **	0,451 **	0,486 **
	Sig.	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
SOR	Corr. Coeff.	0,429 **	0,622 **	0,663 **	0,536 **	0,499 **	0,664 **	1,000	0,653 **	0,404 **	0,491 **	0,553 **	0,625 **	0,559 **	0,405 **	0,385 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,001
IR	Corr. Coeff.	0,473 **	0,687 **	0,581 **	0,673 **	0,405 **	0,692 **	0,653 **	1,000	0,504 **	0,566 **	0,568 **	0,636 **	0,600 **	0,555 **	0,485 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000	0,000
ST	Corr. Coeff.	0,508 **	0,521 **	0,513 **	0,607 **	0,497 **	0,535 **	0,404 **	0,504 **	1,000	0,562 **	0,548 **	0,605 **	0,559 **	0,454 **	0,560 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000	0,000
IC	Corr. Coeff.	0,445 **	0,641 **	0,616 **	0,562 **	0,568 **	0,629 **	0,491 **	0,566 **	0,562 **	1,000	0,619 **	0,541 **	0,519 **	0,399 **	0,528 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000	0,000	0,000

Emotional intelligence predictor sub-scales	Correlation Coefficient and Sig. (2-tailed)	SR	ESA	ASS	IND	SA	EMP	SOR	IR	ST	IC	RT	FLE	PS	OP	HAP
RT	Corr. Coeff.	0,546 **	0,633 **	0,627 **	0,542 **	0,640 **	0,673 **	0,553 **	0,568 **	0,548 **	0,619 **	1,000	0,592 **	0,580 **	0,359 **	0,559 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,002	0,000
FLE	Corr. Coeff.	0,497 **	0,540 **	0,647 **	0,541 **	0,504 **	0,591 **	0,625 **	0,636 **	0,605 **	0,541 **	0,592 **	1,000	0,573 **	0,546 **	0,554 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000	0,000
PS	Corr. Coeff.	0,439 **	0,604 **	0,530 **	0,608 **	0,557 **	0,642 **	0,559 **	0,600 **	0,559 **	0,519 **	0,580 **	0,573 **	1,000	0,575 **	0,565 **
	Sig.	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.	0,000	0,000
OP	Corr. Coeff.	0,380 **	0,522 **	0,363 **	0,547 **	0,315 **	0,451 **	0,405 **	0,555 **	0,454 **	0,399 **	0,359 **	0,546 **	0,575 **	1,000	0,448 **
	Sig.	0,001	0,000	0,001	0,000	0,006	0,000	0,000	0,000	0,000	0,000	0,002	0,000	0,000	.	0,000
HAP	Corr. Coeff.	0,700 **	0,546 **	0,444 **	0,474 **	0,345 **	0,486 **	0,385 **	0,485 **	0,560 **	0,528 **	0,559 **	0,554 **	0,565 **	0,448 **	1,000
	Sig.	0,000	0,000	0,000	0,000	0,003	0,000	0,001	0,000	0,000	0,000	0,000	0,000	0,000	0,000	.

** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).

Note. SR=Self-regard; ESA=Emotional self-awareness; ASS=Assertiveness; IND=Independence; SA=Self-actualisation; EMP=Empathy; SOR=Social responsibility; IR=Interpersonal relationship; ST=Stress tolerance; IC=Impulse control; RT=Reality-testing; FLE=Flexibility; PS=Problem-solving; OP=Optimism; HAP=Happiness.

The study's A-team (N=41) and B-team (N=33) were compared on the strength of the correlation coefficients applicable to the questions where the two groups significantly differed from each other as a result of the Mann-Whitney Test performed. Results of the Spearman Rank Order Correlation pertaining to the two groups and regarding these questions are presented in Table 5.26, Table 5.27 and Table 5.28. A medium correlation was found between question B8 ("The relationship between me and the coach is healthy and effective") and B62 ("I go beyond myself to a higher state or place of being while on the field") for the study's A-team (r=0,357 at the 0,05 Sig. 2-tailed level).

Table 5.26 Spearman's rho Correlation on Section B questions for study's A-team (N=41)

Question	Correlation Coefficient and Sig. (2-tailed)	B8	B62
B8	Corr. Coeff.	1,000	0,357[*]
	Sig.	.	0,022
B62	Corr. Coeff.	0,357[*]	1,000
	Sig.	0,022	.

* Correlation is significant at the 0,05 level (2-tailed).

Table 5.27 Spearman's rho Correlation on Section B questions for study's B-team (N=33)

Question	Correlation Coefficient and Sig. (2-tailed)	B16	B19	B49	B53	B54	B57	B58
B16	Corr. Coeff.	1,000	0,027	0,278	0,096	0,331	0,222	0,380[*]
	Sig.	.	0,883	0,117	0,594	0,060	0,215	0,029
B19	Corr. Coeff.	0,027	1,000	0,208	0,013	-0,048	0,081	0,310
	Sig.	0,883	.	0,245	0,945	0,792	0,656	0,079
B49	Corr. Coeff.	0,278	0,208	1,000	0,095	0,133	0,347[*]	0,110
	Sig.	0,117	0,245	.	0,600	0,461	0,048	0,542
B53	Corr. Coeff.	0,096	0,013	0,095	1,000	0,322	0,045	-0,178
	Sig.	0,594	0,945	0,600	.	0,068	0,806	0,321
B54	Corr. Coeff.	0,331	-0,048	0,133	0,322	1,000	-0,059	0,000
	Sig.	0,060	0,792	0,461	0,068	.	0,746	0,998
B57	Corr. Coeff.	0,222	0,081	0,347[*]	0,045	-0,059	1,000	0,121
	Sig.	0,215	0,656	0,048	0,806	0,746	.	0,501
B58	Corr. Coeff.	0,380[*]	0,310	0,110	-0,178	0,000	0,121	1,000
	Sig.	0,029	0,079	0,542	0,321	0,998	0,501	.

* Correlation is significant at the 0,05 level (2-tailed).

Table 5.28   Spearman's rho Correlation on Section C questions for study's B-team (N=33)

Question	Correlation Coefficient and Sig. (2-tailed)	C1	C2	C4	C12	C15	C18	C20	C25	C35	C44	C45	C48	C61
C1	Corr. Coeff.	1,000	0,226	0,127	0,120	0,403[*]	0,003	0,183	0,144	0,165	0,250	0,315	0,189	-0,027
	Sig.	.	0,205	0,482	0,505	0,020	0,986	0,307	0,423	0,359	0,160	0,074	0,292	0,882
C2	Corr. Coeff.	0,226	1,000	0,219	0,238	0,102	0,442[**]	0,287	0,232	0,373[*]	0,059	0,348[*]	0,353[*]	0,054
	Sig.	0,205	.	0,221	0,183	0,574	0,010	0,105	0,194	0,033	0,746	0,047	0,044	0,764
C4	Corr. Coeff.	0,127	0,219	1,000	0,131	0,230	0,233	-0,046	-0,049	0,327	0,163	0,239	0,254	0,137
	Sig.	0,482	0,221	.	0,468	0,198	0,192	0,798	0,786	0,063	0,366	0,180	0,153	0,448
C12	Corr. Coeff.	0,120	0,238	0,131	1,000	0,190	0,295	0,132	0,293	0,111	0,157	0,091	0,266	0,182
	Sig.	0,505	0,183	0,468	.	0,290	0,096	0,463	0,099	0,537	0,384	0,615	0,134	0,312
C15	Corr. Coeff.	0,403[*]	0,102	0,230	0,190	1,000	-0,137	0,086	0,134	0,075	0,397[*]	0,258	0,311	0,375[*]
	Sig.	0,020	0,574	0,198	0,290	.	0,445	0,634	0,456	0,678	0,022	0,147	0,078	0,031
C18	Corr. Coeff.	0,003	0,442[**]	0,233	0,295	-0,137	1,000	0,512[**]	0,213	0,428[*]	0,173	0,102	0,154	0,126
	Sig.	0,986	0,010	0,192	0,096	0,445	.	0,002	0,234	0,013	0,335	0,574	0,393	0,484
C20	Corr. Coeff.	0,183	0,287	-0,046	0,132	0,086	0,512[**]	1,000	0,162	0,191	0,074	-0,011	0,223	0,194
	Sig.	0,307	0,105	0,798	0,463	0,634	0,002	.	0,368	0,286	0,684	0,953	0,212	0,279
C25	Corr. Coeff.	0,144	0,232	-0,049	0,293	0,134	0,213	0,162	1,000	0,220	0,259	0,067	0,242	0,251
	Sig.	0,423	0,194	0,786	0,099	0,456	0,234	0,368	.	0,218	0,146	0,712	0,175	0,159
C35	Corr. Coeff.	0,165	0,373[*]	0,327	0,111	0,075	0,428[*]	0,191	0,220	1,000	0,426[*]	0,291	0,488[**]	0,338
	Sig.	0,359	0,033	0,063	0,537	0,678	0,013	0,286	0,218	.	0,014	0,101	0,004	0,054
C44	Corr. Coeff.	0,250	0,059	0,163	0,157	0,397[*]	0,173	0,074	0,259	0,426[*]	1,000	0,511[**]	0,472[**]	0,314
	Sig.	0,160	0,746	0,366	0,384	0,022	0,335	0,684	0,146	0,014	.	0,002	0,006	0,075
C45	Corr. Coeff.	0,315	0,348[*]	0,239	0,091	0,258	0,102	-0,011	0,067	0,291	0,511[**]	1,000	0,266	0,006
	Sig.	0,074	0,047	0,180	0,615	0,147	0,574	0,953	0,712	0,101	0,002	.	0,135	0,974
C48	Corr. Coeff.	0,189	0,353[*]	0,254	0,266	0,311	0,154	0,223	0,242	0,488[**]	0,472[**]	0,266	1,000	0,313
	Sig.	0,292	0,044	0,153	0,134	0,078	0,393	0,212	0,175	0,004	0,006	0,135	.	0,076
C61	Corr. Coeff.	-0,027	0,054	0,137	0,182	0,375[*]	0,126	0,194	0,251	0,338	0,314	0,006	0,313	1,000
	Sig.	0,882	0,764	0,448	0,312	0,031	0,484	0,279	0,159	0,054	0,075	0,974	0,076	.

** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).

Results from the Spearman Rank Order Correlation indicated medium correlations between question B16 ("I have the ability to execute two tasks or actions at the same time and equally well") and B58 ("I can bounce back from failure") for the B-team (r=0,380 at the 0,05 Sig. 2-tailed level) as well as question B49 ("I complete the task to achieve my own set standard of

performance") and B57 ("I have the 'natural' ability with regards to certain skills such as 'ball sense'") (r=0,347 at the 0,05 Sig. 2-tailed level).

Strong correlations were found relating to the questions in Section C for the study's B-team. The strongest correlation existed between question C18 ("I can easily recognise feelings in other players") and C20 ("I can easily pick up what others are feeling via their body language") (r=0,512 at the 0,01 Sig. 2-tailed level), and between question C44 ("I have intense feelings of well-being and happiness") and C45 ("I have realistic feelings about myself") (r=0,511 at the 0,01 Sig. 2-tailed level). Medium correlations were found between question C35 ("I understand the emotions experienced by other players during a game") and C48 ("I generally have feelings of trust for other members of the team") (r=0,488 at the 0,01 Sig. 2-tailed level), between question C44 ("I have intense feelings of well-being and happiness") and C48 ("I generally have feelings of trust for other members of the team") (r=0,472 at the 0,01 Sig. 2-tailed level), and between question C2 ("I am aware of my own feelings when I perform in my sport") and C18 ("I can easily recognize feelings in other players") (r=0,442 at the 0,01 Sig. 2-tailed level).

Further significant medium correlations also existed at the 0,05 Sig. 2-tailed level between question C18 ("I can easily recognize feelings in other players") and C35 ("I understand the emotions experienced by other players during a game") (r=0,428). This was also found between question C35 ("I understand the emotions experienced by other players during a game") and C44 ("I have intense feelings of well-being and happiness") (r=0,426), and between question C1 ("In general I have strong feelings of self-worth, self-esteem and self-respect") and C15 ("I value myself very highly") (r=0,403). A number of other questions also presented significant correlations between them at the 0,05 level (2-tailed) ranging from r=0,300 to 0,399.

The correlations between predictors and sub-scales for both teams as well as between particular questions on which the two teams significantly differed would become useful in analysing and interpreting results later on.

5.2.6 Logistic Regression

Logistic Regression was used to test the study's hypothesis in terms of determining how emotional intelligence could serve as predictor of group membership as well as to explore the relationship and strength thereof amongst the other predictors (N=74). The predictor models were used for this purpose. The Binary Logistic Regression analysis method in SPSS produced outputs by making use of team standing (study's A-team or study's B-team) as the dependent variable for rugby performance and the various predictors in model combinations of a maximum of seven as independent variables or covariates to test the hypothesis formula as follows:

Rugby performance (team standing) = Function of (demographical predictor 1 + demographical predictor 2 + ... + physical, psychological, social, or spiritual aspects predictor 1 + physical, psychological, social, or spiritual aspects predictor 2 + ... + emotional aspects (emotional intelligence) predictor 1 + emotional aspects (emotional intelligence) predictor 2 + ...).

5.2.6.1 Multicollinearity

Testing for multicollinearity in SPSS between all predictors chosen for use in the study (see Chapter 4) revealed that all tolerance values (obtained from the 'Collinearity Statistics' column in the 'Linear Regression Analysis Coefficients' output table) were between 0,128 and 0,574, therefore suggesting they are not strongly correlated to each other[9]. All variables were thereby accepted for inclusion into the models. Results are presented in Table 5.29.

In addition, Bivariate Correlation analysis performed on all the predictors also indicated no correlations equal or above 0,9 for both Pearson and Spearman's rho Correlation (all r<0,8). This result therefore showed that the predictors were not too strongly correlated to each other, which could imply predictors were measuring the same concept (Pallant, 2006).

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[9] Pallant (2006) suggested predictor variables not to be strongly related to each other where strong relations are indicated by tolerance values lower than 0,1.

Table 5.29 Collinearity statistics tolerance values for all predictors (N=74)

Predictor	Collinearity statistics		Predictor	Collinearity statistics		Predictor	Collinearity statistics	
	Tolerance	VIF		Tolerance	VIF		Tolerance	VIF
Age	0,549	1,820	**Coach and coach-athlete relationship**	0,338	2,962	**Empathy**	0,144	6,945
Weight	0,293	3,417	**Team-cohesion**	0,278	3,594	**Social responsibility**	0,181	5,539
Length	0,367	2,724	**Talent and physical attributes**	0,242	4,127	**Interpersonal relationship**	0,222	4,512
Time practice	0,534	1,873	**Spiritual aspects (religious)**	0,337	2,968	**Stress tolerance**	0,149	6,696
Participation in rugby	0,574	1,742	**Spiritual aspects (purpose and meaning)**	0,322	3,109	**Impulse control**	0,232	4,311
Mark for grade passed	0,532	1,880	**Spiritual aspects (higher state)**	0,439	2,279	**Reality-testing**	0,212	4,721
Mental toughness	0,217	4,606	**Self-regard**	0,208	4,804	**Flexibility**	0,169	5,923
Motivation	0,203	4,915	**Emotional self-awareness**	0,176	5,666	**Problem-solving**	0,214	4,667
Focus	0,404	2,478	**Assertiveness**	0,158	6,322	**Optimism**	0,278	3,602
Personal attributes	0,217	4,599	**Independence**	0,128	7,790	**Happiness**	0,182	5,505
Mental imagery	0,286	3,496	**Self-actualisation**	0,219	4,567			

Correlation analysis between the predictors and the independent variable (or team standing) indicated six predictors significantly correlating therewith ($p<0,05$ and $r>0,24$), namely age, participation in rugby, spiritual aspects (higher state), self-regard, empathy, reality-testing, and happiness (N=74) (see Table 5.30). Medium positive correlations were found between team standing and age ($r=0,374$; $p=0,001$), and team standing and participation in rugby ($r=0,377$; $p=0,001$). A smaller positive correlation existed between team standing and spiritual aspects (higher state) ($r=0,240$; $p=0,040$). Medium negative correlations were found between team standing and reality-testing ($r=-0,327$; $p=0,004$), and between team standing and happiness ($r=-0,336$; $p=0,003$). Smaller negative correlations were found between team standing and self-regard ($r=-0,264$; $p=0,023$), and between team standing and empathy ($r=-0,246$; $p=0,034$). A final model

combination for Logistic Regression analysis was created containing these predictors (ie age, participation in rugby, spiritual aspects (higher state), self-regard, empathy, reality-testing and happiness).

Table 5.30 Spearman's rho Correlation between predictors (independent variables) and team standing (dependent variable) for model 8 (N=74)

Statistic	Age	Participation in rugby	Spiritual aspects (higher state)	Self-regard	Empathy	Reality-testing	Happiness
Correlation Coefficient	0,374[**]	0,377[**]	0,240[*]	-0,264[*]	-0,246[*]	-0,327[**]	-0,336[**]
Sig. (2-tailed)	0,001	0,001	0,040	0,023	0,034	0,004	0,003

** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).

5.2.6.2 Model combinations

The Logistic Regression analysis conducted on all the models produced information regarding their worthiness and appropriateness to predict or explain the dependent variable. Results obtained will be presented for each model.

- **Model 1**

    Formula: Rugby performance = Function of (age + weight + mental toughness + personal attributes and attitude + stress tolerance + impulse control + flexibility)

The SPSS output for model 1 indicated an initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). From the variables not in the equation table, age was found to be significant at the 0,05 significance level (p=0,001).

The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 17,772 (p=0,013; df=7) for the model including the independent variables or predictors. The Hosmer-Lemeshow Goodness of Fit Test presented a significance value above 0,05 (p=1,000; Chi-square=0,619; df=8). The -2 Log Likelihood value was 83,947, Cox and Snell R square value

0,213, with Nagelkerke R square value 0,286. The overall percentage of correctly classified cases improved to 68,90%. For variables in the equation, only age was found to be significant (p=0,004) with Exp (B)=3,849 and 95% Confidence Interval for Exp (B) between 1,538 and 9,633.

- **Model 2**

    Formula: Rugby performance = Function of (age + length + focus + mental imagery + independence + problem-solving + optimism)

SPSS results for model 2 indicated the same initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). From the variables not in the equation table, only age was found to be significant at the 0,05 significance level (p=0,001).

The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 18,386 (p=0,01; df=7) for the model including the independent predictors. The Hosmer-Lemeshow Test presented a significance value above 0,05 (p=0,417; Chi-square=8,165; df=8). The -2 Log Likelihood value was 83,334, Cox and Snell R square value 0,220, with Nagelkerke R square value 0,294. The overall percentage of correctly classified cases improved to 63,50%. For variables in the equation, only age again was found to be significant (p=0,002) with Exp (B)=4,410 and 95% Confidence Interval for Exp (B) between 1,749 and 11,121.

- **Model 3**

    Formula: Rugby performance = Function of (time practise + participation in rugby + motivation + talent and physical attributes + self-regard + assertiveness + self-actualisation)

Results for model 3 presented the same initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables

(N=74). From the variables not in the equation table, participation in rugby was found to be significant at the 0,05 significance level (p=0,001) as well as self-regard (p=0,018). The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 27,649 (p=0,000; df=7) for the model including the independent variables.

The Hosmer-Lemeshow Test presented a significance value below 0,05 (p=0,046; Chi-square=15,734; df=8). The -2 Log Likelihood value was 74,070, Cox and Snell R square value 0,312, with Nagelkerke R square value 0,417. The overall percentage of correctly classified cases improved to 78,40%. For variables in the equation, both time practise and participation in rugby was found to be significant at the 0,05 significance level (p=0,014 and p=0,002 respectively). Time practise had an Exp (B)=1,311 and 95% Confidence Interval for Exp (B) between 1,055 and 1,629. Participation in rugby had an Exp (B)=2,416 and 95% Confidence Interval for Exp (B) between 1,381 and 4,229.

- **Model 4**

    Formula: Rugby performance = Function of (time practise + mark for grade passed + spiritual aspects (purpose and meaning) + spiritual aspects (higher state) + emotional self-awareness + empathy + happiness)

For model 4, results showed again an initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases without the independent variables (N=74). The variables not in the equation table indicated significance at the 0,05 significance level for spiritual aspects (higher state) and happiness (p=0,027 and p=0,004 respectively). The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 19,166 (p=0,008; df=7) for the model with the independent variables included.

The Hosmer-Lemeshow Test presented a significance value above 0,050 (p=0,365; Chi-square=8,736; df=8). The -2 Log Likelihood value was 82,553, Cox and Snell R square value 0,228, with Nagelkerke R square value 0,305. The overall percentage of correctly classified cases improved to 68,90%. From the variables in the equation table it was found that spiritual

aspects (higher state) was significant at the 0,05 significance level (p=0,015). The Exp (B) value for spiritual aspects (higher state) was 2,291 with the 95% Confidence Interval for Exp (B) between 1,173 and 4,473.

- **Model 5**

    Formula: Rugby performance = Function of (participation in rugby + coaching and coach-athlete relationship + team-cohesion + spiritual aspects (religious) + social responsibility + interpersonal relationship + reality-testing)

Model 5 results had a similar initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). The variables not in the equation table indicated significance at the 0,05 significance level for participation in rugby (p=0,002) and reality-testing (p=0,008). The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 24,733 (p=0,001; df=7) for the model including the independent variables.

The Hosmer-Lemeshow Test presented a significance value above 0,05 (p=0,653; Chi-square=5,951; df=8). The -2 Log Likelihood value was 76,987, Cox and Snell R square value 0,284, with Nagelkerke R square value 0,380. The overall percentage of correctly classified cases improved to 74,30%. For variables in the equation, only participation in rugby was found to be significant at the 0,05 significance level (p=0,004). Participation in rugby had an Exp (B)=1,897 and 95% Confidence Interval for Exp (B) between 1,221 and 2,948.

- **Model 6**

    Formula: Rugby performance = Function of (age + time practise + participation in rugby + other predictors 1 + other predictors 2 + emotional predictors 1 + emotional predictors 2)

Model 6, again presented an initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). The variables not in the equation table indicated age, participation in rugby, other predictors 1, and emotional predictors 2 to be significant at the 0,05 significance level (p=0,001; p=0,002; p=0,038 and p=0,035 respectively). A significant Chi-square value of 34,073 (p=0,000; df=7) for the model including the independent variables was presented by the Omnibus Tests of Model Coefficients.

The Hosmer-Lemeshow Test showed a significance value above 0,05 (p=0,673; Chi-square=5,770; df=8). The Model Summary indicated the -2 Log Likelihood value to be 67,647, Cox and Snell R square value 0,369, with Nagelkerke R square value 0,494. The overall percentage of correctly classified cases improved to 77%. The variables in the equation found to be significant at the 0,05 significance level included age, participation in rugby and other predictors 2 (p=0,040, p=0,035 and p=0,013 respectively). Age had an Exp (B)=2,914 and 95% Confidence Interval for Exp (B) between 1,051 and 8,081; participation in rugby an Exp (B)=1,650 with 95% Confidence Interval for Exp (B) between 1,036 and 2,627; and other predictors 2 an Exp (B)=5,458 with 95% Confidence Interval for Exp (B) between 1,426 and 20,895.

- **Model 7**

  Formula: Rugby performance = Function of (age + weight + length + time practise + participation in rugby + total physical, psychological, social and spiritual competence + total emotional intelligence competence)

Results for model 7 indicated an initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). The variables not in the equation table indicated age and participation in rugby to be significant at the 0,05 significance level (p=0,001 and p=0,002 respectively). A significant Chi-square value of 25,832 (p=0,001; df=7) for the model including the independent variables was presented by the Omnibus Tests of Model Coefficients.

The Hosmer-Lemeshow Test presented a significance value above 0,050 (p=0,152; Chi-square=11,974; df=8). The -2 Log Likelihood value was 75,887, Cox and Snell R square value 0,295 with Nagelkerke R square value 0,394. The overall percentage of correctly classified cases improved to 73%. For variables in the equation, age and participation in rugby was found to be significant at the 0,05 significance level (p=0,030 and p=0,026 respectively). Age had an Exp (B)=2,858 and 95% Confidence Interval for Exp (B) between 1,105 and 7,391 whereas participation in rugby had an Exp (B)=1,635 and 95% Confidence Interval for Exp (B) between 1,060 and 2,523.

- **Model 8**

Formula: Rugby performance = Function of (age + participation in rugby + spiritual aspects (higher state) + self-regard + empathy + reality-testing + happiness)

The results for model 8 indicated an initial -2 Log Likelihood value of 101,719 and overall percentage of 55,40% for correctly classified cases excluding the independent variables (N=74). The variables not in the equation table were all significant at the 0,05 significance level, except for empathy (see Table 5.31).

Table 5.31 Logistic Regression: Variables not in the equation for model 8 (N=74)

Step	Variables	Score	df	Sig.
0	**Age**	10,847	1	0,001
	Participation in rugby	9,298	1	0,002
	Spiritual aspects (higher state)	4,873	1	0,027
	Self-regard	5,564	1	0,018
	Empathy	3,756	1	0,053
	Reality-testing	7,048	1	0,008
	Happiness	8,114	1	0,004
	Overall Statistics	31,007	7	0,000

Age, participation in rugby, spiritual aspects (higher state), self-regard, reality-testing, and happiness were significant at the 0,05 significance level (p=0,001, p=0,002, p=0,027, p=0,018, p=0,008 and p=0,004 respectively). The Omnibus Tests of Model Coefficients presented a significant Chi-square value of 39,078 (p=0,000; df=7) for the model including the independent variables (see Table 5.32).

Table 5.32 Logistic Regression: Omnibus Tests of Model Coefficients for model 8 (N=74)

Step		Chi-square	df	Sig.
	Step	39,078	7	0,000
1	**Block**	39,078	7	0,000
	Model	39,078	7	0,000

The Hosmer-Lemeshow Test presented a significance value above 0,05 (p=0,254; Chi-square=10,160; df=8) (see Table 5.33).

Table 5.33 Logistic Regression: Hosmer and Lemeshow Test for model 8 (N=74)

Step	Chi-square	df	Sig.
1	10,160	8	0,254

The -2 Log Likelihood value was 62,641, Cox and Snell R square value 0,410, with Nagelkerke R square value 0,549 (see Table 5.34). The overall percentage of correctly classified cases improved to 83,80%.

Table 5.34 Logistic Regression: Model summary for model 8 (N=74)

Step	-2 Log likelihood	Cox and Snell R	Nagelkerke R Square
1	62,641[a]	0,410	0,549

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than 0,001.

Significant predictors at the 0,05 significance level found in the variables in the equation table included age, participation in rugby and spiritual aspects (higher state) (p=0,036, p=0,030 and p=0,003 respectively) (see Table 5.35).

Table 5.35 Logistic Regression: Variables in the equation for model 8 (N=74)

Step	Predictors	B	S.E.	Wald	df	Sig.	Exp (B)	95% C.I. for Exp (B)	
1ª	Age	1,140	0,544	4,389	1	0,036	3,128	1,076	9,092
	Participation in rugby	0,582	0,268	4,710	1	0,030	1,790	1,058	3,029
	Spiritual aspects (higher state)	1,261	0,418	9,086	1	0,003	3,527	1,554	8,006
	Self-regard	-1,215	0,777	2,446	1	0,118	0,297	0,065	1,360
	Empathy	-0,133	0,674	0,039	1	0,843	0,875	0,234	3,281
	Reality-testing	-1,383	0,938	2,172	1	0,140	0,251	0,040	1,578
	Happiness	0,231	0,893	0,067	1	0,796	1,260	0,219	7,261
	Constant	-21,163	10,087	4,402	1	0,036	0,000		

a. Variable(s) entered on step 1: Age, participation in rugby, spiritual aspects (higher state), self-regard, empathy, reality-testing, and happiness.

Age had an Exp (B)=3,128 and 95% Confidence Interval for Exp (B) between 1,076 and 9,092; participation in rugby an Exp (B)=1,790 and 95% Confidence Interval for Exp (B) between 1,058 and 3,029; and spiritual aspects (higher state) an Exp (B)=3,527 with 95% Confidence Interval for Exp (B) between 1,554 and 8,006.

5.3   SUMMARY

Data analysis results for the 74 respondents used as the study's sample group were obtained from the various SPSS outputs. These results included descriptive statistics, reliability analysis, factor analysis, non-parametric statistics and Logistic Regression analysis outputs. In Chapter 6 analysis of the results and interpretation thereof will be discussed.

CHAPTER 6

ANALYSIS AND INTERPRETATION OF RESULTS

6.1   INTRODUCTION

In the previous chapter the results obtained from the SPSS output for the current study were presented. In this chapter these findings will be discussed and interpreted to enable the researcher to come to certain conclusions and to make recommendations to be presented in the final chapter.

6.2   ANALYSIS OF RESULTS

6.2.1   Descriptive statistics

The final study group of 74 participants was drawn from an original group of 100 participants. The main reason for this was that these participants have all completed all the questions contained in Section B and Section C in the questionnaire, all of them have completed six of the demographical questions and they were all rugby players from the four participating high school's first and second rugby teams (in other words the two most senior teams). The average age of these players was 17,42 years. These players as a group had an average school mark for the previous year passed of 67,80% which seems fairly high. From the average weight and length statistics it also seems that these players as a group are above average with statistics of 86,14 kilograms and 183,05 centimetres respectively. On average they have been participating in rugby for almost 11 years and they are practicing more than eight hours per week.

The study group, when divided into the two groups of either an A-team or B-team, presented interesting comparative demographical statistics. The A-team players were on average older, faster in terms of 100 metres sprint, and stronger in terms of weight lifted in kilograms than the B-team players. They participated in rugby and sport in general for longer and practised more hours per week. The B-team players in turn were on average slightly taller and had a higher mark

for the previous grade passed than the A-team. In terms of weight the two teams were almost exactly the same.

Although these descriptive statistics indicated interesting results, it was still to be determined if demographical differences between the two teams were statistically significant.

6.2.2 Reliability statistics

Exploratory and formal reliability analysis were conducted on the total initial group of 100 participants to determine if the predictor variable scales and sub-scales were reliable in measuring what it was intended to measure. The results obtained guided the researcher to re-construct the scales and sub-scales in such a manner to ensure optimal reliability. For this purpose the Cronbach Alpha coefficient was used as well as inter-item correlations.

It was found that the original nine predictors contained in Section B in the questionnaire, could still be used as constructed through the literature review with the exception of focus and spiritual aspects. Focus was adapted by eliminating questions B40 and B45 from the scale while retaining the concept thereof due to the nature of the questions and/or low inter-item correlation within the scale. A too low Cronbach Alpha coefficient and inter-item correlations for the spiritual aspects scale compelled the researcher to adapt the scale. The spiritual aspects predictor was divided into three new sub-scales each measuring a sub-concept thereof namely spiritual aspects (religious), spiritual aspects (purpose and meaning) and spiritual aspects (higher state). This resulted in maintaining parts of the original intended concept by measuring each part (ie the new sub-concepts) through a question (ie B13, B48, and B62) maintained from the original predictor scale. This resulted in the exclusion of questions B6, B20, B31 and B41 originally part of the combined spiritual aspects predictor scale.

Exploratory reliability analysis results for Section C in the questionnaire led to the alteration of the independence, social responsibility and impulse control sub-scales. This was due to too low Cronbach Alpha coefficients and negative inter-item correlations. This led to excluding questions C51Recoded, C21Recoded and C54Recoded from the respective sub-scales. Exclusion of

questions C10 and C65 from the optimism sub-scale and the questionnaire in total presented no problem in terms of reliability analysis results while still maintaining the concept thereof.

In conclusion, the nine original variable concepts in Section B in the questionnaire and 15 sub-scale concepts of the emotional intelligence predictor in Section C in the questionnaire were retained for further use in analysis.

6.2.3 Factor analysis statistics

In general, the SPSS results indicating factor loadings, extraction of factors and percentages of variance explained, were used in exploration of how the two sample groups (N=100 and N=74) best understood the data to be grouped together in more meaningful components. Exploratory factor analysis took place on the data of both groups, while formal factor analysis only took place with regards to the data of the final study group (N=74).

6.2.3.1 Exploratory factor analysis

Exploratory factor analysis was performed on the responses of the initial group of 100 participants to the questions, original predictor variable scales and sub-scales contained in Section B and Section C in the questionnaire. The main intention was to explore how the questions, scales and sub-scales group together by using Principal Component Analysis in SPSS as well as parallel analysis through Monte Carlo PCA for Parallel Analysis. The outputs were evaluated by inspecting and comparing eigen values above 1. The Scree Plot results also gave an indication of which factors should be retained or extracted. The final technique for determination included inspection of the Correlation Matrix from the SPSS output for correlations of above 0,30. The Varimax Rotation Method's Rotated Component Matrix was also useful in determining how the factors grouped together. Appropriateness of factor analysis was determined through significance from the Bartlett's Test of Sphericity with p<0,05 and the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy being equal or above 0,60.

The factor analysis results for all questions in Section B and Section C in the questionnaire failed to present significance and therefore led to analysing the questions of the two sections separately. Various factors were suggested for retention from the results to the separate questions in Section B and Section C in the questionnaire as well as to the original predictor variable scales and sub-scales. Retention of extracted factors were based on comparing SPSS eigen values of above 1 with Parallel Analysis eigen values of above 1 found to be higher. Results indicated retention of five components for **Section B questions** B1 to B62, five components for Section B **questions** B1 to B62 **excluding** questions B6, B20, B31, B40, B41 and B45 (identified through reliability analysis results) and two components for the **original scales** contained in Section B in the questionnaire and intended to make up the first nine predictors. Results also indicated retention of three components for **Section C questions** C1 to C72 (excluding C10 and C65), two components for Section C **questions** C1 to C72 (excluding C10 and C65) **excluding** questions C21Recoded, C51Recoded and C54Recoded (identified through reliability analysis results) and one component for the **original sub-scales** contained in Section C in the questionnaire and intended to make up the tenth predictor.

Exploratory factor analysis was performed on the responses of the study group of 74 participants to all the new predictor variable scales and sub-scales in Section B and Section C taken together. Parallel analysis could not be performed as at least 100 subjects were required. The SPSS results suggested the retention of two components. The retention of two factors served as confirmation that the two sections of the questionnaire were indeed measuring two separate concepts and considered an indication to use them separately during formal factor analysis.

6.2.3.2 Formal factor analysis

Formal factor analysis was performed on the responses of the group of 74 participants to the new predictor variable scales and sub-scales contained in Section B and Section C in the questionnaire respectively. The intention was to determine how the scales and sub-scales group together for the study group again by using Principal Component Analysis in SPSS and parallel analysis through Monte Carlo PCA for Parallel Analysis. Parallel analysis could not be performed as at least 100 subjects were required. Results from the SPSS output alone were used to determine extraction of

components. Results for the **new scales** for the predictors measuring physical, psychological, social and spiritual aspects related to sport performance and contained in Section B in the questionnaire, suggested retention of two factors. Results for the **new sub-scales** for the predictor measuring emotional aspects related to sport performance and contained in Section C in the questionnaire, also suggested retention of two factors.

The components as suggested by the SPSS output were used as separate predictors called other predictors 1, other predictors 2, emotional predictors 1, and emotional predictors 2, which were used in combination with demographical predictors in a model for Logistic Regression analysis.

6.2.4 Mann-Whitney Test statistics

The Mann-Whitney Test was primarily used to compare the A-team and the B-team of the study to determine whether the two groups differed significantly in terms of emotional intelligence (N=74). No significant difference at the 0,05 level of significance was found between the two groups for total emotional intelligence or any of the five domains (as constructed by Bar-On, 2006) of the emotional intelligence predictor. There was, however, an indication of significant difference in favour of the B-team at the 0,10 level of significance on total emotional intelligence and specifically the emotional intelligence domains of adaptability (including reality-testing, flexibility and problem-solving), and general mood (including optimism and happiness). This significance level was however not applicable to the study. The Mann-Whitney Test was further used to investigate if any other significant differences in terms of demographical variables, questions in Section B and Section C, and any of the physical, psychological, social, spiritual and emotional aspects predictor scales or sub-scales existed.

By comparing responses to demographical variables, significant differences (p<0,05) existed for age, participation in rugby, and grade passed in favour of the A-team. The B-team also significantly differed from the A-team by having a higher heart rate before 100m sprint and longer time for 100m sprint. School grade passed, heart rate before 100m sprint, and time for 100m sprint were not completed by all 74 participating players and could therefore not be used further.

By comparing the two groups on questions in Section B, significant differences (p<0,05) existed for 'The relationship between me and the coach is healthy and effective', and 'I go beyond myself to a higher state or place of being while on the field' in favour of the A-team. The B-team also significantly differed from the A-team on questions phrased 'I have the ability to execute two tasks or actions at the same time and equally well', 'I have the ability to succeed as shown in my family history (eg older family member success)', 'I complete the task to achieve my own set standard of performance', 'We have a strong team spirit', 'I get to a state where I am 'flowing' freely (things just happen spontaneously)', 'I have the 'natural' ability with regards to certain skills such as 'ball sense'', and 'I can bounce back from failure' in its favour.

On questions in Section C the B-team scored significantly (p<0,05) higher than the A-team on the questions 'In general I have strong feelings of self-worth, self-esteem and self-respect', 'I am aware of my own feelings when I perform in my sport', 'I can freely experience my own emotions during a game', 'It is easy for me to adapt to changes experienced in the game', 'I value myself very highly', 'I can easily recognize feelings in other players', 'I can easily pick up what others are feeling via their body language', 'I have happy feelings such as contentment, enthusiasm, satisfaction and joy', 'I understand the emotions experienced by other players during a game', 'I have intense feelings of well-being and happiness', 'I have realistic feelings about myself', 'I generally have feelings of trust for other members of the team', and 'I am in a happy mood most of the time during a game'. No significant difference in favour of the A-team existed on any of the questions in Section C.

Predictor comparisons indicated that the A-team in its favour differed significantly (p<0,05) from the B-team on spiritual aspects (higher state). The B-team, in turn, differed significantly from the A-team on motivation (intrinsic), talent and physical attributes (genes), self-regard, empathy, reality-testing and happiness.

6.2.5   Spearman's Rank Order Correlation statistics

In order to investigate possible relationships between variable predictors and questions used in the study, the researcher performed the Spearman's Rank Order Correlation on the group's

responses (N=74). Spearman's rho indicated significant correlations (r>0,55 at the 0,01 Sig. 2-tailed level) between personal attributes and attitude and talent and physical attributes (the strongest correlation); these two predictors and motivation; personal attributes and attitude and team-cohesion; as well as personal attributes and attitude and mental toughness. Other strong significant correlations found existed between coaching and coach-athlete relationship and motivation; and coaching and coach-athlete relationship and mental imagery (all r>0,55 at the 0,01 Sig. 2-tailed level).

The strongest correlations in terms of the emotional aspects predictor sub-scales were found between emotional self-awareness and independence; independence and empathy; emotional self-awareness and empathy; and happiness and self-regard (all r>0,70 at the 0,01 Sig. 2-tailed level; N=74). Very strong correlations also existed between assertiveness and self-actualisation; assertiveness and emotional self-awareness; assertiveness and social responsibility; empathy and interpersonal relationship; empathy and reality-testing; empathy and social responsibility; interpersonal relationship and emotional self-awareness; and interpersonal relationship and independence (all r between 0,60 and 0,70 at the 0,01 Sig. 2-tailed level). Various other medium to strong correlations also existed between the remaining predictor sub-scales (all r between 0,40 and 0,50 at the 0,01 Sig. 2-tailed level).

Questions on which the A-team and the B-team differed significantly and highlighted during the Mann-Whitney Test analysis only indicated medium correlations for Section B questions performed on both groups separately (r between 0,30 and 0,40 at the 0,05 Sig. 2-tailed level; N=41 and N=33). For Section C questions performed on the B-team, strong correlations was found (r>0,50 at the 0,01 Sig. 2-tailed level; N=33). The two strongest correlations were found between "I can easily recognize feelings in other players' and 'I can easily pick up what others are feeling via their body language'; 'I have intense feelings of well-being and happiness' and 'I have realistic feelings about myself' (r=0,51 and r=0,51 respectively at the 0,01 Sig. 2-tailed level).

Significant medium to strong correlations (r>0,40 at the 0,01 Sig. 2-tailed level; N=33) were also found between 'I understand the emotions experienced by other players during a game' and 'I

generally have feelings of trust for other members of the team'; 'I have intense feelings of well-being and happiness' and 'I generally have feelings of trust for other members of the team'; and 'I am aware of my own feelings when I perform in my sport' and 'I can easily recognize feelings in other players'. Further medium correlations existed in terms of other Section C questions on which the the B-team significantly differed from the A-team (r between 0,34 and 0,43 at the 0,05 Sig. 2-tailed level). It was interesting to see that all the predictor sub-scales significantly correlated with each other.

6.2.6 Logistic Regression statistics

Before the Logistic Regression analysis was performed on the group of 74 participants, testing for multicollinearity took place. All variables chosen were not strongly related to each other (tolerance values above 0,10) and therefore accepted for inclusion in the analysis. In order to, ideally, have variables also being strongly (and significantly) related to the dependent variable, Spearman's rho Correlation was performed between the various predictors and the dependent variable or team standing for investigation (Pallant, 2006). Six predictors were found to meet this criterion (p<0,05) and were therefore used in combination in one of the models (model 8).

The Logistic Regression analysis method was chosen to test the hypothesis to determine how emotional intelligence could serve as a (strong) predictor of rugby performance in relationship to demographical and other predictors. Various predictor combinations were used in models for this purpose. Results showed that some of the models did significantly predict the dependent variable or team membership (either the study's A-team or B-team) as indication of rugby performance. Model 3, however, was considered not to be useful as the Hosmer-Lemeshow Test indicated a significance value below 0,05 (p=0,046). Other models, although significant in terms of the Hosmer-Lemeshow Test indication, were discarded based on the presentation of a Nagelkerke R square value below 0,49. In other words, those models explaining variability below 49% were discarded (r≥0,70 was used as cut-off point[10]). These models included model 1, model 2, model

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[10] The R value is determined by calculating the root of the R square value: √0,49=0,70

4, model 5, and model 7. The two models accepted for testing the hypothesis included model 6 and model 8.

6.2.6.1 Model 6

In model 6, rugby performance indicated through team standing (as independent variable) was tested as a function of the combination of age (in years), time practise (in hours per week), participation in rugby (in years), other (physical, psychological, social or spiritual aspects) predictors 1, other (physical, psychological, social or spiritual aspects) predictors 2, emotional aspects (emotional intelligence) predictors 1 and emotional aspects (emotional intelligence) predictors 2 (as dependent variables). It was found that age, participation in rugby, other predictors 1 and emotional aspects predictors 2 was significant at the 0,05 significance level when considered as non-singular variables (ie in combination with each other). The model with the inclusion of the predictor variables in terms of 'goodness of fit' was highly significant at p<0,0005. This was supported by the Hosmer-Lemeshow Test indicating a significance value above 0,05. In terms of the usefulness of the model, the Nagelkerke R square value suggested that at least 49,40% of the variability is explained by the set of predictors used.

How well the model could predict team standing (in the study's case rugby performance) was indicated as being 77%. The predictors that individually contributed significantly to the predictive ability of the model included age, participation in rugby and other predictors 2 at the 0,05 significance level (p<0,05). The results in terms of the study therefore indicated these predictors as the major factors contributing to rugby performance (or team standing ie being in the study's A-team rather than the B-team). According to the B values (or probability value) it is suggested that an increase in age, participation in rugby and other predictors 2 will increase the likelihood of being included into the A-team, but an increase in other predictors 1, decrease it. The odds ratio (OR) for age, indicated by the Exp (B) value, was found to be 2,91. This suggests the odds of a person being in the study's A-team are 2,91 times higher being one year older than another, all other factors being equal. In other words, the chances of being included into the A-team increases 2,91 times with every one year increase in age. For participation in rugby, a person's chances increase 1,65 times with every one year increase in rugby participation, all other

factors being equal. An increase of one factor to the total response score of other predictors 2 (ie agreeing more in terms of the 5-point Likert scale total score for this predictor), a person increases his chances by 5,46 times to be included into the A-team, all other factors being equal.

6.2.6.2 Model 8

In model 8, rugby performance was tested as a function of the combination of age (in years), participation in rugby (in years), spiritual aspects (higher state), self-regard, empathy, reality-testing and happiness. Results indicated age, participation in rugby, spiritual aspects (higher state), self-regard, reality-testing and happiness to be significant at the 0,05 significance level when considered non-singular. This model with the inclusion of the predictor variables in terms of 'goodness of fit' was highly significant at p<0,0005. This was also supported by the Hosmer-Lemeshow Test indicating a significance value above 0,05. In terms of the usefulness of the model, the Nagelkerke R square value suggested that 54,90% of the variability is explained by the set of predictors used.

How well the model could predict team standing (in the study's case rugby performance) was indicated as being 83,80%. The predictors that individually contributed significantly to the predictive ability of the model included age, participation in rugby and spiritual aspects (higher state) at the 0,05 significance level (p<0,05). These predictors were therefore the study's major factor contributors to rugby performance (or team standing) in terms of the model used. The B (or probability) values suggested that an increase in any one of the three predictors would increase the likelihood of being included into the study's A-team. The OR for age was found to be 3,13 in this model, for participation in rugby it was 1,79 and for spiritual aspects (higher state) found to be 3,53. This suggests the odds of a person being in the study's A-team are 3,13 times higher being one year older than another (or an increase in chances of being included into the A-team by 3,13 times with every one year increase in age), all other factors being equal. For participation in rugby, a person's chances increases 1,79 times with every one year increase in rugby participation, all other factors being equal. An increase of one factor to the total response score of spiritual aspects (higher state) (ie to agree more in terms of the 5-point Likert scale total score for

this predictor), increases a person chances by 3,53 times to be included into the study's A-team, all other factors being equal.

6.3   INTERPRETATION OF RESULTS

6.3.1   The Coach questionnaire

In order to contextualise findings and interpret the results obtained from the questionnaire through the SPSS analysis, the completed Coach questionnaires were taken into account. Team coaches from the five sampling teams used in the study were requested to indicate in a specially designed Coach questionnaire (see Appendix B) the following:

a. Aspects considered **important when selecting a member for the rugby team** (rated in order of importance from 1 to 10, where **1** is the **most important** and **10** the **least important**);

b. Aspects considered important to **distinguish between a member from the rugby A-team and a member from the rugby B-team** (also rated in order of importance from 1 to 10, where **1** is the **most important** and **10** the **least important**); and

c. Indicate to what extent they **agree** that the **ten predictors used for the study** (ie Mental toughness, Motivation, Focus, Personal attributes and Attitude, Mental imagery, Coaching and Coach-athlete relationship, Team-cohesion, Talent and Physical attributes, Spiritual aspects and Emotional intelligence) **are important for a player to perform at his best** and rated on a Likert scale (ranging from "1 – Strongly agree", "2 – Agree", "3 – Maybe/Neutral", "4 – Disagree", "5 – Strongly disagree" and "6 – Do not consider at all").

Four of the five selected schools' coaches identified 43 criteria in total for selecting a player for the rugby team. The one team was not included into the final study group and therefore the criteria obtained from their coach were not used. The different criteria were grouped together by

the researcher to consist of **conditioning** (fitness, size, speed and strength); **skill factors** (position, running, handling, ball, defensive and communication); **other physical factors** (physical ability); **coaching factors** (co-operation, discipline, practice attendance, reliability or availability, respect for coach, teach-ability and work ethics); **personal factors** (attitude, commitment, endurance, focus, handling of pressure, judgement or decision-making, mental toughness or strength, motivation, perseverance and self-discipline); **team factors** (adaptability to team, combination, co-operation, dedication to shared aim, team-cohesion, team player and team relations); **historical factors** (experience, game level, knowledge of the game or rugby sense and talent); **emotional factors** (emotional intelligence, emotions and love for the game); and **external influences** (parent involvement, personal influences, spiritual or relationship with creator, religious influences and social influences).

One of the schools indicated primary and secondary requirements as two selection criteria which were used separately as **primary factors** and **secondary factors** but were unknown to the researcher in terms of what it entailed. The different groupings were then compared concerning average values assigned to it, based on the Likert scale scores obtained. Results are presented in Table 6.1 with an indication of the order of importance for the four schools combined.

From the various criteria for selecting a player for the rugby team presented it is clear that the four schools differed on the criteria itself as well as importance allocated thereto. There were certain criteria, however, which seemed to be typical at these schools such as skills, conditioning, team player and coaching factors in general**.** When considering the groupings assigned by the researcher, it was found that for the four schools in general the most important factors to being selected for a rugby team included **skill factors**, **other physical factors (physical ability)**, **conditioning** and **coaching factors**. Only School B indicated primary and secondary factors as important criteria. External influences were the least important.

It was further interesting to observe that **School A** deemed skill factors (position, running, handling, ball, defensive and communication), personal factors (attitude) and coaching factors (reliability or availability) as the most important; **School B** regarded conditioning (fitness), team factors (team player) and coaching factors (discipline and respect for the coach) most important;

School **C** viewed historical factors (game level and talent), team factors (co-operation with team members), coaching factors (co-operation with coach), skill factors (position, running, handling, ball, defensive and communication) and other physical factors (ability) very important; while **School D1** considered emotional factors (emotional intelligence) and conditioning (strength) to be the most important.

TABLE 6.1 School criteria to be selected for a rugby team in order of importance (N=74)

Ser no	Criteria	School A	School B	School C	School D1	Average	Order of importance
Primary factors			**2,00**			**2,00**	**1**
1	Primary requirements		2,00				
Secondary factors			**3,00**			**3,00**	**2**
2	Secondary requirements		3,00				
Skill factors		**1,00**	**3,00**	**2,40**	**6,00**	**3,10**	**3**
3	Position, running, handling, ball, defensive, communication	1,00	3,00	2,40	6,00		
Other physical factors		**4,00**		**2,50**		**3,25**	**4**
4	Ability (physical)	4,00		2,50			
Conditioning		**3,75**	**1,00**	**4,00**	**4,50**	**3,31**	**5**
5	Conditioning (fitness)	3,50	1,00	4,00			
6	Conditioning (size)			3,00			
7	Conditioning (speed)			5,00	6,00		
8	Conditioning (strength)	4,00		4,00	3,00		
Coaching factors		**4,50**	**2,00**	**5,33**	**5,00**	**4,21**	**6**
9	Co-operation (coach)			2,00			
10	Discipline		2,00	4,00			
11	Practice attendance	7,00					
12	Reliability/availability	2,00					
13	Respect (coaches)		2,00				
14	Teach-ability			10,00			
15	Work ethics				5,00		
Emotional factors		**6,00**		**7,00**	**1,00**	**4,67**	**7**
16	Emotional intelligence				1,00		
17	Emotions			7,00			
18	Love for the game	6,00					
Historical factors				**4,70**		**4,70**	**8**
19	Experience			10,00			
20	Game level			1,00			
21	Knowledge of the game ('rugby sense')			6,00			
22	Talent			1,80			
Team factors		**4,67**	**1,00**	**5,33**	**10,00**	**5,25**	**9**

Ser no	Criteria	School A	School B	School C	School D1	Average	Order of importance
23	Adaptability to team	6,00		5,00			
24	Combination			3,00			
25	Co-operation (team members)			2,00			
26	Dedication to shared aim			7,00			
27	Team-cohesion			7,00			
28	Team player	3,00	1,00	8,00	10,00		
29	Team relations	5,00					
Personal factors		**3,60**		**6,83**	**6,00**	**5,48**	**10**
30	Attitude	1,00		7,00			
31	Commitment			5,50			
32	Endurance	3,00		7,00			
33	Focus			8,50			
34	Handling of pressure				4,00		
35	Judgement/decision-making	3,00					
36	Mental toughness/strength			6,80			
37	Motivation	3,00		4,00			
38	Perseverance			9,00			
39	Self-discipline	8,00			8,00		
External influences		**9,00**		**8,00**		**8,50**	**11**
40	Parent involvement	9,00					
41	Personal influences			8,00			
42	Spiritual/relationship with Creator/religious			9,00			
43	Social influences			7,00			

The same 43 criteria were used by the four schools to distinguish between a member from the A-team and a member from the B-team. Results are presented in Table 6.2. The four schools again differed on the criteria for selecting a player for the A-team as well as importance thereof. The same criteria used to select a player for the rugby team, were also common to the schools in selecting a player for the A-team, namely **skills**, **conditioning**, **team player** and **coaching factors** in general. Again, external influences were considered the least important.

According to the assigned groupings, results showed that the four schools combined regarded **skill factors**, **conditioning**, **other physical factors (ability)** and **coaching factors** as the most important. In comparison with the previous (ie of being selected for the rugby team), conditioning, as criterion, became more important. Again, School B indicated primary and secondary factors as important criteria. Individually the schools differed on the importance of the criteria used. **School A** deemed skill factors (position, running, handling, ball, defensive and

communication), personal factors (attitude) and coaching factors (reliability or availability) as the most important; **School B** regarded conditioning (fitness), team factors (team player) and coaching factors (discipline and respect for the coach) most important; **School C** viewed historical factors (game level and talent), team factors (co-operation with team members), coaching factors (co-operation with coach), skill factors (position, running, handling, ball, defensive and communication) and other physical factors (ability) very important; while **School D1** considered coaching factors (work ethics) and conditioning (strength) to be the most important.

TABLE 6.2   School criteria to distinguish between A-team and B-team players in order of importance (N=74)

Ser no	Criteria	School A	School B	School C	School D1	Average	Order of importance
Primary factors			2,00			2,00	1
1	Primary requirements		2,00				
Secondary factors			3,00			3,00	2
2	Secondary requirements		3,00				
Skill factors		1,00	3,00	2,17	6,00	3,04	3
3	Position, running, handling, ball, defensive, communication	1,00	3,00	2,17	6,00		
Conditioning		3,75	1,00	4,00	3,50	3,06	4
4	Conditioning (fitness)	3,50	1,00	4,00			
5	Conditioning (size)			3,00			
6	Conditioning (speed)			5,00	4,00		
7	Conditioning (strength)	4,00		4,00	3,00		
Other physical factors		4,00		2,50		3,25	5
8	Ability (physical)	4,00		2,50			
Coaching factors		4,50	2,00	5,33	2,00	3,46	6
9	Co-operation (coach)			2,00			
10	Discipline		2,00	4,00			
11	Practice attendance	7,00					
12	Reliability/availability	2,00					
13	Respect (coaches)		2,00				
14	Teach-ability			10,00			
15	Work ethics				2,00		
Historical factors				4,70		4,70	7
16	Experience			10,00			
17	Game level			1,00			
18	Knowledge of the game ('rugby sense')			6,00			
19	Talent			1,80			

Ser no	Criteria	School A	School B	School C	School D1	Average	Order of importance
Team factors		**4,67**	**1,00**	**5,33**	**10,00**	**5,25**	**8**
20	Adaptability to team	6,00		5,00			
21	Combination			3,00			
22	Co-operation (team members)			2,00			
23	Dedication to shared aim			7,00			
24	Team-cohesion			7,00			
25	Team player	3,00	1,00	8,00	10,00		
26	Team relations	5,00					
Personal factors		**3,60**		**6,76**	**5,50**	**5,29**	**9**
27	Attitude	1,00		7,00			
28	Commitment			5,00			
29	Endurance	3,00		7,00			
30	Focus			8,50			
31	Handling of pressure				5,00		
32	Judgement/decision-making	3,00					
33	Mental toughness/strength			6,80			
34	Motivation	3,00		4,00			
35	Perseverance			9,00			
36	Self-discipline	8,00			6,00		
Emotional factors		**6,00**		**7,00**	**7,00**	**6,67**	**10**
37	Emotional intelligence				7,00		
38	Emotions			7,00			
39	Love for the game	6,00					
External influences		**9,00**		**8,00**		**8,50**	**11**
40	Parent involvement	9,00					
41	Personal influences			8,00			
42	Spiritual/relationship with Creator/religious			9,00			
43	Social influences			7,00			

The ten originally defined predictors of the study were evaluated by the coaches by indication of their agreement of the importance thereof for a player to perform at his best. Results are presented in Table 6.3. Considered in combination, the coaches indicated **team-cohesion** (ie 'team spirit', interaction, inter-communication and sharing goals), **coaching and coach-athlete relationship** (ie style, ability, communication and climate), **mental imagery** (ie visualize and mental picture) and **mental toughness** (ie ability to perform under pressure, bounce back from failure) as the most important. **Talent and physical attributes** (ie history, genetics, skills, speed, fitness and strength), **motivation** (ie determined to succeed and motivated by internal desires/external rewards) and **focus** (ie concentrate, and direct attention without being distracted)

were also regarded fairly important. Personal attributes and attitude (ie self-confidence, leadership and setting of goals) and emotional intelligence (ie emotional awareness, regulation, control and management) were found to be less important to them than the others along with spiritual aspects being the least important.

TABLE 6.3   School coaches' evaluation on importance of study predictors in terms of player performance

Ser no	Predictor	School A	School B	School C	School D1	Average	Order of importance
1	Team-cohesion	1,67	1,00	1,33	1,00	**1,25**	**1**
2	Coaching and Coach-athlete relationship	1,00	2,00	1,17	1,00	**1,29**	**2**
3	Mental imagery	1,67	1,00	1,67	1,50	**1,46**	**3**
4	Mental toughness	2,33	1,00	1,50	1,00	**1,46**	**3**
5	Talent and Physical attributes	1,67	2,00	1,33	1,00	**1,50**	**4**
6	Motivation	1,33	2,00	1,17	1,50	**1,50**	**4**
7	Focus	2,00	1,00	1,33	2,00	**1,58**	**5**
8	Personal attributes and Attitude	1,67	2,00	1,83	1,50	**1,75**	**6**
9	Emotional intelligence	1,67	3,00	1,67	1,00	**1,84**	**7**
10	Spiritual aspects	2,33	3,00	3,00	1,50	**2,46**	**8**

Lastly, the coaches were also requested to mention any other aspects important to them when considering best performance. The following comments or other aspects were given:

    a. Off-season and pre-season conditioning enhances general performance.

    b. The will to succeed.

    c. Focus goals on the immediate (or present) situation: Give everything to the team for which you play and do not look beyond to, for example, possible provincial involvement.

    d. To succeed in your goals.

e. Our first team was 'n weak sports team in the school. They have struggled since grade 10 and lost many times. They did not win many games this year.

6.3.2 Interpretation of current study findings

The average age of participants (N=74) was found to be younger than 18 years of age which constituted that participants were still teenagers and not adults yet. Most emotional intelligence research in the past has been done on adults with even less research being conducted at school level within the Exercise and Sport Psychology field. This study has been limited to a specific geographical area utilising a fairly small sample of participants from a limited number of schools. Results would therefore only be interpreted pertaining to these specific schools with the main aim of exposing the underlying aspects influencing the performance of rugby players thereof.

The players from the study group consisted of grade 10, 11 and 12 learners with most of the players being 17 or 18 years old. At these schools, the average school mark for previous grade passed of the participating rugby players was of a fairly high average (above 65%). The players were on average fairly tall (above 1,80 metres) and weighed above 85 kilograms. The average weight they could lift was also above 95 kilograms. Another attribute of the rugby players used in the sample, was that most of them have been playing rugby for more than 10 years. Most of them were also quite dedicated to participate in practice for more than six hours per week (with some of them up to 10 hours per week), notwithstanding that they still had other school related commitments.

It was initially indicated by the demographical data that the A-team players were older than the B-team players. This was later found not to be a significant difference in terms of the Mann-Whitney Test, but through the Logistic Regression Analysis age as predictor was highlighted to have a significant influence on being included into the A-team. A player's chances of being included into the A-team were between 2,91 (model 6) and 3,13 (model 8) times higher with every year's increase of age. It was also found to be true of (years of) participation in rugby. With every year's increase in playing rugby, a player's chances of being included into the A-team were

between 1,65 (model 6) and 1,79 (model 8) times higher. Time practice (hours per week) did not seem to have a significant effect on rugby performance at these schools.

The factor analysis findings resulted in the combination of certain physical, psychological, social and spiritual aspects related to sport performance to form the new predictor other predictors 2. Inclusive of this new predictor was mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state), and coaching and coach-athlete relationship. The combination of these predictors was found to have a significant effect on being included into the A-team at these schools. It was interesting to observe these predictors' relevance in terms of the results of the Mann-Whitney Test, Logistic Regression analysis as well as Coach questionnaire.

The Mann-Whitney Test results showed that the A-team in its favour significantly differed from the B-team on the spiritual aspects (higher state) predictor. As this aspect was measured by one question it meant specifically the A-team players agreed more to the question: "I go beyond myself to a higher state or place of being while on the field". In reference to this spiritual aspect, Parry et al. (2007) mentioned transcendence as a basic motivation for athletes to succeed while Aitken (1992) talked about athletes' aspiration to excel. It could be concluded that in the study's case, the A-team players experienced this state more often than the B-team players. This would be expected of the better performing player or A-team player, as this higher state is also associated with peak performance (Jackson & Csikszentmihalyi, 1999; Johnson & Tenenbaum, 2006; Krane & Williams, 2006). The spiritual aspects (higher state) predictor was further found to be significant in model 8 of the Logistic Regression analysis, predicting the odds of a person being included into the study's A-team as 3,53 times higher than that of a B-team player, considering the variables used in combination explained 54,90% of the variability.

The Logistic Regression analysis did not indicated significant influences for mental imagery, spiritual aspects (purpose and meaning), and coaching and coach-athlete relationship as singular variables. The Mann-Whitney Test results, however, indicated that the A-team players did agree more to the question: 'The relationship between me and the coach is healthy and effective'. It could therefore be interpreted that the A-team players at these schools generally have a more positive experience of their relationship with the coach than the B-team players. It was also very

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interesting to observe that the predictors 'coaching and coach-athlete relationship' and 'mental imagery' were rated second and third in terms of importance to player performance by the coaches in the Coach questionnaire. Thus supporting the findings from the Logistic Regression analysis that 'other predictors 2' in model 6 (which amongst others included these two predictors), predicted the odds for a player to be included into the study's A-team as 5,46 times higher than for a person in the B-team.

The Mann-Whitney Test was chosen, primarily to test the study hypothesis suggesting that emotional intelligence is a predictor of rugby performance, which was determined through being an A-team player rather than a B-team player. The study's A-team players consisted only of the 'best' school start-up A-team rugby players and the B-team all remaining 'second best' reserves and school B-team start-up players. It was found that in terms of the total emotional intelligence predictor as well as five domains thereof, no significant difference existed between the two teams. The hypothesis was therefore rejected for this study group, which indicated that for these schools emotional intelligence was not a predictor of rugby performance in terms of inclusion into the 'best' A-team as start-up player.

In terms of the study's second hypothesis that emotional intelligence was, in relation to other predictors, a strong predictor of rugby performance, it was found that no significance existed. None of the models used during the Logistics Regression analysis results, indicated emotional intelligence or one of its predictor sub-scales to be significant as singular variables for predicting inclusion into the A-team at these schools. The study's second hypothesis stating that emotional intelligence was a strong predictor of rugby performance (at these schools and in relation to the participating players), was therefore also rejected.

The Mann-Whitney Test results on certain questions relating to emotional intelligence as well as its predictor sub-scales, indicated interesting significant differences (p<0,05). The B-team in its favour significantly differed from the A-team on the self-regard, empathy, reality-testing and happiness sub-scales of emotional intelligence. In support of these findings the B-team also agreed more than the A-team to questions relating to self-worth, self-esteem and self-respect; being aware of own feelings; being able to recognise and understand others' feelings; having

realistic feelings about themselves; and experiencing feelings of happiness, contentment, enthusiasm and joy. Interestingly enough, the A-team players did not significantly differ in their favour from the B-team players on any of the questions or sub-scales relating to emotional intelligence. In addition, with regards to the physical, psychological, social and spiritual aspects questions, the B-team also agreed more than the A-team on questions relating to executing two tasks at the same time; having a strong team spirit; achieving own set standard of performance; getting to a state where things happen spontaneously; and bouncing back from failure.

Regardless of the hypotheses findings, the study exposed certain underlying aspects of emotional intelligence in terms of its sub-scales and questions relating to it, to be significant. The B-team seemed, in comparison to the A-team, to posses more emotional intelligence qualities such as indicated through the self-regard, empathy, reality-testing, and happiness sub-scales. Through correlation analysis, it was also found that B-team players related their well-being feelings to the question of having realistic feelings about themselves and in combination with empathetic feelings towards others to the question relating to feelings of trust for other team members. B-team players were generally happier, recognised and understood other players' feelings more, experienced higher team spirit feelings and evaluated themselves having higher self-esteem than A-team players. In terms of underlying psychological and physical aspects, the B-team's (intrinsic) motivation was also higher than the A-team's as indicated by the Mann-Whitney Test results and they perceived themselves as being more genetically talented, more able to achieve their own set standard of performance, and more able to bounce back from failure than the A-team players.

Certain postulations could be made to interpret these findings. Firstly, B-team players reporting to have more realistic feelings could be the result of being aware of own feelings and recognise and understand others' feelings as well as having to deal with emotions associated with not being included into the school's A-team or being a reserve player. In order to find answers and stay intrinsically motivated, they internally assess various reasons for being excluded by incorporating external factors with internal factors to arrive at a more realistic viewpoint regarding their talents (ie bouncing back from failure). Secondly, it seems that they motivate themselves by means of higher self-regard feelings and enjoyment of the sport, aiming to perform better (achieve own set

standard of performance), which could result in being included into the school's A-team. Thirdly, the study's B-team consisted of players playing for both teams at times and also reserve players, meaning that these players could have gained in experiencing feelings associated with both groups as well as of a larger group of players, thereby having empathy. This would further be supported by their perceptions of being able to execute two tasks at the same time, having a stronger team spirit, and understanding the feelings of others along with feelings of trust for other team members. Fourthly, the perception of genetic predisposition could further support their viewpoint on self-worth and being intrinsically motivated.

The study found that B-team players, as the second best performing players, were more intrinsically motivated, enjoyed their sport, and felt good about themselves concurred with past research investigating motivation and the effect of emotions such as happiness and self-regard on sport performance (Davies, 1989; Franken, 1998; Gendolla et al., 2007; Hanin, 2000a). Walker et al. (2005) viewed that intrinsic motivation is characterised by an athlete's actions being influenced by enjoyment, exclusion of external reward and lack of fear of failure. In interpreting such research and literature, B-team players indicated their determination, persistence, and confidence in themselves along with enjoyment to continue trying to achieve an internal goal such as performing better.

It was pointed out by the Logistic Regression results that a player who was older, had been participating in rugby for a longer period and agreed more to the other predictors 2 predictor (as a combination of mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state) and coaching and coach-athlete relationship), had a better chance of being included into the A-team. In terms of the schools, this was true for the start-up A-team or First-team players playing for this team most of the time during the rugby season. These players also perceived themselves having a significantly healthier and more effective relationship with their coaches. The rest of the players, representing the school's B-team or Second-team and reserve players, perceived themselves having more emotional intelligence qualities, being genetically advantaged, and were able to intrinsically motivate themselves.

As an interest, the Coach questionnaire indicated skills, conditioning, physical ability, coaching factors and team player to be important selection criteria agreed upon by the four school coaches.

There seemed to be no significant difference in terms of the skills[11], conditioning (except perhaps for fitness indicated by heart rate before 100m sprint and time for 100m sprint which was only completed 26 and 68 players respectively) or physical ability when the two teams were compared. The A-team players specified they had a healthy relationship with the coach, which could be supported by the fact that coaches indicated coaching factors as an important criterion for A-team selection. In contrast, with regards to being a team player as selection criterion, study results pointed towards the B-team members perceiving themselves to have more social emotional qualities (such as trust, understanding of others' feelings and team spirit) to constitute a team player.

Through the Coach questionnaire, the coaches indicated the study's team-cohesion predictor as the most important, while mental toughness was regarded the fourth most important. The study findings showed the B-team perceived themselves to possess underlying qualities to these two predictors such as feelings of having a strong team spirit as well as the ability to bounce back from failure. The coaches also in general indicated in the Coach questionnaire that emotional factors played a less important role as selection criterion. This could be another indication of why A-team players had less emotional intelligence qualities than B-team players.

Finally, it was interesting to notice that personal factors such as self-confidence, were not being mentioned by any of the four teams' coaches as an important criterion for inclusion into the A-team. The B-team, in terms of the emotional intelligence sub-scale of self-regard, differed significantly from the A-team as well as various questions pertaining to high self-value, self-worth, self-esteem and self-respect. Furthermore, although they included aspects such as attitude, emotions and love for the game, the schools' criteria did not include aspects such as enjoyment of

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[11] In fact, the B-team players evaluated themselves (through question B57) to have more 'natural' ability with regards to certain skills such as 'ball sense', than the A-team

rugby or being happy while participating in the sport. The B-team players significantly distinguished themselves from the A-team players on the emotional intelligence sub-scale of happiness, signifying they were generally happier than the A-team players.

It could be expected that selection criteria, regarding intrapersonal feelings such as being aware of own feelings and interpersonal feelings such as recognising others' feelings and empathy, would not be considered important in a physical dominating contact sport such as rugby. However, when it accompanies other emotional intelligence qualities such as feelings of self-esteem, being able to pick up what others are feeling via their body language, and being happy, it could be to the advantage of establishing stronger team-cohesion as well as improved emotional intelligent conduct to counter ill-disciplined behaviour on the field resulting from the inability to manage or control emotions.

6.4   CONCLUSION

The analysis of results exposed certain differences between the A-rugby team and the B-rugby team of the study. Emotional intelligence was not a significant predictor (or strong predictor) of rugby performance at the participating schools, used, but interesting observations surfaced which could be (practically) applied to these specific schools as well as specific school situations. Furthermore, although it was hypothesised that the 'best' A-team (as an indication of rugby performance) would consist of having players with significantly higher total emotional intelligence, it was found that the 'second best' B-team consisted of players having certain undeniable emotional intelligence qualities not to be ignored. Such qualities along with the other significant psychological, physical and social aspects qualities identified, could be explored further and utilised to assist the schools in establishing 'better' performing school rugby A-teams.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1   CONCLUSIONS

7.1.1   Summary of findings

The two hypotheses investigated in this study regarding firstly, emotional intelligence as predictor of sport performance and secondly, emotional intelligence as **strong** predictor of sport performance were both rejected in as far as it pertained to the secondary school rugby players who participated in this research project. Results, however, tended to indicate that the study's B-team had a significantly higher overall score on total emotional intelligence (according to the Mann-Whitney Test, at the 0,10 level of significance) and specifically for the emotional intelligence domains of adaptability (including reality-testing, flexibility, and problem-solving) and general mood (including optimism and happiness). The notion that the study's B-team possessed more emotional intelligence qualities was pointed out by the Mann-Whitney Test findings in terms of **certain sub-scales** of emotional intelligence. These sub-scales included self-regard, empathy, reality-testing and happiness. The study's B-team significantly differed from the A-team at the 0,05 level of significance in terms of having higher levels of the aforementioned emotional intelligence attributes.

The study's B-team further differed significantly from the study's A-team on certain questions pertaining to individual emotional aspects. These questions pointed towards the study's B-team, generally: a) having stronger feelings of self-regard and valuing themselves more highly; b) having more realistic feelings about themselves; c) being more aware of their own feelings when performing in sport; d) more freely experiencing own emotions during a rugby game; e) more easily adapting to changes experienced in the game of rugby; f) more easily recognising feelings in other rugby players, picking up what others are feeling via their body language and understanding the emotions experienced by other rugby players during a game; g) having

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stronger feelings of trust for other members of the rugby team; and h) being more often in a happy mood during a rugby game, having more often happy feelings such as contentment, enthusiasm, satisfaction and joy as well as intense feelings of well-being and happiness.

All emotional aspects measured and obtained through the questions of Section C of the questionnaire were related to best sport (rugby) performance as respondents were evaluating themselves in terms of the statement: "**In order for me to be performing at my best...**". It can therefore be concluded that the study's B-team (or the schools' B-team as well as A-team and B-team reserve rugby players) were performing better as a result of certain significant emotional intelligence aspects than the study's A-team (or the schools' A-team start-up rugby players). The study's A-team did not significantly differ from the study's B-team on any of the emotional aspects relating to sport (rugby) performance (ie achieving higher scores on the emotional intelligence sub-scales).

Demographical **predictor** comparisons revealed the study's A-team (in their favour) differing significantly from the study's B-team on age and years of participation in rugby through the Mann-Whitney Test findings. The study's B-team did not differ in their favour from the study's A-team on any of these predictors. Demographical questions were not related to sport performance as questions were straightforward and not stated in terms of the statement: "In order for me to be performing at my best..." (see Appendix A).

In consideration of the physical, psychological, social and spiritual aspects **predictors** relating to sport (rugby) performance, the study's A-team differed only significantly from the study's B-team in terms of the spiritual aspects (higher state) predictor as indicated by the Mann-Whitney Test findings. The study's B-team, on the other hand, differed significantly from the study's A-team on the motivation (intrinsic) and talent and physical attributes (genes) predictors.

With regards to the individual **underlying physical, psychological, social and spiritual aspects** relating to sport performance, the study's A-team differed significantly from the study's B-team only on the social aspect indicating that the relationship between rugby players and the coach/es were healthy and effective, and the spiritual aspect of going beyond themselves to a higher state

or place of being whilst on the rugby field. The study's B-team performed significantly better than the study's A-team in terms of specific psychological, physical, and social aspects such as: a) being able to execute two tasks at the same time and equally well; b) completing a task in achieving an own set standard of performance; c) bouncing back from failure; d) getting to a state where they are 'flowing' freely (or things just happen spontaneously); e) having the ability to succeed as shown in their family history (eg older family member being successful); f) having the 'natural' ability with regards to certain skills such as 'ball sense'; and g) having a strong team spirit, in comparison with the study's A-team. The study's B-team did not perform significantly better on any of the spiritual aspects relating to sport (rugby) performance.

All physical, psychological, social and spiritual aspects measured through the questions in Section B of the questionnaire were also related to best sport (rugby) performance as here too respondents were evaluating themselves in terms of the statement: "In order for me to be performing at my best...".

The study showed through its two main methods used to analyse data that the demographical, physical, psychological, social, spiritual and emotional factors relevant in influencing rugby performance at these schools (in the study presented as inclusion into the study's A-team), differed when used in combination with each other in the models as opposed to when used individually (see Logistic Regression versus Mann-Whitney Test results). It was found that certain demographical, psychological, social, and spiritual factors in combination played a significant role in determining A-team inclusion (see Models 6 and 8 in Logistic Regression results in Chapter 5). These factors were identified as: a) being older in age; c) having participated in rugby for a longer period; d) achieving a higher state while performing on the rugby field; and e) having achieving higher scores on other predictors 2 (ie the combination of mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state), and coaching and coach-athlete relationship). No physical and emotional factors in the combinations used seemed to play a significant role.

One of the main findings of the study, concluded from the factor combinations used during Logistic Regression analysis, entailed how the odds or chances of a rugby player to be selected as

start-up player for the school's A-team would increase in terms of certain predicting factors. For example, with every year being older, the average sample player from the participating schools, had a 2,91 to 3,13 times better chance of playing as start-up player for the A-team (depending on the model used; consideration of age in relation to the other significant predictors used in the model; as well as presupposing all other factors remained the same). Also, with every one unit increase (in terms of the 5-point Likert scale) in agreeing more to achieving a higher state when performing (measured through the spiritual aspects (higher state) predictor scale), the player's chances increased 3,53 times to be included into the study's A-team (ie being a 'best' player). The same applied if the rugby player agreed more to the other predictors 2 scale (consisting of the combination of mental imagery, spiritual aspects (purpose and meaning), spiritual aspects (higher state), and coaching and coach-athlete relationship). In this case a player's chances would have increased by 5,46 times to be included into the 'best' A-team. A summary of the odds ratios (indicating the ratio between the odds of being included into the study's A-team compared to being included into the study's B-team) is presented in Table 7.1.

Table 7.1 Odds ratios (or Exp (B) values) for Logistic Regression model 6 and model 8

Predictor	Age	Years participation in rugby	Spiritual aspects (higher state)	Other predictors 2
Model 6	2,914	1,650		5,458
Sig.	0,040	0,035		0,013
Model 8	3,128	1,790	3,527	
Sig.	0,036	0,030	0,003	

To enhance understanding of study findings, some additional aspects were considered. These aspects included the correlations made by the sample group (N=74) between certain questions and the physical, psychological, social, spiritual and emotional aspect predictors used in the study as well as the selection criteria used by these specific schools and obtained through the Coach questionnaire. According to Spearman's rho Correlation findings the most interesting associations of the respondents were between personal attributes and attitude with team-cohesion, and mental imagery with coaching and coach-athlete relationship. These findings suggested that the rugby players at these schools regarded themselves very much part of the team (having strong interaction and communication amongst members and high team spirit) and that the specific

technique used to create positive mental outcomes is related to the coach's style and abilities as well as their relationship with him. On emotional intelligence aspects, the group linked independence with empathy and interpersonal relationship, which, again, confirmed the suggestion that individuals regard themselves as part of a group. They further linked self-regard with happiness to suggest that being happy is part of having high self-worth.

The A-team linked the relationship between themselves and the coach as being healthy and effective to spiritual aspects (higher state) (or going beyond themselves to a higher state or place of being while on the field). The B-team linked having the ability to execute two tasks or actions at the same time and equally well with bouncing back from failure; completing a task to achieve own set standards of performance and having the "natural" ability with regards to certain skills such as "ball sense"; easily recognising feelings in other players and easily picking up what others are feeling via their body language; as well as having intense feelings of well-being and happiness and having realistic feelings about themselves.

In terms of the most important criteria used by the schools to distinguish between A-team and B-team players, it was found that skills, conditioning, physical and coaching factors took preference whilst emotional factors (including emotional intelligence, emotions and love for the game) and spiritual factors (as part of external influences and including relationship with Creator and religious influences) were considered the least important aspects.

7.1.2   Interpretation in terms of literature

The current study found that certain demographical, psychological, social and spiritual factors played a role in determining sport (rugby) performance. Literature supported the link between peak sport performance and environmental, physical, social, psychological and emotional factors (Dick, 2002; Krane & Williams, 2006; Taylor & Wilson, 2005). The study was however not able to find that physical or emotional factors played a significant role at the participating schools in determining sport performance through being a better performing or start-up A-team rugby player. Various explanations could be offered for this finding.

With regards to the physical factors, the main aim of the study was psychological in nature and the measurement of physical factors was based on self-report. The actual physical performance of players and aspects such as body strength, speed and fitness were not technically measured. Not all participants completed the demographical information that was aimed at supporting questions relating to body strength, speed and fitness such as weight lifted during bench press, time for 100 metres sprint, heart rate before 100 metres sprint, and heart rate after 100 metres sprint. These physical factors were excluded to be investigated as predictors of rugby performance in the study. Demographical information, as mentioned earlier, was also not linked to performance in sport through the way questions regarding it were phrased. The physical aspects predictor in terms of performance only consisted of questions contained in Section B of the questionnaire regarding talent, genetic predispositions and/or hereditary characteristics, historical successes, 'natural' ability with regards to certain skills, and physical attributes (eg body strength, endurance, speed, fitness and flexibility), but as evaluated through the players' own perception thereof.

With regards to the emotional factors determining sport performance, literature as well as the total emotional intelligence scores obtained in the study could provide a possible explanation for emotional intelligence as predictor not playing a significant role in this study. Emotions and emotional experiences are unique to athletes and affect their performance in sport in various ways as suggested by Hanin (2000b). Certain combinations of emotions or patterns of emotion-performance (Hanin's IZOF model) could have positive effects on sport performance and other combinations, negative effects.

In this study's case, the A-team rugby players did not indicate to have specific emotional combinations (constituting emotional intelligence) significantly better than the B-team rugby players. This does not mean that the A-team rugby players did not have high emotional intelligence scores. The average total emotional intelligence scores for the two groups measured by the study were fairly high (A-team=74,63%; B-team=78,18%). The findings indicated both groups to have fairly high emotional intelligence scores, but with no significant difference between them. Both groups could therefore have been performing highly at their separate levels in terms of emotional intelligence. It can therefore be concluded that the study could not indefinitely find that emotional intelligence was **not** a predictor of sport (rugby) performance, but

only that it did not seem to play a role in determining the inclusion into the A-team as start-up rugby player at the four participating schools as singular predictor or in combination with specific other predictors .

One of the most interesting findings from previous studies and suggested through the literature review was that the predictors of sport performance are interlinked in such ways that combinations of predictors are found to collectively influence sport performance. For example, motivation was found to be linked to confidence, goal setting, self- or group efficacy (or self-worth), commitment, mood and emotional state, physical and psychological well-being, and comeback performances (Feltz & Chase, 1998; Kerr, 1997; Kremer & Moran, 2008; Walker et al., 2005; Weinberg & Gould, 2007). Other studies linked focus with mental imagery, goal setting, positive self-talk, and control over emotions; coaching and the relationship between coaches and athletes with athletes' motivation, development of athletes' skills, enhancement of and influence on their confidence levels and feelings which all affects performance (Davies, 1989; Durand-Bush et al., 2006; Jowett et al., 2005; Stratton et al., 2005).

Although the measuring instrument used in this study was designed in such a way as to separate the chosen predictors, the findings of the study suggested the same underlying phenomenon of predictors being linked to each other. Factor analysis indicated this through the component factor loadings while the Spearman Rank Order Correlation also showed various correlations amongst predictors (see Chapter 5). Inter-correlations were still low enough to ensure that predictors could be used separately. The Logistic Regression models were specifically designed to investigate the effect of the combination of predictors on sport (rugby) performance. Especially Model 6, indicated that the psychological aspects predictor mental imagery; spiritual aspects predictors spiritual aspects (purpose and meaning) and spiritual aspects (higher state); as well as social aspects predictor coaching and coach-athlete relationship were interrelated for the study's A-team in terms of their performance during rugby games.

7.1.3   Potential application

Emotional intelligence as selection criterion in being selected for the A-team at the participating schools did not seem to play an important role, as was also indicated by the coaches of these teams. Practical knowledge gained from the study includes the emotional make-up of the B-team players and reserve players which can in future assist coaches and selectors to re-consider them for start-up A-team inclusion. The reasons being that such players (who did not generally differ significantly from the start-up A-team players on most of the demographical, psychological or physical aspects measured by the study) indicated they had a tendency to be more sociable in terms of being a team player, had more regard for themselves, and were more intrinsically motivated in terms of rugby performance.

A re-consideration of emotional intelligence as selection criterion could also be to the advantage of the participating schools as indicated through B-team players and reserve players responding having higher levels of emotional intelligence qualities (such as self-regard, empathy, reality-testing and happiness). These rugby payers also seemed to be more able to execute two tasks or actions at the same time and equally well; bounce back from failure; have the "natural" ability with regards to certain skills such as "ball sense"; have a strong team spirit; get to a state where they are "flowing" freely (things just happen spontaneously); and have the ability to succeed as shown in their family history.

The study's findings suggested that certain underlying emotional aspects were indicative of inclusion into the study's B-team (or school B-team start-up and all reserve players). These considered 'second best' performing players had more of the emotional intelligence attributes usually associated with better and peak performance such as (positive and happy) emotions contributing to motivation, confidence, and 'flow' (Jackson & Csikszentmihalyi, 1999; Kerr, 1997; Maslow cited in Hanin, 2000a; Moran, 2004; Walker et al., 2005). In light of this finding and in reviewing the participating school teams' performances during the season prior to the assessment, possible explanations could be provided through this study for non- or sub-level performance of the start-up A-team players. If the schools' A-teams were not performing well during the season (as in the case of one of the participating schools), a closer inspection of the

teams' structure compared to the study's division of players (ie A-team start-up players versus B-team start-up players and A- team and B-team reserve players) could be helpful. If it was further found that B-team players and reserve players tended to perform better during the season than, for instance, A-team start-up players consideration of these underlying attributes could serve as suggestions for future construction of 'better' performing rugby teams.

The importance of emotions and emotional intelligence affecting sport performance was indicated through various research studies (Brokensha & Muller, 2007; Hanin, 2000a; Hanin, 2000b; Kerr, 1997; Lazarus, 2000; Meyer & Zizzi, 2007; Perlini & Halverson, 2006; Robazza, 2006; Vallerand, 1983; Zizzi et al., 2003). At the schools participating in this study, emotional intelligence, however, did not seem to be significant in distinguishing between second best and best performance in rugby (as seen through team inclusion). Although no significant difference could be found between the study's two teams in terms of total emotional intelligence score, A-team players did present slightly lower scores than B-team players. A possible explanation for this could be that A-team rugby players experience more pressure and higher stress levels than B-team players. Stress and anxiety, when perceived as negative, may affect emotions negatively and result in poorer performance in sport (Moran, 2004; Weinberg & Gould, 2007). The B-team players indicated that they were in general happier than the A-team players and they tend to have more underlying emotional intelligence qualities. By training the A-team players to become more emotionally intelligent, their overall emotional intelligence scores could increase significantly and thus lead to managing emotions and coping with pressure, stress and anxiety in a better way ultimately resulting in increased rugby performance (Goleman, 2004a; Jarvis, 2006; Jones et al., 2005; Le Roux, 2006; Moran, 2004).

The study was able to determine certain, although limited, factors contributing to rugby performance which could potentially also be influential in game outcome. In this regard, one could consider emotionally 'un-intelligent' and ill-disciplined behaviour resulting in penalties or yellow or red cards and then ultimately to game losses. Discipline is not only an integral part of sport participation as prerequisite for taking personal responsibility, being achievement orientated, having the drive to persist and being dedicated but it also forms part of the intrapersonal domain of emotional intelligence competency in the shape of being emotionally

self-aware, obtaining emotional self-knowledge, having emotional self-control and being able to control impulses, as well as managing and tolerating stress (Batista-Foguet et al., 2008; Cashmore, 2002; Goleman, 2004a; Goleman, 2004b; Hanin, 2000a; Spencer et al., 2008; Srivastava et al., 2008).

Therefore, various techniques to cope with stress and deal with negative emotions were suggested by the literature with the aim of improving performance (Cashmore, 2002; Jarvis, 2006; Jones et al., 2005; Moran, 2004; Yukelson, 2006; Zaro, 2008). Furthermore, Weinberg and Gould (2007) postulated that having the right combination of emotions could assist athletes to deal with stress and to perform better in sport. The study would therefore support suggestions to consider the importance of emotions (and emotional intelligence) within school rugby as rugby players could be taught (or selected to have it when it already exists) to focus on awareness, expression, management and control of the various emotions experienced during participation in sport, by means of the effective channelling thereof to ensure optimal functioning of the individual rugby player and/or the team. Ineffective emotional control could lead to poor performance, ill-discipline or transgressions of the rules of the sport during an athlete's performance (for example during a competition) of which the outcome again may affect the emotions experienced in future (Jones et al., 2005; Robazza, 2006). Effective self-regulation and management of emotions should therefore be pursued which could be achieved through the application of the various components of emotional intelligence.

In the study, question B54 (ie "getting to a state where I am 'flowing' freely (or things just happen spontaneously") was part of the focus predictor. Through literature the state of 'flow' during participation in sport was also compared with spiritual experience (Jackson & Csikszentmihalyi, 1999). The study indicated this aspect to possibly being related to the spiritual aspect of sport performance (see Table 7.2). For the total group of participants in this study it was found that this question correlated significantly with the spiritual aspect (higher state). Literature supported spirituality being conceptualised as finding meaning and value (Parry et al., 2007), developing oneself (and one's purpose) by finding meaning (Robinson, 2007b), aspiring to excel and become whole (Aitken, 1992), and experiencing peak performance as meaningful and fulfilling (Privette & Bundrick cited in Krane & Williams, 2006) thereby indicating a specific

state one can be in. In concurrence with literature, this study also suggested spirituality in sport (rugby) to be conceptualised in terms of a state of being as by indication of some significant correlation between spiritual aspect (higher state) and spiritual aspect (purpose and meaning).

Table 7.2 Spearman's rho Correlation for question B54 and other spiritual aspects in the study (N=100)

Spiritual aspect related to sport performance	Statistic	B54	Spiritual aspect (higher state)	Spiritual aspect (purpose and meaning)
B54 - I get to a state where I am 'flowing' freely (things just happen spontaneously)	Correlation Coefficient	1,000	0,248[*]	0,168
	Sig. (2-tailed)	.	0,013	0,094
Spiritual aspect (higher state)	Correlation Coefficient	0,248[*]	1,000	0,277[**]
	Sig. (2-tailed)	0,013	.	0,005
Spiritual aspect (purpose and meaning)	Correlation Coefficient	0,168	0,277[**]	1,000
	Sig. (2-tailed)	0,094	0,005	.

** Correlation is significant at the 0,01 level (2-tailed). * Correlation is significant at the 0,05 level (2-tailed).

7.1.4   Limitations

The study did not consider environmental factors for example parental influence and the specific school's rugby culture contributing to sport (rugby) performance. Various researchers have shown that emotional intelligence is dependent of culture, education, parental influence, child rearing and family environment (Sacks et al., 2006; Shanwal & Kaur, 2008; Spencer et al., 2008; Srivastava et al., 2008). Emotions are experienced, expressed and managed differently across individualistic and collectivistic cultures (Gangopadhyay & Mandal, 2008). This concerns the development of the individual's self-concept in terms of being independent or dependent of others which might then influence the way emotions are managed (Gangopadhyay & Mandal, 2008). A study conducted by Shanwal (cited in Shanwal & Kaur, 2008) found correlations between attentive ability, better academic performance and large sized families which have also been found to be associated with higher levels of emotional intelligence. Sacks et al. (2006) again suggested that parental influence on children's participation in organized sport and valuing of the sport experience, do play an important role, especially when participation is encouraged by the

parents. Shanwal and Kaur (2008) stipulated that emotional intelligence skills could be learned and that child rearing and family environment play an important role in the development of emotional intelligence. They refer to a study conducted by Tiwari and Srivastava (cited in Shanwal & Kaur, 2008) amongst primary school children where it was found that perceived environmental quality of home and school positively relate to emotional intelligence.

According to Ravizza (cited in Vealey & Garner-Holman, 1998) effective assessment for research purposes should include information about the specific team and organisational dynamics for better understanding of the factors measured. This could have been achieved in this study through prior assessment of organisational factors and cultural context having a possible influence on specific behaviours and the performance of the participating rugby players (Gangopadhyay & Mandal, 2008; Vealey & Garner-Holman, 1998). The linking by the sample group of the emotional intelligence sub-scales of **independence** and **interpersonal relationship** may also be indicative of a more collectivistic cultural context at play within these particular schools' rugby environment (Gangopadhyay & Mandal, 2008). The use of the Independence sub-scale (which was probably developed for application to an individualistic culture) would therefore seem to have been inappropriate for application to a team sport or the South African sport context being more (inter)dependent and collectivistic respectively.

A further limitation to this study could be that the organisational (in this case the four participating schools) culture of rugby as a team sport and the specific dynamics and demands related to it were not fully taken into account. As it was indicated through literature that various environmental factors might play a significant role in contributing to emotional intelligence, the current study could therefore lack important additional information to be considered for explaining the findings in depth.

Privette and Bundrick (cited in Hanin, 2000a) distinguished between peak experience and peak performance by depicting them as the "positive extreme of feeling" versus the "positive extreme of performance" and further suggested that the two can function independently of one another with regards to sport behaviour (p. 149). In this study, peak experience might have been

measured rather than peak performance as individual subjective perceptions regarding rugby performance were obtained through self-reporting and not through demonstration of performance.

By using the quasi-experimental design, the researcher could not exercise control over the experimental situation in terms of all possible factors influencing the results and also not make use of random assignment (Dunn, 2010; Vogt, 2006). The researcher, however, did consider the two groups compared to one another to be equivalent as far as possible by ensuring that the sample groups were of the same geographical area (Pretoria, Gauteng), predominantly Afrikaans-medium schools, and rugby played at high school level (ie from the first and second rugby teams of the schools).

The researcher made an effort to measure emotional intelligence as close as possible to what is allowed in a previously standardised instrument in the form of a self-developed questionnaire. This instrument was specifically designed for the sport (rugby) environment. The researcher defined emotional intelligence as an ability, trait, skill and competency (see Chapter 3) and used a self-report method based on rugby players' own perception thereof to measure it. As mentioned previously, a limitation in this method used is that emotional intelligence is not demonstrated. The rugby players might have faked and presented themselves better during self-evaluation than what is actually true of them (Van Rooy & Viswesvaran, 2004). The self-report method, however, was advantageous in as far as it could control for researcher bias which could have been a disadvantage of utilising a demonstrative evaluation method. A further advantage to the Applied Psychology field of the self-reporting measurement technique, is that feedback can be provided to the participating schools and the rugby players concerning their specific thoughts and feelings on the factors that were assessed. This could also lead to improved self-awareness, identification of problems and subsequent interventions (Vealey & Garner-Holman, 1998). A suggestion could be made to standardise the current self-evaluation instrument for improvement and further application.

Apart from the mentioned measurement limitations in the study, the use of Logistic Regression analysis requires the explanatory variables not to be highly correlated with one another as this could cause problems with estimation. Multicollinearity testing did take place with all variables

related but not too strongly related to each other (r<0,75 with tolerance values above 0,10) and therefore accepted for inclusion in the analysis. The ideal situation of variables being strongly (and significantly) related to the dependent variable were obtained through Model 8 wherein six predictors were in combination in one of the models (r>0,40 with p<0,05). In Logistic Regression, the more explanatory variables used, the larger the sample size should be. In this study, a fairly small sample size was used and therefore the model combinations were limited in terms of factors. It could be suggested that a bigger sample group is used in future, in order to investigate the effect of a larger combination of influencing factors on sport (rugby) performance.

7.2   RECOMMENDATIONS

7.2.1   Factors contributing to rugby game outcomes

In Chapter 1, the researcher posed rugby game outcomes to be determined by penalties, yellow and/or red cards issued, and more specifically, as a result of negative (emotional) behaviour. He was therefore interested in investigating emotional intelligence as predictor of rugby performance, to serve as a preliminary means to address and eliminate negative emotional behaviour affecting the outcome of a rugby game. As it was not found in the study that emotional intelligence played a role in predicting rugby performance (in this case having a more successful rugby team), the suggestion is that further research could be conducted in specifically investigating the effect of negative emotional behaviour on the outcome of rugby games.

It was also stated that the outcome of a rugby game could depend on many other factors which may not be attributed to the players themselves such as external environmental factors, home field advantage, the referee and even the bounce of the 'egg-shaped' ball. It is also suggested that such factors, separately or in combination with other factors (eg negative emotional factors), be investigated in terms of their influence on the outcome of rugby games.

7.2.2 Spirituality in rugby

According to Udermann and Watson and Nesti (cited in Crust, 2008) trainers and sport psychology consultants called for more attention to the importance of spiritual factors in sport. To conceptualise and measure it properly due to the personal nature thereof seems to be problematic though (Crust, 2008). The researcher also found that conceptualisation and measurement (indicated by the reliability analysis results) of the spiritual aspects predictor was problematic, in as far as, participants seem to assign individualistic meaning to the concept, which resulted in the misunderstanding of what was intended in this study. The spirituality concept seems to be interlinked to many other concepts such as peak performance, motivation (meaning and purpose), flow (focus), external factors (luck), and unexplained phenomena in sport (which could lead to superstition) (Cashmore, 2002; Jackson & Csikszentmihalyi, 1999; Kimiecik & Jackson, 2002; Parry et al., 2007). The study, however, indicated the importance of the spirituality aspect to sport (rugby) performance, although only through the sub-divided smaller scales used to measure it. Further research on this phenomenon in sport, and especially in rugby, is proposed.

7.2.3 Summary of contribution

The main contribution of the current study to the Exercise and Sport Psychology field is that not only psychological factors contributing to rugby performance were considered but also demographical, physical, social, spiritual and emotional factors individually and in relation to each other. The findings highlighted the contribution of demographical and spiritual factors as well as the combination of certain psychological, social and spiritual factors in determining best performance in sport. Best rugby performance was regarded in terms of being the best performing player based on being included into the best team. As was stated in the introduction chapter, best performances may be commonly judged in terms of the winning of games and competitions, but the aim of this study was rather to investigate the underlying factors (and especially the role of emotional intelligence) in predicting rugby performance. The results could then be applied to the real life situation (ie the participating schools) by providing feedback and suggestions for establishing the ultimate best performing rugby teams.

The literature study revealed the inter-linkage between various factors influencing sport performance (Davies, 1989; Durand-Bush et al., 2006; Feltz & Chase, 1998; Jowett et al., 2005; Kerr, 1997; Kremer & Moran, 2008; Stratton et al., 2005; Weinberg & Gould, 2007; Walker et al., 2005). This study was able to provide through its models, information on how these factors simultaneously influence performance at the participating schools. In terms of demographical factors, for example, if a rugby player (compared to co-players at the same level of rugby measured in this study) were older and practised rugby for a longer period of time, he would have a better chance to be selected as an A-team start-up player and therefore considered for the best (performing) rugby team. In terms of psychological, social and spiritual factors, this would be the same for a rugby player who was more making use of mental imagery, finding more purpose and meaning in this sport, being more able to reach a higher spiritual state and having a more positive experience of coaching and his relationship with the coach/es. Although these conclusions could not be generalised, it could contribute to further research on aspects relating to rugby as a school sport.

7.2.4   Final conclusion

Leading up to the investigation of emotional intelligence as predictor of rugby performance, the researcher asked himself whether teams being able to effectively manage their emotions (indicated through higher levels of emotional intelligence) would be more disciplined, commit less transgressions due to the lack of emotional control and therefore ultimately perform better. Although the study was not able to answer this question, it did find that B-team rugby players and reserve rugby players at the participating schools seemed to have higher levels of emotional intelligence qualities. One would therefore need to confirm with the participating schools whether more transgressions were committed during that particular rugby season due to lack of emotional control by start-up A-team rugby players than B-team and reserve rugby players. One could also review the performances of the participating schools' particular A-team and B-team during that year (bearing in mind the division made in terms of the study's two groups), to determine if the teams differed on the total transgressions committed due to emotional intelligence factors playing a role therein.

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SELF-EVALUATION QUESTIONNAIRE

OF

SPORT AND SPORT PERFORMANCE

IN TEAM SPORTS (RUGBY)

INSTRUCTIONS

Completion of the questionnaire should take no longer than approximately 60 MINUTES since

- you only have to **complete data into the blocks** provided in **Section A** (demographic information)

- you only have to **mark** the appropriate number with a **cross (X), tick (√) or circle (O)** in **Sections A** (Question 19-22), **B and C** (aspects related to sport performance) as questions/statements have already been structured in order for you to do so

- you **need not think too long** about the answers in **Sections B and C** as the first thing that comes to mind is usually the most appropriate

- there is **no right or wrong** answers – the **answer** that is the **most appropriate** to you is sufficient

Your answers will be treated as **strictly confidential** and will not be made available as raw data.

Your **personal identity** will not be linked to the answers given and therefore will be **protected**.

NB!!!

PLEASE READ THE INFORMED CONSENT FORM AND SIGN IT AT THE BOTTOM

Please follow the steps accurately in order to minimize the time taken to complete the questionnaire.

STEP 1:   **COMPLETION OF SECTION A:**

Section A consists of demographic data required from you. Please complete all fields as accurately and honestly as possible as at present moment. In the first table you have to **fill in the correct information**.

EXAMPLE:

Demographic	Answer
Current Age in Years	25

In the second table you have to mark (**X/√/O**) the correct answer Yes (Column A) or No (Column B), whichever is appropriate to you most of the time. **Only one answer may be selected per question**.

EXAMPLE:

Question	A	B
Are you most of the time a startup player?	**X**	No
Are you most of the time a reserve player?	Yes	**X**

STEP 2:   **COMPLETION OF SECTION B:**

In **Section B** you must indicate (mark with **X/√/O**) the **level to which you agree** to the different **sports related aspects** as they apply to you in your **sport performance**. These sports related aspects refer to physical, psychological, social and spiritual aspects important to you in your sport. Sport performance means the performance needed in order for you to do your best eg win a match.

Use the following five-point scale to indicate **your agreement** to the relevant **statements** where '1' denotes 'Strongly disagree' and '5' denotes 'Strongly agree':

	LEVEL OF AGREEMENT					
Strongly disagree	1	2	3	4	5	Strongly agree

EXAMPLE: I am performing at my best (for example: win a match) when …
I have been practicing a lot.

	LEVEL OF AGREEMENT					
Strongly disagree	1	2	3	**X**	5	Strongly agree

STEP 3:   **COMPLETION OF SECTION C:**

In **Section C** you must indicate (mark with **X/√/O**) the **level to which you agree** on the **emotional aspects related to sport** as they apply to you in your **sport performance**. Emotional aspects include being aware of and managing emotions/feelings as well as dealing with stress, adaptability and general mood. Sport performance means the performance needed in order for you to do your best eg win a match.

Use the following five-point scale to indicate **your agreement** to the relevant **statements** where '1' denotes 'Strongly disagree' and '5' denotes 'Strongly agree':

	LEVEL OF AGREEMENT					
Strongly disagree	1	2	3	4	5	Strongly agree

EXAMPLE: I am performing at my best (for example: win a match) when …
I feel good about myself.

	LEVEL OF AGREEMENT					
Strongly disagree	1	**X**	3	4	5	Strongly agree

SECTION A: DEMOGRAPHIC INFORMATION

PLEASE PROVIDE ALL DEMOGRAPHIC DATA AS ACCURATELY AS POSSIBLE

Serial No	Demographic Data	Answer
1	Current age in years	
2	Current average weight in kilograms	
3	Current length in centimetres	
4	Heart rate (pulse) **before** 100m sprint in beats per minute	
5	Heart rate (pulse) **after** 100m sprint in beats per minute	
6	Time for 100m sprint in seconds	
7	Maximum weight lifted during bench press in kilograms	
8	Average time practice per week in hours and minutes	
9	Participation in rugby in years (total amount of years including current year)	
10	Participation in sport in general in years (total amount of years including current year)	
11	Current position playing for the team (**in words**: eg scrumhalf)	
12	Jersey number allocated most of the time (**number**: eg 9)	
13	Highest school education level achieved (eg **grade** passed)	
14	Average total mark or symbol for highest school education level achieved	
15	Name of school where highest school education level was achieved	
16	City/town of school where highest school education level was achieved	
17	Province of school where highest school education level was achieved	
18	Highest after school or other outside of school education level achieved (eg course/ degree/ diploma/ certificate, etc) – specify **none** if no other qualification	

Serial No	Question	A	B
19	Are you currently selected for the 1st / A-team?	Yes	No
20	Are you currently selected for the 2nd / B-team?	Yes	No
21	Are you most of the time a start-up player?	Yes	No
22	Are you most of the time a reserve player?	Yes	No

SECTION B: PHYSICAL, PSYCHOLOGICAL, SOCIAL AND SPIRITUAL ASPECTS RELATED TO SPORT PERFORMANCE

*PLEASE RATE THE IMPORTANCE OF ALL STATEMENTS IN THE TABLE BELOW AS IT APPLIES TO YOUR CURRENT SITUATION BY **MARKING (X/√/O)** THE RELEVANT NUMBER ACCORDING TO A FIVE-POINT SCALE, WHERE **'1' DENOTES 'STRONGLY DISAGREE' AND '5' DENOTES 'STRONGLY AGREE'**. PLEASE ENSURE THAT YOU RATE ALL STATEMENTS.*

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
1	I am motivated by expecting a positive outcome	1	2	3	4	5
2	I purposely put in an effort to focus	1	2	3	4	5
3	I am self-confident and believe in myself	1	2	3	4	5
4	Our group or team performs as a unit	1	2	3	4	5
5	I am fit	1	2	3	4	5
6	I have faith in a higher Being or Beings	1	2	3	4	5
7	I create positive outcomes in my mind	1	2	3	4	5
8	The relationship between me and the coach is healthy and effective	1	2	3	4	5
9	I try to satisfy my own needs	1	2	3	4	5
10	I "zoom in" while ignoring distractions	1	2	3	4	5
11	I physically look good to myself	1	2	3	4	5
12	The coach has good leadership abilities	1	2	3	4	5
13	I am serious about my religious beliefs	1	2	3	4	5
14	I identify strongly with "our team" as opposed to the "other team" (opponents)	1	2	3	4	5
15	I have a positive attitude	1	2	3	4	5
16	I have the ability to execute two tasks or actions at the same time and equally well	1	2	3	4	5
17	I am determined to persist even when it seems difficult	1	2	3	4	5
18	I am determined to succeed	1	2	3	4	5
19	I have the ability to succeed as shown in my family history (eg older family member success)	1	2	3	4	5
20	I have a lucky charm	1	2	3	4	5

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
21	Strong shared (mutual) interaction and communication exist within our group	1	2	3	4	5
22	I have been historically successful in my life as an athlete (past successes)	1	2	3	4	5
23	I belief in my own ability to succeed	1	2	3	4	5
24	I visualize my achievement and success during training/rehearsal before the game	1	2	3	4	5
25	I have stamina	1	2	3	4	5
26	I do not get stuck on negative images with regards to past failures and/or mistakes	1	2	3	4	5
27	I approve of the coach's coaching style	1	2	3	4	5
28	I am able to show leadership towards other members of the team	1	2	3	4	5
29	I have the mental toughness and hardiness to perform well	1	2	3	4	5
30	I am physically strong	1	2	3	4	5
31	I have faith in the supernatural, non-material or non-physical	1	2	3	4	5
32	I concentrate very intensely and become totally absorbed in the specific sport task	1	2	3	4	5
33	I try to satisfy the team's needs	1	2	3	4	5
34	I show the spectators that I can do it	1	2	3	4	5
35	As players we are dependent on one another within the team	1	2	3	4	5
36	I perform with a goal in mind which I have set for myself	1	2	3	4	5
37	The coach communicates effectively to me	1	2	3	4	5
38	I am in good health.	1	2	3	4	5
39	I am able to cope with pressure	1	2	3	4	5
40	I make use of cue-words to help me concentrate	1	2	3	4	5
41	The mascot makes it happen	1	2	3	4	5
42	I physically look good to others	1	2	3	4	5
43	I am able to control all situations during the game	1	2	3	4	5
44	I satisfy internal desires and needs to do well	1	2	3	4	5
45	I make use of routines to help me concentrate	1	2	3	4	5
46	Our team has put in place common/shared group goals and norms (rules of standards)	1	2	3	4	5
47	I am able to perform well under pressure	1	2	3	4	5
48	I find purpose and meaning in life through my sport performance	1	2	3	4	5

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
49	I complete the task to achieve my own set standard of performance	1	2	3	4	5
50	Before the game I create a mental picture of what I am going to do	1	2	3	4	5
51	I have been born with sporting abilities (it is in my genes)	1	2	3	4	5
52	I am empowered to perform by my coach	1	2	3	4	5
53	We have a strong team spirit	1	2	3	4	5
54	I get to a state where I am "flowing" freely (things just happen spontaneously)	1	2	3	4	5
55	I have the ability to concentrate or direct my attention without being distracted	1	2	3	4	5
56	I perform in order to get an award	1	2	3	4	5
57	I have the "natural" ability with regards to certain skills such as "ball sense"	1	2	3	4	5
58	I can bounce back from failure	1	2	3	4	5
59	My goal is to win the game	1	2	3	4	5
60	Coaching takes place within an acceptable climate of learning	1	2	3	4	5
61	I have "natural" abilities with regards to skills such as speed, strength and/or flexibility	1	2	3	4	5
62	I go beyond myself to a higher state or place of being while on the field	1	2	3	4	5

NB: ASSESS ITEMS IN TERMS OF YOUR PRESENT SITUATION

SECTION C: EMOTIONAL ASPECTS RELATED TO SPORT PERFORMANCE

*PLEASE RATE THE IMPORTANCE OF ALL STATEMENTS IN THE TABLE BELOW AS IT APPLIES TO YOUR CURRENT SITUATION BY **MARKING (X/√/O)** THE RELEVANT NUMBER ACCORDING TO A FIVE-POINT SCALE, WHERE **'1' DENOTES 'STRONGLY DISAGREE'** AND **'5' DENOTES 'STRONGLY AGREE'**. PLEASE ENSURE THAT YOU RATE ALL STATEMENTS.*

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
1	In general I have strong feelings of self-worth, self-esteem and self-respect	1	2	3	4	5
2	I am aware of my own feelings when I perform in my sport	1	2	3	4	5
3	I use feelings experienced during a game to the betterment of my own performance	1	2	3	4	5
4	I can freely experience my own emotions during a game	1	2	3	4	5

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
5	When I perform at my best I lose all sense of myself and find myself in the flow of the event	1	2	3	4	5
6	In general, I understand how other team members feel, because I feel the same	1	2	3	4	5
7	I generally have feelings of responsibility towards my team	1	2	3	4	5
8	I find it easy to communicate my feelings to others by talking about it	1	2	3	4	5
9	I find it easy to relax when I experience stress **before** a game	1	2	3	4	5
10	I am optimistic about the outcome of my actions during a game	1	2	3	4	5
11	I see myself as others see me	1	2	3	4	5
12	It is easy for me to adapt to changes experienced in the game	1	2	3	4	5
13	I am optimistic about the end result of the game	1	2	3	4	5
14	I recognize (become aware of) my true feelings	1	2	3	4	5
15	I value myself very highly	1	2	3	4	5
16	The feelings I experience during the game are used by me to the advantage of the team	1	2	3	4	5
17	I can freely express how I feel during a game	1	2	3	4	5
18	I can easily recognize feelings in other players	1	2	3	4	5
19	I can tolerate a lot of emotional stress without acting out against it	1	2	3	4	5
20	I can easily pick up what others are feeling via their body language	1	2	3	4	5
21	I feel I am only responsible for doing **my** part within the team	1	2	3	4	5
22	I find it easy to relax when I experience stress **during** a game	1	2	3	4	5
23	I am happy to delay immediate satisfaction of my needs during a game	1	2	3	4	5
24	I find solutions to problems about not performing well	1	2	3	4	5
25	I have happy feelings such as contentment, enthusiasm, satisfaction and joy	1	2	3	4	5
26	I test my own feelings about myself with others to see if my feelings are realistic	1	2	3	4	5
27	I can easily find solutions to problems (eg strong opponents, unfair referee, own and teammate mistakes) experienced during the game	1	2	3	4	5
28	I expect that we **will** win the game	1	2	3	4	5
29	I cooperate with my teammates when they expect something new from me	1	2	3	4	5
30	I can control my emotions without acting out, when something negative happens to **me** during a game	1	2	3	4	5

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
31	Communicating my feelings to others is very important to me	1	2	3	4	5
32	I can control my emotions without acting out, when something negative happens to **the team** during a game	1	2	3	4	5
33	I can express my feelings in such a way as to help me do my best	1	2	3	4	5
34	In general, I can deal with my feelings regardless of others or external circumstances	1	2	3	4	5
35	I understand the emotions experienced by other players during a game	1	2	3	4	5
36	I can handle stress well	1	2	3	4	5
37	I can describe the feelings I experience during my performance well	1	2	3	4	5
38	I use feelings in such a way as to be able to improve my performance	1	2	3	4	5
39	I have strong feelings of trust in myself	1	2	3	4	5
40	I have feelings of pride or dignity about myself	1	2	3	4	5
41	I have ways of dealing with stress in a positive way	1	2	3	4	5
42	I feel good about my relationship with the coach	1	2	3	4	5
43	I control impulses now because I know I will get the satisfaction later on	1	2	3	4	5
44	I have intense feelings of well-being and happiness	1	2	3	4	5
45	I have realistic feelings about myself	1	2	3	4	5
46	I use my emotions to achieve my highest potential in my sport	1	2	3	4	5
47	I have feelings of responsibility towards the coach	1	2	3	4	5
48	I generally have feelings of trust for other members of the team	1	2	3	4	5
49	I can identify the way others feel by looking at my own feelings	1	2	3	4	5
50	I know and understand the reasons why I experience the feelings I have	1	2	3	4	5
51	I need others to help me deal with feelings I experience during my performance	1	2	3	4	5
52	Others consider me to have a high value of myself	1	2	3	4	5
53	I find it easy to adapt to stressful situations	1	2	3	4	5
54	It is important for me to get satisfaction now rather than later	1	2	3	4	5
55	I am very keen to gain the most out of the feelings that I experience during a game	1	2	3	4	5
56	I feel I have a responsibility towards the spectators of the game	1	2	3	4	5
57	I am happy to adapt to changes in a game	1	2	3	4	5

Serial No	I am performing at my best (for example: win a match) when …	Level of agreement				
58	I know how my feelings affect my performance	1	2	3	4	5
59	I feel good about my relationship with other team members	1	2	3	4	5
60	I perform well under stressful circumstances	1	2	3	4	5
61	I am in a happy mood most of the time during a game	1	2	3	4	5
62	I consider emotions to play an important role in reaching my ultimate potential	1	2	3	4	5
63	I can freely **experience** my own feelings during my performance regardless of the influence of the coach or teammates	1	2	3	4	5
64	It is important for me to solve a problem (for example strong opponents, unfair referee, own and teammate mistakes) experienced during a game	1	2	3	4	5
65	I am hopeful and positive about the end result of future games even when we loose a game	1	2	3	4	5
66	The feelings I experience are similar to that of other sports persons	1	2	3	4	5
67	I feel good about new instructions by the coach	1	2	3	4	5
68	I am able to solve problems (for example strong opponents, unfair referee, own and teammate mistakes) experienced during the game	1	2	3	4	5
69	I am happy about my performance in general	1	2	3	4	5
70	I am optimistic about the game, my teammates and coach	1	2	3	4	5
71	I can freely **express** my own feelings during my performance regardless of the influence of the coach or teammates	1	2	3	4	5
72	I feel I am responsible for the combined effort of the team (not as captain of the team, but as co-player)	1	2	3	4	5

THANK YOU

FOR TAKING THE TIME TO COMPLETE

THIS QUESTIONNAIRE

ALL THE BEST WITH YOUR

FUTURE SPORT PERFORMANCES

COACH QUESTIONNAIRE

A.   **As a coach at our specific school, the following aspects are considered important when selecting a member for the team and rated in order of importance**:

List of aspects:	**Order of importance**:
	(1-10)

1.   _____   _____
2.   _____   _____
3.   _____   _____
4.   _____   _____
5.   _____   _____
6.   _____   _____
7.   _____   _____
8.   _____   _____
9.   _____   _____
10. _____   _____

B.   **Please indicate the aspects that you would consider important to distinguish between a member from the A-team and a member from the B-team, and rate them then in order of importance:**

List of aspects:	**Order of importance**:
	(1-10)

1.   _____   _____
2.   _____   _____
3.   _____   _____
4.   _____   _____
5.   _____   _____
6.   _____   _____
7.   _____   _____
8.   _____   _____
9.   _____   _____
10. _____   _____

C. Please indicate (*with a X/√/O*) to what extent you agree that the following aspects are important for a player to perform at his best:

1. **Mental toughness** (*ability to perform under pressure, bounce back from failure*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

2. **Motivation** (*determined to succeed, motivated by internal desires/external rewards*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

3. **Focus** (*concentrate, direct attention without being distracted*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

4. **Personal attributes** (*self-confidence, leadership, setting of goals*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

5. **Mental imagery** (*visualize, mental picture*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

6. **Coaching & coach-athlete relationship** (*style, ability, communication, climate*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

7. **Team cohesion** (*"team spirit", interaction, inter-communication, sharing goals*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

8. **Talent and physical attributes** (*history, genetics, skills, speed, fitness, strength, etc*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

9. **Spiritual aspects** (*faith, religion, higher state, meaning in life*)

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

10. **Emotional intelligence** (*emotional awareness, regulation, control, management*):

Strongly Agree	Agree	Maybe/Neutral	Disagree	Strongly Disagree	Do not consider it at all
1	2	3	4	5	6

D. **Please indicate any other aspects/comments that you would like to mention when considering best performance**.

_____

_____

_____

_____

INFORMED CONSENT INFORMATION

This form has been developed for your protection. Please read the following information with regard to your participation in this study. After you have read through it, please sign and submit the form indicating your willingness to participate. Thank you!

ASSESSING SPORT AND SPORT PERFORMANCE IN TEAM SPORTS (RUGBY)

I am Daniël Knobel, a Masters Degree student in Research Consultation (Psychology) at the University of South Africa (UNISA). I am conducting a study on sport and sport performance. Specifically, I am interested in identifying the most appropriate predictors of sport and sport performance by investigating certain physical, psychological, social, spiritual and emotional factors within rugby as a team sport in the South African context. I would appreciate your participation in this study as it will assist me in understanding and contributing to academic knowledge information obtained on the factors involved and influencing players' performance.

RESEARCH PROCEDURES AND SAFEGUARDS

A questionnaire was designed to measure the factors influencing rugby-player performance by obtaining data thereon through self-evaluation. The questionnaire was designed not to require respondents to provide their names. Your name provided through this consent form, ensures that ethical/legal procedures are followed by me, again ensuring your protection and therefore it will not be incorporated with the data obtained from the questionnaire. By completing the questionnaire you will not be facing any significant risk. The only foreseeable risks involve are the revealing of personal information to a limited extent and expression of personal opinion. The handling of such information obtained would be strictly confidential with the understanding that in no way would it be possible to connect published findings to personal identity or name. Only people directly involved in this study will have access to this information. The aim of the study is to present information to the knowledge community (such as the Universities of Pretoria sport

bureau and psychology departments of respectively the Universities of Pretoria and South Africa) in order to make a contribution to the development of sport and (specifically) rugby at this level.

Certain questions may confuse you somewhat but important for you to know is that there is no (necessarily) right or wrong answer to each of the questions asked. You should, however, attempt to provide your most honest response to each item in the questionnaire. Information will be further processed via coding and computation procedures ensuring results to be even more impersonal. It may be decided to present the final document with findings to others, or publish results in scientific journals or at scientific conferences. When this happens, your personal identity name will still remain unassociated with any of the data collected as strictly confidential.

Lastly, you will be helping to collect evidence identifying the best predictors of sport performance in assistance of furthering knowledge about rugby-players and rugby as a sport in South Africa. This evidence could potentially be used to identify the relationships between emotions and health, workplace performance, and sport/exercise participation.

FREEDOM TO WITHDRAW

Your participation in this research study is completely voluntary, and you may withdraw from it at any time and for any reason without penalty. There are no consequences of withdrawing from the study. Should you withdraw or be withdrawn from the study, any information obtained from you will be destroyed and not used with regards to the study. Participation or non-participation will in no way impact your involvement in sport or team status.

ENQUIRIES

Once the study is completed, I would be glad to make the results available to you, should you require so. For any enquiries, feel free to contact me at:

Mr D.P. Knobel
Centre for Applied Psychology (UCAP), PO Box 392, UNISA, Pretoria,
0003
Tel: 012-4298299/0845218712 or e-mail: knobedp@unisa.ac.za

You may also contact my supervisor at:

Dr I. Ferns

Department of Psychology, PO Box 392, UNISA, Pretoria, 0003

Tel: 012-4298210 or e-mail: fernsi@unisa.ac.za

CONSENT

Through this letter an explanation of this study has been provided to me and I understand it. I therefore agree to participate in this study and understand that my participation is voluntary.

_____   _____

Signature: Participant   **Signature: Parent/Legal Guardian**

_____   _____

Name: Participant   **Name: Parent/Legal Guardian**

(Printed)   **(Printed)**

_____   _____

Date   **Date**

This research study has been approved by the University of South Africa's Review Board by acceptance of a research proposal in order to submit a Master's degree research thesis.