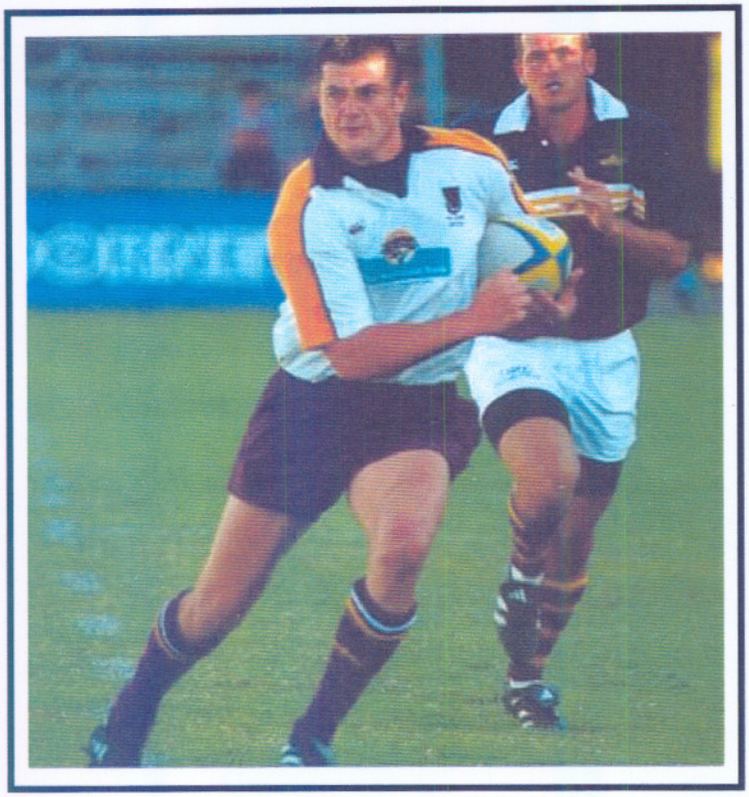
Sport psychological skills that distinguish between u/19 club rugby players of different participation levels and positional groups



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DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE M.SC. DEGREE IN THE SCHOOL OF BIOKINETICS, RECREATION AND SPORT SCIENCE IN THE FACULTY OF HEALTH SCIENCES AT THE NORTH-WEST UNIVERSITY (POTCHEFSTROOM CAMPUS)

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Potchefstroom

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Foreword

I would like to express my sincere appreciation to the following people:

- ☺ My supervisor, Mr. Heinrich Grobbelaar, who has guided me very patiently through my masters' study. Thank you for your dedication and contribution.
- ☺ My co-supervisor, Dr. Johan Potgieter, for his input and participation in my research.
- ☺ To Prof. Faan Steyn who guided me with the statistical data.
- ☺ The u/19 coaching panel from the PUK Rugby Institute who identified and ranked the rugby players.
- ☺ To all of the u/19 rugby players who were involved.
- ☺ To my family, especially my parents, Keith and Louise, whose interest and support assisted me during this time.
- ☺ To Ms. E. Uren and Ms. C. Van Der Walt for the language editing.

Declaration

The co-authors of the two articles, which form part of this dissertation, Mr. Heinrich Grobbelaar (supervisor) and Dr. Johan Potgieter (co-supervisor), hereby give permission to the candidate, Miss. Michelle Andrew to include the two articles as part of a Masters dissertation. The contribution (advisory and supportive) of these two co-authors was kept within reasonable limits, thereby enabling the candidate to submit this dissertation for examination purposes. This dissertation, therefore, serves as partial fulfilment of the requirements for the M.Sc. degree in Sport Science within the School of Biokinetics, Recreation and Sport Science in the Faculty of Health Sciences at the North-West University (Pothefstroom campus).

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Supervisor and co-author

Dr. Johan Potgieter
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Summary

The sport psychological skills that distinguish between u/19 club rugby players of different participation levels and positional groups

Sport psychological skills play an important role in sport performance. Evidence further suggests that the psychological skill levels may be influenced by the particular playing position. One hundred and eighty u/19 rugby players from the PUK Rugby Institute (average age: 18.79 ± 0.28 years) were tested during the 2003-2005 rugby seasons by means of the Competitive State Anxiety Inventory-2 (CSAI-2), Psychological Skills Inventory (PSI), Athletic Coping Skills Inventory-28 (ACSI-28), as well as a questionnaire dealing with psychosocial factors influencing participation and performance in rugby. Players from the 2004 and 2005 seasons (n=120) were first divided into two groups (top- and lower ranked players) of 60 players each. Effect size results (practical significance) revealed moderately significant differences between the two groups, with the top ranked players outscoring their lower ranked counterparts in self-confidence, general coping resources, coping with adversity, average psychological skills score, as well as the effect of team members/team spirit, coaches and financial aspects on participation and performance. These results confirm that sport psychological skill levels and related psychosocial factors can distinguish between rugby union players of different participation levels. Secondly, the total subject group (n=180) was divided into seven positional groups (props, hookers, locks, loose trio, half-backs, centres and back three). These groups were compared by means of effect sizes (practical significance) for each of seven sport psychological skills as measured with the PSI. Moderate (46) and large (20) practically significant differences were reported for the 147 inter-positional comparisons. The results show that the half-backs and hookers consistently outperformed the other three positional groups, while the props, locks and back three often showed the lowest skill levels. While these results are discussed in reference to practical implications for future position specific sport psychological skills training sessions, they clearly show that sport psychological skill levels differ from one position to another.

Key words: Sport psychological skills, rugby union players, playing positions, performance levels.

Opsomming

Die sportpsigologiese vaardighede wat onderskei tussen o/19 klubrugbyspelers van verskillende deelnamevlakke en posisionele groepe

Sportpsigologiese vaardighede speel 'n belangrike rol in sportprestasie. Bewyse dui verder aan dat psigologiese vaardigheidsvlakke sekere spelposisies beïnvloed. Honderd en tagtig o/19 rugbyspelers van die PUK Rugby Instituut (gemiddelde ouderdom: 18.79 ± 0.28 jaar) is getoets tydens die 2003-2005 seisoene, met die Kompetisieangs Intervaris-2 (KAI-2), Sielkundige Vaardighede Inventaris (SVI), Sport Coping Vaardighede Inventaris-28 (ACSI-28) sowel as die vraelys wat handel oor die psigososiale faktore wat deelname aan en prestasie in rugby beïnvloed. Spelers van die 2004 en 2005 seisoene (n=120) is verdeel in twee groepe (top- en laer spelers) van 60 spelers elk. Effekgrootte-resultate (praktiese betekenisvolheid) het matig betekenisvolle verskille tussen die twee groepe gevind, met die topspelers wat beter toets as die laer spelers ten opsigte van selfvertroue, algemene psigologiese vaardighede, afwesigheid van bekommernis, gemiddelde psigologiese vaardighede, sowel as wat die effek is van die spanlede/spangees, afrigters en finansiële aspekte op deelname en prestasie. Die resultate bevestig dat sportpsigologiese vaardigheidsvlakke en verbandhoudende psigososiale faktore tussen rugby-unie-spelers van verskillende deelnamevlakke kan onderskei. Die tweede doel van die studie was om 180 rugbyspelers in verskillende posisionele groepe (sewe groepe: stutte, hakers, slotte, los trio, skakels (skrumskakel en losskakel), senters en agterste drie) met mekaar te vergelyk ten opsigte van hul sportpsigologiese vaardigheidsvlakke en verbandhoudende psigososiale faktore. Die groepe is vergelyk ten opsigte van effekgroottes (praktiese betekenisvolheid) vir elk van die sewe sportpsigologiese vaardighede wat gemeet is met die Sielkundigevaardighede-inventaris (SVI) vraelys. Matige (46) en groot (20) prakties betekenisvolle verskille is gerapporteer vir 147 van die interposisionele vergelykings. Die resultate wys dat die skakels en hakers deurgaans beter as die ander drie groepe presteer het, terwyl die stutte, slotte en agterste drie die laagste vaardigheidsvlakke getoon het. Namate die resultate bespreek word met verwysing na die praktiese implikasies vir toekomstige posisie-spesifieke sportpsigologiese vaardigheidsoefeningsessies, word dit duidelik dat sportpsigologiese vaardigheidsvlakke van posisie tot posisie verskil.

Sleutelterme: Sportpsigologiese vaardighede, rugby-unie-spelers, spelposisies, prestasievlakke.

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List of Abbreviations

PRI	PUK Rugby Institute
CSAI-2	Competitive State Anxiety Inventory-2
ACSI-28	Athletic Coping Skills Inventory-28
PSI	Psychological Skills Inventory
SPSTP	Sport Psychological Skills Training Programmes
PST	Sport Psychological Skills Training
ES / d	Effect Size
SD / s	Standard deviation
N	Number of subjects in total group
n	Number of subjects in each subgroup
M	Mean
Sp	Pooled standard deviation
IZOF	Individual Zone of Optimal Functioning
TAIS	Test of Attentional and Interpersonal Styles

1 Problem Statement, Objectives And Hypotheses

1.1 PROBLEM STATEMENT

The International Rugby Board repealed the rules on amateurism after the 1995 Rugby World Cup and because of this, rugby became a professional sport (Treasure *et al.*, 2000:571). Shortly after the 1995 World Cup tournament, Cox and Yoo (1995:189) stated that success in the professional rugby setting is not only dependent on the physical and tactical aspects but that psychological skills also need to be addressed. As a result of professionalism a similar demand was placed on the rugby players' psychological skill levels, as has been the case in other professional sporting codes (Garraway *et al.*, 2000:348). The identification and development of psychological skills have subsequently become of great interest to players, coaches and administrators, due to the relationship that exists between these type of skills and the development as well as performance of the modern rugby player (Golby & Sheard, 2004:934).

From the above-mentioned statements it is clear that the rugby players' performance is not only dependent on physical, physiological, tactical and positional skills, but also on sport psychological skills. Le Roux and Pienaar (2001:188) as well as Lyons (2001:1) noted that sport psychology plays an important and ever-increasing role in the world of competitive sport. The importance of sport psychology is further highlighted by the contention that the knowledge obtained by the study of sport psychology (focusing on the behaviour of athletes within the sporting context) could be used to explain, predict and change behaviour in order to enhance performance (Potgieter, 2003:1). These results also suggest that there may be a definite advantage to incorporating the services of a sport psychologist in the preparation of a rugby team.

It is within this introduction that a brief literature review of the sport psychological skills of rugby players follows. There are, however, limited research findings regarding the psychological skills of rugby players, especially within the South African context.

A recent study conducted by Kruger (2003) attempted to rectify the shortage of information on the sport psychological skills of South African rugby players. The results showed that 67.5% of a group consisting of 108 South African Super 12 rugby players regarded sport psychology as an important performance determinant (Kruger, 2003:21). Similar results were previously published by Ferraro and Rush (2000:1) who reported that the majority of professional and amateur athletes were of the opinion that they could benefit from sport psychology services. There are, however, justifiably those athletes who feel that they can deal with their own emotions without any outside help (Meyers *et al.*, 1995:4). In spite of the perceived importance that the South African Super 12 rugby players hold with regard to sport psychological preparation, only 29.6% of them categorised their psychological preparation for competitions as being very good (Kruger, 2003:21). In the last-mentioned study, 57.4% of players categorised their sport psychological preparation as being above-average (well-prepared), while 13.0% reported average psychological preparation and readiness for matches. The findings of Kruger (2003:22) further showed that only 2.8% of the players consulted a sport psychologist at the time of testing, 18.5% the of the players would consult a sport psychologist if they knew where to obtain this service, 38.0% of players were uncertain about what sport psychological services entail, 33.3% of the players indicated they would consult a sport psychologist if their services were made available and 7.4% of the players deemed these services unnecessary. Based on these results, it is clear that players need to spend more time and give more attention to their psychological preparation for matches.

The lack of knowledge regarding sport psychological services and the use thereof supports the opinion held by Gould *et al.* (1999:128) that the introduction to sport psychological skills training at the junior and sub-elite levels of sport is the primary responsibility of coaches. Within the South African context, however, 84% of teachers who coach sport at the secondary school level have not received any training in sport psychology (Le Roux & Pienaar, 2001:207). Various researchers (Savoy, 1997; Smith & Smoll, 1997; Gould *et al.*, 1999; Fourie & Potgieter, 2001; Le Roux & Pienaar, 2001) have previously described the inability and lack of experience regarding the development and implementation of sport psychological skill programmes by coaches as a major problem within the sporting environment. From the last-mentioned findings and the possible advantages that sport psychological skills development can have, it is clear that a lack of knowledge

concerning sport psychology can pose a real threat to the development and possible performance of athletes.

It is likely that the dismal performance of the South African teams during the 2003 Super 12 tournament was, among other factors, caused by a lack of psychological preparation and abilities concerning this aspect. The observation that the highest placed South African team in this tournament scored significantly higher ($p<0.05$) for goal setting/mental preparation, concentration, confidence and achievement motivation than the other three South African teams (Kruger, 2003:35), may also be an indication that the last-mentioned notion is indeed correct. Similar results were also obtained by Golby and Sheard (2004:939) who found significantly higher ($p<0.05$) levels of attentional control (concentration) among English international rugby league players compared to division one players. The results of these studies are not in agreement with that of Maynard and Howe (1989:288) who found no difference between attention levels (players from different participation levels), although older players did show better attentional control than younger players. Furthermore, self-confidence is the one mental skill often regarded as a primary requisite for optimal performances (Hodge & McKenzie, 2002:47; MacLean & Sullivan, 2003:1). In this regard, Hodge and McKenzie (2002:48) found lower levels of self-confidence among less successful rugby players, causing a fear of failure, extreme tenseness, lack of concentration, tentative performances and conservative decision-making. Although scarce, information does indicate that certain sport psychological skills could distinguish between successful/less successful rugby players and/or between players from different participation levels.

Another important research area is the possible relationship between sport psychological skills and different playing positions (Cox & Yoo, 1995:189). Little research has been conducted on the sport psychological skill profile of different rugby positions. The available research does, however, report that halfbacks (scrumhalves and flyhalves) have significantly better ($p<0.05$) broad external focus skills than players of other playing positions (Maynard & Howe, 1989:287). Kruger (2005:46) did not find any positional differences regarding the sport psychological skills among 340 senior rugby players from different competitive levels. Among American Football players, Cox and Yoo (1995:191) found significantly better ($p<0.05$) anxiety control, concentration, motivation and confidence among backfield players than linesman regardless of playing position (offence/defence). Furthermore, offensive players showed significantly better ($p<0.01$) anxiety control than defensive players and offence backfield players have significantly higher ($p<0.05$) motivational levels than the offence linesman. Cox and Yoo (1995:191), however, pointed out that a player's position in a team should not be decided solely on his sport psychological skills profile, as various other factors such as physique, strength and speed also play an important role. The lack of research pertaining to

sport psychological skills which could potentially distinguish between players of different participation levels and the contradicting results regarding positional differences in the psychological skill levels of rugby players necessitates a study on this topic.

It is in light of the problem statement that the following research questions are posed: Firstly, what is the nature of u/19 club rugby players' prior exposure to sport psychological skills training programmes? Secondly, how important do u/19 club rugby players perceive sport psychological skills training programmes? Thirdly, to what extent do u/19 club rugby players express a need for psychological skills training programmes? Fourthly, what is the perceived ability of u/19 club rugby to be psychologically well prepared for competitions? Answers to the above four questions will be given in reference to how these factors distinguish between players of different participation levels. Fifthly, which sport psychological skills and related psychosocial factors distinguish between u/19 club rugby players of different participation levels? Lastly, do any positional differences exist regarding the sport psychological skill levels of u/19 club rugby players?

1.2 OBJECTIVES

The first set of objectives of this study are to determine whether u/19 club rugby players from different competitive levels can be distinguished based on their:

1. Prior exposure to sport psychological skills training programmes
2. Perceived importance of sport psychological skills training programmes
3. Perceived ability to be well prepared psychologically for competitions
4. Expressed need for sport psychological skills training programmes
5. Sport psychological skill levels and related psychosocial factors

Another objective of this study is to determine:

6. Whether or not any positional differences exist regarding the sport psychological skill levels of u/19 club rugby players.

1.3 HYPOTHESES

This study is based on the following hypotheses:

1. Prior exposure to sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels
2. Perceived importance of sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels

3. Perceived ability to be well prepared psychologically for competitions will distinguish between u/19 club rugby players of different participation levels
4. Expressed need for sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels
5. The sport psychological skill levels and related psychosocial factors will distinguish between u/19 club rugby players of different participation levels
6. Positional differences will exist regarding the sport psychological skill levels of u/19 club rugby players.

1.4 STRUCTURE OF THE DISSERTATION

This dissertation will be submitted in article format as approved by the Senate of the North-West University and is structured as follows:

- ✓ Chapter 1 consists of the problem statement, objectives of the study and the hypotheses thereof. A reference list is provided at the end of the chapter according to the prescription of the North-West University
- ✓ Chapter 2 is a research article entitled "Sport psychological skill levels and related psychosocial factors that distinguish between rugby union players of different participation levels". This article will be submitted for publication in the South African Journal for Research in Sport, Physical Education and Recreation. It is hereby included according to the specific guidelines of the journal which are presented in Appendix A (Information for authors)
- ✓ Chapter 3 is a research article entitled "Positional differences in the sport psychological skill levels of rugby union players". This article will be submitted for publication in The Sport Psychologist. It is hereby included according to the specific guidelines of the journal which are presented in Appendix B (Submission guidelines)
- ✓ Chapter 4 consists of a short summary, followed by conclusions drawn from this study, the recommendations and implications for further studies on this topic. A reference list is presented at the end of the chapter according to the prescription of the North-West University.

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2 Sport Psychological Skill Levels And Related Psychosocial Factors That Distinguish Between Rugby Union Players Of Different Participation Levels

This article will be submitted for publication in the South African Journal for Research in Sport, Physical Education and Recreation. It is hereby included according to the specific guidelines of the journal which are presented in Appendix A (Information for authors).

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SPORT PSYCHOLOGICAL SKILL LEVELS AND RELATED PSYCHOSOCIAL FACTORS THAT DISTINGUISH BETWEEN RUGBY UNION PLAYERS OF DIFFERENT PARTICIPATION LEVELS

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ABSTRACT

The purpose of this study was to compare 60 top ranked and 60 lower ranked u/19 rugby union players from the PUK Rugby Institute (average age: 18.78 ± 0.28 years). Results show slight differences regarding previous consultations with sport psychologists, perceived importance of and need for psychological skills training sessions and the players' perceived ability to be psychologically well prepared for competitions. Effect size results (indicating practical significance) show that the top ranked players perceive psychosocial factors such as team members/team spirit, coaches, and financial aspects as significantly more positive ($d \geq 0.4$) than the lower ranked players, while they are also significantly better ($d \geq 0.4$) at fitting in with new team members, settling in with coaches and adapting to change in general. The top ranked players also showed significantly greater self-confidence ($d \geq 0.4$), personal coping resources, coping with adversity, average psychological skills and activation control scores than their lower ranked counterparts, stressing the important role of sport psychological skills towards rugby performance. It can be concluded that sport psychological skill levels and related psychosocial factors can distinguish between rugby union players of different participation levels. Results are further discussed in reference to practical implications for future sport psychological skills training sessions.

Key words: Sport psychological skills; performance; rugby union.

INTRODUCTION

The International Rugby Board repealed the rules on amateurism after the 1995 Rugby World Cup and as a result rugby became a professional sport (Treasure *et al.*, 2000). Shortly after the 1995 World Cup tournament, Cox and Yoo (1995) stated that success in professional sport is not

only dependent on the physical and tactical aspects but that psychological skills also need to be addressed. As a result, Garraway *et al.* (2000) pointed out that similar demands were placed on the rugby players' psychological skill levels, as has been the case in other professional sporting codes. Le Roux and Pienaar (2001) as well as Lyons (2001) further noted that sport psychology plays an important and ever-increasing role in the world of competitive sport. The importance of sport psychology is emphasized by the contention that the knowledge obtained by the study of an athletes' behaviour within a sporting environment could be used to explain, predict and change behaviour (Potgieter, 2003). The identification and development of sport psychological skills have subsequently become of great interest to players, coaches, administrators and sport psychology researchers, due to the relationship that exists between these skills and the development as well as performance of the modern rugby player (Golby & Sheard, 2004).

A recent study by Kruger (2003) showed that 67.5% of South African Super 12 rugby players regard sport psychological skills as important performance determinants. Despite this contention, only 2.8% of these players individually consulted a sport psychologist, while only 29.6% perceived their own ability to be psychologically well prepared for competitions as very good. These results suggest a definite need for sport psychological services (67.5% of the players indicated a great need or need for psychological skills training sessions), as it could hold value for performance improvement within the sport. The introduction to sport psychological skills training at the junior and sub-elite levels of sport primarily falls within the responsibility of the coach (Gould *et al.*, 1999). Within the South African context, however, 84% of teachers who coach at the secondary school level have not received any training in sport psychology (Le Roux & Pienaar, 2001), resulting in players who do not possess sound foundational skills required for optimal performance. In addition to this problem, no information exists on the sport psychological skills of junior rugby players in South Africa. In fact, research into the sport psychological skills of rugby union players in general is very limited.

Researchers (Maynard & Howe, 1989; Hodge & McKenzie, 2002; Kruger, 2003; Golby & Sheard, 2004; Kruger, 2005) studying the relationship between different sport psychological skills and rugby performance often attempt to describe this relationship by comparing players from different competitive levels or by comparing players from successful teams with players from less successful teams. In this regard Hodge and McKenzie (2002) found higher self-confidence levels in more successful rugby players. Kruger (2003) showed that the top placed South African team in the 2003 Super 12 tournament scored significantly higher ($p<0.05$) in goal setting/mental preparation, concentration, confidence and achievement motivation than the other

three South African teams. English international rugby league players were reported to show significantly higher ($p<0.05$) attentional control than their division one counterparts (Golby & Sheard, 2004). The latter finding is, however, in contrast with that of Maynard and Howe (1989), who found no such differences for attentional control. Lastly, Kruger (2005) noted significantly better ($p<0.05$) general coping skills, concentration skills, coachability and less worries among South African Super 12 players, compared to senior South African club rugby players.

From these results it is clear that certain sport psychological skills are related to success in rugby. The lack of research on the sport psychological skills of junior rugby players and its effect on performance makes research on this topic imperative. The subsequent purpose of this study is, therefore, to distinguish between u/19 club rugby players of different participation levels based on:

- their prior exposure to sport psychologists and sport psychological skills training programmes (SPSTP)
- their perceived importance of SPSTP
- their perceived ability to be psychologically prepared for competitions
- their expressed need for SPSTP
- psychosocial factors influencing their participation and performance in rugby
- their general reaction to change and specific situations
- their sport psychological skills profiles.

METHOD

Subjects

The subjects are elite student rugby players enrolled at an institution for higher learning in South Africa. They were all first year students at the North-West University (Potchefstroom Campus) and affiliated with the PUK Rugby Institute (PRI) during the 2004 and 2005 seasons. It should be noted that the first year at university is a difficult time for most students, as they have to adapt to various new situations. The players were, therefore, tested after an initial period of two months at the university (two months into the pre-season training). At the end of these two seasons, respectively, the u/19 coaching panel from the PRI identified and ranked the top four u/19 players in each playing position for that particular season. This meant that 120 u/19 rugby union players (18.78 ± 0.28 years) from the PRI were included in this study. This group consisted of 107 white, 7 coloured and 6 black players. The highest previous representative levels of these players are: South African schools team (n=2), Cravenweek provincial team

(n=29), provincial academy team (n=50), secondary school teams (n=39). According to the above-mentioned ranking, the top two ranked players in each position were included in the top group, while those ranked third and fourth respectively were included in the lower ranked group. It should be noted that these subjects were not randomly selected to participate in this study from a larger population pool. This study is merely interested in describing tendencies of the top ranked 60 players compared to the other 60 players of the PRI over the 2004 and 2005 seasons. Caution should, therefore, be applied when generalizing the results to u/19 rugby players in general. The implications of this point will be discussed further when describing the statistical analysis that was conducted.

Test procedure

Administration of testing

The study was approved by the Ethics Committee of the Faculty of Health Sciences at the North-West University, Potchefstroom Campus (reference number 058K13). Players were tested at corresponding times in each of the two seasons, i.e. two months into the pre-season. All of the players completed informed consent forms. Parental permission was also obtained. At the time of testing no sport psychological skills training sessions had been conducted. The purpose of the study and confidentiality of the individual player results were explained to the players. It was specifically mentioned that no coaches would have access to the results. The results could, therefore, not influence team selection, thereby reducing the effect of socially desirable answers from the players.

Demographic, general rugby and sport psychology questionnaire

Demographic information (name, surname, birth date, test date, age and race), rugby playing history (years of playing, playing position(s)) and sport psychology background (visits to sport psychologists (individually or team), importance of sport psychology, need for sport psychological services, the extent to which the player feels he can prepare himself psychologically for matches) were gathered by means of a questionnaire developed for and implemented as part of the SPSTP of the PRI. Subjects also had to indicate the effect of general psychosocial factors on their participation and performance in rugby, as well as their reaction to change on a 5 point Likert scale ranging from 1 (very negative) to 5 (very positive).

Sport psychological skills questionnaires

The various sport psychological skills and constructs were measured using three reliable and valid sport psychological questionnaires, i.e. the Competitive State Anxiety Inventory–2 (CSAI-

2) of Martens *et al.* (1990), the Athletic Coping Skills Inventory–28 (ACSI-28) of Smith *et al.* (1995) as well as the Psychological Skills Inventory (PSI) of Wheaton (1998).

The CSAI-2 is a self-report questionnaire consisting of three nine-item sub-scales measuring somatic state anxiety, cognitive state anxiety and state self-confidence. Individual items are rated on a 4-point Likert scale from 1 (*not at all*) to 4 (*very much so*). Sub-scale scoring is additive, although one somatic anxiety item has reversed scoring, yielding sub-scale totals ranging from 9 to 36. Initial psychometric tests (Martens *et al.*, 1990) confirmed solid internal consistency for all the sub-scales, with alpha reliability coefficients ranging from r=0.79 to r=0.90. The initial concurrent validity research (Martens *et al.*, 1990) on the CSAI-2 demonstrated reasonably consistent relationships with eight previously validated state and trait inventories.

The ACSI-28 measures coping with adversity, peaking under pressure, goal setting/mental preparation, concentration, freedom from worry, confidence and achievement motivation, as well as coachability. Lastly, the average value for the above seven skills is calculated to produce a personal coping resources score. Athletes had to read statements which describe experiences of other athletes and had to recall the frequency of similar experiences. Each sub-scale is composed of four items measured on a 4-point Likert scale ranging from 0 (*almost never*) to 3 (*almost always*). Each of the sub-scale scores can, therefore, range from 0 to 12 and the composite personal coping resources score can range from 0 to 84. The results are converted to a percentage score with higher values reflecting better skill levels. Test-retest reliability of the personal coping resources score on the ACSI-28 was found to be r=0.87 over a one week period for a sample of 97 male and female college athletes. Internal consistency reliability of the ACSI-28 total score was r=0.86. Preliminary concurrent validity evidence was reported as the sub-scales were shown to be related to various sport psychological questionnaires (Smith *et al.*, 1995).

The PSI (consisting of 64 items) measures achievement motivation, goal directedness, activation control, maintaining self-confidence, concentration and mental rehearsal from which an average psychological skills score is derived. Each skill consists of ten items measured on a 5-point Likert scale ranging from 0 (*never*) to 4 (*always*). Reverse scoring applies in some cases with the sub-scale scores expressed as percentages. Higher values also reflect better sport psychological skill levels. The test-retest reliability on the PSI was found to range from r=0.84 to r=0.97 (Wheaton, 1998). The validity of this questionnaire is, currently, subject to further testing, but this questionnaire has been included in the study as it is currently being used by the South African Sports Confederation and Olympic Committee in their High Performance Programme.

Statistical analysis

The statistical package Statsoft Inc. (2004) was used to process the data. The descriptive statistics (averages and standard deviations) of each test variable of the two groups were calculated and significance of differences between the more and less successful groups of PRI players was determined by means of effect sizes. Since it was not a randomly selected group, the use of t-tests to compare the two groups is not permitted. The use of effect sizes (ES) to indicate practically significant differences is more suitable (Steyn, 2006) in which ES = $(M_1 - M_2)/s$ (Thomas & Nelson, 2001). Here, M_1 = the mean of the first group in the comparison, M_2 = the mean of the second group in the comparison and s = the standard deviation. Thomas and Nelson (2001) recommend that the pooled standard deviation be used in research designs such as the present one:

$$sp = \sqrt{\frac{s_1^2(n_1-1)+s_2^2(n_2-1)}{n_1+n_2-2}}$$

Here, Sp = the pooled standard deviation, s_1^2 = the variance of the players in the first group, s_2^2 = the variance of the players in the second group, n_1 = the number of players in the first group and n_2 = the number of players in the second group. Effect sizes are expressed as Cohen's d-value and can be interpreted as follows: an ES of more or less 0.8 is large, an ES of more or less 0.5 is moderate and an ES of more or less 0.2 is small (Thomas & Nelson, 2001).

RESULTS AND DISCUSSION

Figures 1-4 report on the previous consultations with sport psychologists, the perceived importance of SPSTP, the perceived ability to be psychologically well prepared for competitions and the perceived need for SPSTP, for the top ranked (n=60) and lower ranked (n=60) players, respectively.

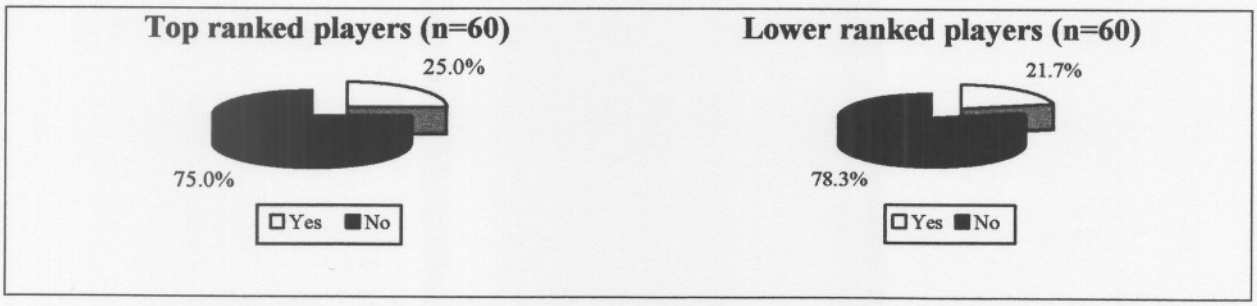

Figure 1. **THE PERCENTAGE OF PLAYERS WHO PREVIOUSLY CONSULTED A SPORT PSYCHOLOGIST (INDIVIDUALLY OR DURING TEAM SESSIONS)**

No considerable differences exist regarding the top and lower ranked players' previous consultations with sport psychologists. Collectively only 23.3% of the tested subjects previously consulted with sport psychologists. This result may seem to contradict the findings of Kruger (2003) who reported that only 2.8% of South African Super 12 players consulted sport psychologists. It should be taken into account that the present study also included consultations during team sessions, whereas the last-mentioned researcher only reported on players who consulted with sport psychologist on an individual basis.

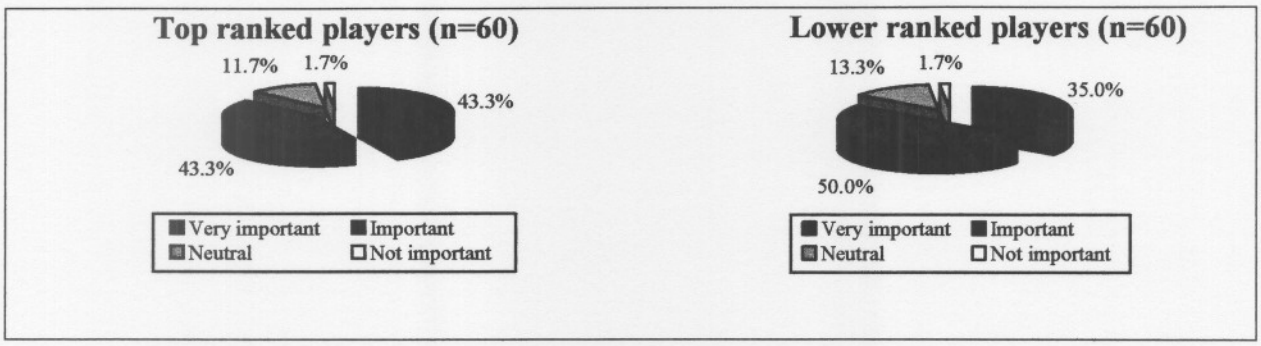

Figure 2. **THE PERCEIVED IMPORTANCE OF SPSTP**

Reasonably similar perceptions regarding the importance of SPSTP were expressed by the players from the two tested groups. A slight difference was observed in that more of the top ranked players compared to lower ranked players perceive SPSTP as very important (43.3% vs. 35.0%). This, however, led to an inverse situation regarding players who perceive SPSTP as important as 43.3% of the top ranked players compared to 50.0% of the lower ranked players held this perception. Similar percentages of the players were uncertain about the importance of SPSTP (11.7% vs. 13.3%) or perceived it as unimportant (1.7% each).

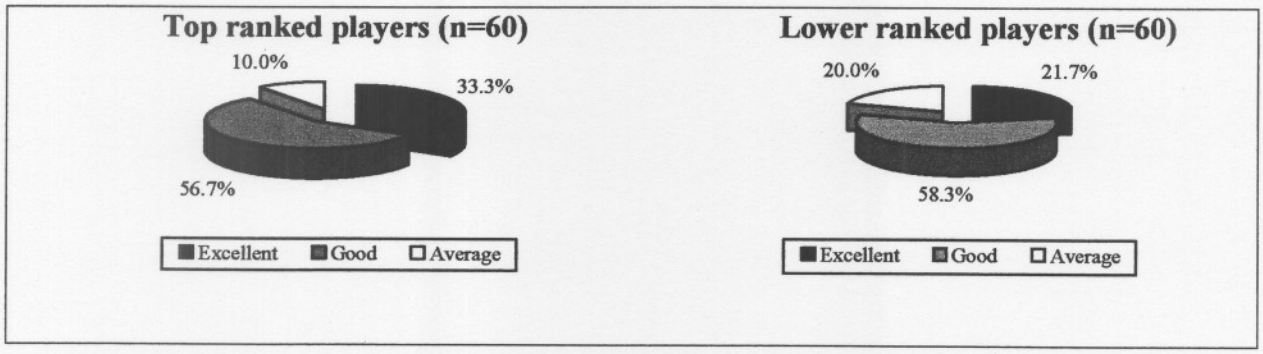

Figure 3. **THE PLAYERS' PERCEIVED ABILITY TO BE PSYCHOLOGICALLY WELL PREPARED FOR COMPETITIONS**

A considerable difference (top group: 33.3% vs. lower group: 21.7% excellently prepared) exists regarding the players' perceived psychological preparation for competitions. Similar percentages

indicate that they are well prepared (56.7% vs. 58.3%), resulting in more players from the lower ranked group (20.0% vs. 10.0%) who perceive their psychological preparation as being average. Collectively, these results compare well with that of South African Super 12 players as reported by Kruger (2003) and further indicate room for improvement, which should be addressed through SPSTP.

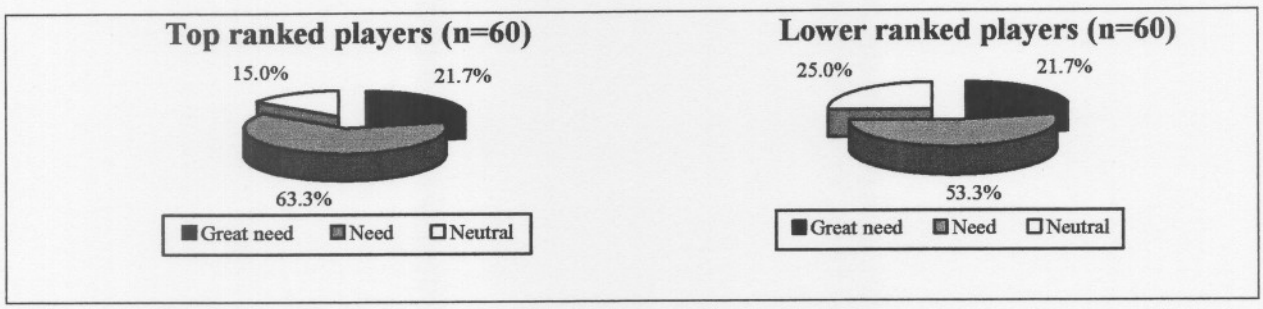

Figure 4. **THE PLAYERS' PERCEIVED NEED FOR SPSTP**

The same percentage of players in the two groups (21.7%) expressed a great need for SPSTP. Among the remaining players, a greater number of top ranked players showed a great need for SPSTP, possibly brought about by a more serious approach to their rugby careers than the lower ranked players. Despite the evidence that shows that the majority of professional and amateur athletes is of the opinion that they could benefit from sport psychological services (Ferraro & Rush, 2000), this study found that 20.0% of the total number of players had a neutral need for SPSTP. Meyers *et al.* (1995) justified such results by reporting that there are certain athletes who feel that they can deal with their own emotions without any outside help. Furthermore, the lack of previous exposure to sport psychologists and SPSTP (Figure 1) may contribute to this finding, since the players may not know how such programmes can be of benefit.

As previously noted, the subjects in this study are first year students at a tertiary institute. Therefore, these players underwent major changes (related to rugby and life in general) in the two months prior to being tested. It was, therefore, also decided to compare the two groups of players regarding general psychosocial factors and circumstances influencing participation and performance in rugby, as well as their reaction to change. The results of these self-evaluations are reported in Tables 1 and 2. The different psychosocial factors, circumstances and reaction to change items are placed in order of importance/impact, starting with the factors which the top ranked players perceive as being the most facilitative towards participation and performance and ending with the most debilitative factor towards participation and performance.

TABLE 1. **GENERAL PSYCHOSOCIAL FACTORS AND CIRCUMSTANCES INFLUENCING PARTICIPATION AND PERFORMANCE IN RUGBY**

Variables	Top ranked players (n=60) M ± SD	Lower ranked players (n=60) M ± SD	Effect sizes (d-value)
Effect of family/personal life	4.57 ± 0.70	4.57 ± 0.65	0.00
Effect of team members/team spirit	4.48 ± 0.50	4.15 ± 0.84	0.47*
Effect of coaches	4.40 ± 0.69	4.10 ± 0.86	0.38*
Effect of home games	4.22 ± 0.74	4.18 ± 0.89	0.05
Thoughts about what the future has in stall	4.13 ± 0.87	3.83 ± 0.96	0.33
Effect of spectators	3.87 ± 0.77	3.65 ± 0.68	0.30
Effect of the score board	3.67 ± 1.27	3.78 ± 1.03	-0.10
Effect of away games	3.45 ± 0.72	3.83 ± 0.67	-0.55*
Effect of financial aspects	3.32 ± 0.70	3.05 ± 0.77	0.37*
Thoughts about possibly losing my place in the team to a quota player	3.17 ± 1.29	2.97 ± 1.26	0.16
Effect of referees	2.98 ± 0.39	2.98 ± 0.62	0.00
Thoughts about possibly losing my place in the team to another player	2.98 ± 1.08	2.88 ± 1.14	0.09
Possibility of a career ending injury	2.97 ± 1.21	2.70 ± 1.36	0.21
Academic pressure experienced	2.92 ± 0.83	2.80 ± 0.90	0.14
The perceived effect of the quota system on own performance	2.10 ± 1.31	2.10 ± 1.12	0.00

Effect sizes: ** d=0.8: large; * d=0.5: moderate and d=0.2: small

TABLE 2. **THE RUGBY PLAYERS' REACTION TO CHANGE**

Variables	Top ranked players (n=60) M ± SD	Lower ranked players (n=60) M ± SD	Effect sizes (d-value)
Fitting in with new team members	4.25 ± 0.88	3.75 ± 1.02	0.52*
Being part of a new team spirit	4.25 ± 0.91	3.95 ± 0.95	0.32
Fitting in with new game plans	4.05 ± 0.85	3.75 ± 0.91	0.34
Settling in with new coaches	3.92 ± 0.87	3.55 ± 0.95	0.41*
General ability to adapt to change	3.88 ± 1.03	3.43 ● 1.20	0.40*

Effect sizes: ** d=0.8: large; * d=0.5: moderate and d=0.2: small

Both these tables emphasize the important interaction between the players and their coaches. The top players held moderately greater, positive reflections about the effect of their coaches on their performance (d=0.38) and their ability to adapt to new coaches at the PRI (d=0.41). Similarly, the influence of team mates and the team spirit on performance (d=0.47) and fitting in with new team mates (d=0.52) were more favourable among the top ranked players than the lower ranked players. The top ranked players perceived their own ability to adapt to change in general to be moderately better (d=0.40) than the lower ranked players. Another moderately significant difference between the two groups was financial aspects, in which the top ranked players

perceived this aspect as being more facilitative than the lower ranked players. A plausible explanation for this is the statistics which show that 51 of the top ranked players, compared to 12 of the lower ranked players were bursary holders. The amount that the 63 bursary holders received were on average enough to pay for tuition fees, accommodation and certain rugby related expenses, It is, therefore, clear that the lower ranked players experienced more financial difficulties with perceived negative participation and performance consequences.

Interestingly, the top ranked players perceived the effect of the scoreboard (d=-0.10) and away games (d=-0.55) as more debilitative than the lower ranked players. The latter finding is difficult to explain. Furthermore, these tables also brought to light certain factors which have potentially negative effects on the participation and performance of the players, i.e. average values below 3.0. These are the perceived effect of the quota system on their own performance (top=2.10 ± 1.3; lower=2.10 ± 1.12), academic pressure (top=2.92 ± 0.83; lower=2.80 ± 0.90), thoughts about serious career ending injuries (top=2.97 ± 1.21; lower=2.70 ± 1.36), effects of referees (top=2.98 ± 0.39; lower=2.98 ● 0.62) and thoughts about possibly losing a place in the team to another player (top=2.98 ± 1.08; lower=2.88 ± 1.14). To a large extent the top and lower ranked players reported similar values for these factors. These factors should deliberately be accounted for in the coaching programme of these players to prevent any debilitative effect thereof on participation and performance.

Although the aforementioned results shed light on important psychosocial factors which distinguish between rugby players of different participation levels, the real interest of this study lies in the question whether or not it is possible to distinguish between rugby players of different participation levels based on their sport psychological skills profiles. The subsequent comparisons between the two groups of players for the CSAI-2, ACSI-28 and PSI constructs and skills are reported in Tables 3-5.

Small effect sizes (practical significance) were observed for both cognitive and somatic state anxiety. A moderately significant difference (d=0.44) was observed for state self-confidence, with the top ranked players showing better self-confidence levels. In fact, this finding is upheld when using other measurement instruments such as the ACSI-28 and PSI (see similar results in Tables 4 and 5). These results emphasize the importance of high self-confidence levels in order to attain success in rugby and are in agreement with the previously reported results of Hodge and McKenzie (2002).

TABLE 3. **COMPARISONS BETWEEN THE TOP AND LOWER RANKED PLAYERS FOR COGNITIVE STATE ANXIETY, SOMATIC STATE ANXIETY AND STATE SELF-CONFIDENCE, AS MEASURED WITH THE CSAI-2 (MARTENS *ET AL.*, 1990)**

Percentiles: The data from the total subject group (N=120) were used to determine every 5th percentile for each specific variable. The specific percentile in which the average value of a particular group fell is highlighted.								
35%	40%	45%	50%	55%	Variables	Groups	M ± SD	Effect size (Cohen's d-value)
		Lower	Top		Cognitive state anxiety•	Top (n=60) Lower (n=60)	20.92 ± 4.87 19.80 ± 5.47	0.22
			Lower	Top	Somatic state anxiety•	Top (n=60) Lower (n=60)	21.15 ± 5.23 20.58 ± 5.13	0.11
Lower				Top	State self-confidence	Top (n=60) Lower (n=60)	26.32 ± 4.97 24.15 ± 4.94	0.44*

• Lower anxiety scores represent better construct levels. Effect sizes: ** d = 0.8: large; * d = 0.5: moderate and d = 0.2: small

Since performance accomplishments are associated with self-confidence (Weinberg & Gould, 2003), success could further give rise to increased self-confidence levels. The relationship between self-confidence and performance outcome is a reciprocal one, in which high levels of self-confidence contributes to success, while success should result in further increases in self-confidence.

TABLE 4. **COMPARISONS BETWEEN THE TOP AND LOWER RANKED PLAYERS FOR THE VARIOUS COPING SKILLS, AS MEASURED WITH THE ACSI-28 (SMITH *ET AL.*, 1995)**

Percentiles: The data from the total subject group (N=120) were used to determine every 5th percentile for each specific variable. The specific percentile in which the average value of a particular group fell is highlighted.								
40%	45%	50%	55%	60%	65%	Variables	Groups	M ± SD	Effect size (Cohen's d-value)
Lower			Top			Personal coping resources score	Top (n=60) Lower (n=60)	65.77 ± 11.53% 59.88 ± 12.79%	0.48*
Lower				Top		Coping with adversity	Top (n=60) Lower (n=60)	69.56 ± 19.76% 61.11 ± 18.84%	0.44*
		Lower	Top			Peaking under pressure	Top (n=60) Lower (n=60)	54.58 ± 15.83% 51.26 ± 17.21%	0.20
			Lower		Top	Goal setting / Mental preparation	Top (n=60) Lower (n=60)	55.56 ± 17.61% 50.83 ± 22.48%	0.23
	Lower				Top	Concentration	Top (n=60) Lower (n=60)	67.50 ± 15.55% 61.84 ± 19.52%	0.32
	Lower		Top			Freedom from worry	Top (n=60) Lower (n=60)	52.50 ± 18.04% 47.49 ± 18.88%	0.37
Lower				Top		Confidence and achievement motivation	Top (n=60) Lower (n=60)	59.73 ± 11.07% 52.93 ± 14.62%	0.52*
	Lower	Top				Coachability	Top (n=60) Lower (n=60)	55.98 ± 17.43% 53.75 ± 16.27%	0.13

Effect sizes: ** d = 0.8: large; * d = 0.5: moderate and d = 0.2: small

In addition to confidence and achievement motivation (d=0.52) the top ranked players had better personal coping resources scores (d=0.48) and were more able to cope with adversity (d=0.44) than the lower ranked players. In using the same questionnaire (the ACSI-28), Kruger (2005)

found significantly higher ($p<0.05$) personal coping resources scores among South African Super 12 players than senior club players. Collectively, these results show the importance of sound general coping skills and specifically the ability to maintain emotional control, remain calm and related, while being positive and enthusiastic despite difficult match situations (coping with adversity). These skills are needed to excel at the highest level and can distinguish between rugby union players from different competitive levels.

TABLE 5. **COMPARISONS BETWEEN THE TOP AND LOWER RANKED PLAYERS FOR THE VARIOUS SPORT PSYCHOLOGICAL SKILLS, AS MEASURED WITH THE PSI (WHEATON, 1998)**

Percentiles: The data from the total subject group (N=120) were used to determine every 5th percentile for each specific variable. The specific percentile in which the average value of a particular group fell is highlighted. 35% 40% 45% 50% 55% 60%	Variables	Groups	M ± SD	Effect size (Cohen's d-value)
Lower / Top	Average psychological skills	Top (n=60) Lower (n=60)	71.58 ± 10.98% 66.59 ± 10.99%	0.45*
Lower / Top	Achievement motivation	Top (n=60) Lower (n=60)	83.00 ± 11.30% 79.83 ± 11.46%	0.38
Lower / Top	Goal directedness	Top (n=60) Lower (n=60)	70.79 ± 15.14% 65.42 ± 18.10%	0.32
Lower / Top	Activation control	Top (n=60) Lower (n=60)	66.88 ± 14.78% 60.75 ± 14.03%	0.43*
Lower / Top	Maintaining self-confidence	Top (n=60) Lower (n=60)	70.63 ± 15.40% 64.79 ± 16.04%	0.37
Lower / Top	Concentration	Top (n=60) Lower (n=60)	71.13 ± 11.54% 67.83 ± 13.96%	0.26
Lower / Top	Mental rehearsal	Top (n=60) Lower (n=60)	65.42 ± 14.12% 60.88 ± 17.58%	0.28

Effect sizes: ** d = 0.8: large; * d = 0.5: moderate and d = 0.2: small

Two more skills were outlined as practically significant in distinguishing between top and lower ranked rugby players, i.e. the average psychological skills score (d=0.45) and activation control (d=0.43). These results were not previously seen in published literature. Activation control, refers to an athletes' ability to reach his optimal arousal level for peak performances, which Hanin (2000) termed the individual zone of optimal functioning (IZOF). This IZOF or level of arousal is specific to each individual and from the results in Table 5 it seems as if the top ranked players are more aware of their arousal levels and more effective in activating or deactivating their arousal levels in order to achieve peak performances.

Collectively, the results indicate that the top ranked players outscored the lower ranked players on average in all but two of the eighteen tested sport psychological skills or constructs. The two constructs in which the lower ranked players' average values were slightly better (lower scores representing better results in both cases) are cognitive state anxiety and somatic state anxiety. Despite these higher anxiety levels, it is shown that the top ranked players might be more

effective at managing their anxiety in order to perform optimally, by applying their better general coping and sport psychological skills and their ability to control their activation levels effectively. In this regard Kruger (2005) reported that rugby players with high overall psychological skills scores experienced their symptoms of both cognitive and somatic anxiety as more facilitative to performance than players with low overall psychological skills scores.

CONCLUSIONS AND RECOMMENDATIONS

Although only slight differences exist regarding previous consultations, the perceived importance, abilities and need for SPSTP, the results from the total group emphasize the development and systematic implementation of SPSTP.

Furthermore, the results of this study unequivocally show that rugby players (even as early as the u/19 level) can be distinguished based on certain psychosocial factors and their sport psychological skill levels. The results pertaining to the general psychosocial factors influencing participation and performance as well as the players' reaction to change holds important information for the coaching programme for elite first year student rugby players. Specific attention needs to be given to fostering good player-coach relationships and team spirit. Sensitivity and transparency regarding the quota system, continuity in team selection, the players' reactions to refereeing decisions and allowing substantial time for academic responsibilities must be accounted for. It is also recommended that other psychosocial factors applicable to the team sport situation such as communication skills, interpersonal and social adaptation skills as well as team dynamic factors be researched.

The importance of sound sport psychological skills is stressed as self-confidence, personal coping resources, coping with adversity, average psychological skills as well as activation control can distinguish between rugby players from different participation levels. Despite these results, players should not be selected based solely on their sport psychological profiles (Weinberg & Gould, 2003). According to Cox and Yoo (1995) physique, strength, speed and skill levels should be the primary selection criteria. The sport psychological skill levels of these tested players again emphasize the need for and importance of developing sound sport psychological skills as it is clearly related to team selection.

The systematic and consistent SPSTP currently implemented by the PRI (three part-time sport psychology consultants working with the u/19, u/21 and senior squads respectively) bodes well for the development and performances of the PRI players and teams. However, the effectiveness

of the current programme must be researched. Since university rugby is seen as the breeding ground for "tomorrow's stars", the sport scientific approach of the PRI holds great benefits for South African rugby as a whole.

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3 Positional Differences In The Sport Psychological Skill Levels Of Rugby Union Players

This article will be submitted for publication in The Sport Psychologist. It is hereby included according to the specific guidelines of the journal which are presented in Appendix B (Submission Guidelines).

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Positional differences in the sport psychological skill levels of rugby union players

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This study examined positional differences regarding seven sport psychological skills in a group of 180 u/19 rugby union players (average: 18.79 ± 0.28 yrs). 24 Props, 12 hookers, 24 locks, 36 loose forwards, 24 half-backs, 24 inside backs and 36 outside backs completed the Psychological Skills Inventory of Wheaton (1998). Effect sizes (expressed as Cohen's d-value) were used to indicate practical significance. No significant differences were observed for the comparisons between the forwards and backline players. Moderate (46) to large (20) practically significant differences were reported for the 147 inter-positional comparisons. The results show that the half-backs and hookers consistently out performed the other positional groups, while the props, locks and back three often showed the lowest skill levels. Results are discussed in reference to practical implications for future position specific sport psychological skills training sessions.

A rugby union team consists of 15 players (and 7 reserves) in specialized positions, each with its own physiological, morphological, game specific and psychological requirements. Numerous studies have set out to identify physiological factors (Bell, 1980; Reilly, 1997; Pienaar, Spamer & Pretorius, 2000; Deutsch, 2001; Doutreloux, Tepe, Demont, Passelergue & Artigot, 2002), morphological attributes (Bell, 1980; Ferreira, 1985; Lee, Myers & Garraway, 1997; Reilly, 1997; Doutreloux, Artigot & Thon, 2000; Doutreloux, Bergougnou, Cayon, Artigot & Thon, 2000; Pienaar, Spamer & Pretorius, 2000; Wilders & De Ridder, 2001) and game specific skills (Pienaar, Spamer & Pretorius, 2000; James, Mellalieu & Jones, 2005) that discriminate between players in the various playing positions. As rugby union is a full contact sport with a high risk of injury (Du Toit, Venter, Buys, & Olivier, 2004), playing position has also been studied as a possible mediating factor in the etiology of injuries sustained during training and matches (O'Brien, 1992; Lee, Myers & Garraway, 1997; Alsop, Morrison, Williams, Chalmers & Simpson, 2005; Brooks, Fuller, Kemp & Reddin, 2005).

Research into the relationship between psychological characteristics and sport performance continues to be an important area of study for sport psychologists. Sport psychological skills such as achievement motivation (Hodge & McKenzie, 2002), goal directedness, activation control, self-confidence (Hodge & McKenzie, 2002), concentration (Summers, Christensen & Sheath, 2002; Maynard & Howe, 1989; Golby & Sheard, 2004) and mental rehearsal (Hale & Howe, 2002) have often been linked to success in team sports such as rugby union, and will subsequently be investigated in this study.

The relationship between sport psychological skills and different playing positions is also an important research area because the demands placed on an athlete differ as a function of playing position (Cox & Yoo, 1995). Only two studies (Maynard & Howe, 1989; Kruger, 2005) could be found on the sport psychological skill levels of rugby players in different playing positions. Maynard and Howe (1989) reported that halfbacks (scrumhalves and

flyhalves) have significantly better ($p<0.05$) broad external focus and are less likely to make mistakes due to a narrowed attentional focus than players of other playing positions. Kruger (2005) found no positional differences for sport psychological skills among senior club, provincial and Super 12 rugby players in South Africa.

Due to the lack of research pertaining to sport psychological skills and playing position in rugby union, results from studies on American Football players (Nation & LeUnes, 1983; Schurr, Rusle, Nisbet & Wallace, 1984; Cox & Yoo, 1995), basketball players (Erculj & Vicic, 2001) and soccer players (Kirkcaldy, 1982; Yoo, 1990; Kruer & Spalding, 2003) will be brought to light. Cox and Yoo (1995) reported statistically significant differences ($p<0.05$) between American football players in different playing positions regarding anxiety control, concentration and confidence. Nation and LeUnes (1983) revealed mood differences, while Schurr et al. (1984) found positional differences for preferred Myers-Briggs personality type indicators among American football players. Basketball players in the centre position were shown to have less favourable motivational dimensions than players in both the guard and forward positions (Erculj & Vicic, 2001). Personality analysis of team sport athletes by Kirkcaldy (1982) suggested that offensive, attacking players were more tough-minded, dominant, aggressive and extraverted than midfield players. Kruer and Spalding's (2003) study on NCAA soccer players revealed no significant differences between playing positions for sport psychological skills.

From the above-mentioned literature it is eminent that sport psychological skills play an important role in rugby. Research also suggests that positional differences may possibly exist regarding sport psychological skill levels. Information on the differences in sport psychological skills between different rugby playing positions is, however, limited. Results from other sport also seem to be limited and are often contradicting. Hence, the purpose of this study is to compare the sport psychological skill levels of rugby union players in different playing positions.

Method

Participants

One hundred and eighty u/19 elite student rugby union players (18.79 ± 0.28 years) from the PUK Rugby Institute (PRI) were included in this study. This group consisted of 165 white, 9 coloured and 6 black players. The highest previous representative levels of these players are: South African schools team (n=5), Cravenweek provincial team (n=58), provincial academy team (n=72) and secondary school teams (n=45). In order to compare the different playing positions, these players were further divided into seven positional groups; i.e. props (n=24), hookers (n=12), locks (n=24), loose trio (n=36), half backs (n=24), centres (n=24) and the back three (n=36). It should be noted that these participants were not randomly selected from a larger population pool. This study is merely interested in describing positional tendencies within this group of players. Caution should, therefore, be applied when generalizing the results to other u/19 union rugby players. The implications of this point will be further discussed when describing the statistical analysis that was conducted.

Instruments

The Psychological Skills Inventory (PSI) of Wheaton (1998) was used to measure achievement motivation, goal directedness, activation control, maintaining self-confidence, concentration and mental rehearsal. The averages of these six subscales were also used to derive a composite psychological skills score. The PSI consists of 64 items measured on a 5-

point Likert scale ranging from 0 (never) to 4 (always). Higher values (expressed as percentages) reflect better sport psychological skill levels. The test-retest reliability on the PSI was found to range from r=0.84 to r=0.97 (Wheaton, 1998). Although the validity of this questionnaire is currently subject to further testing, this questionnaire is currently being used by the South African Sports Confederation and Olympic Committee on elite South African athletes and is subsequently used in the present study.

Procedure

The study was approved by the Ethics Committee of the Faculty of Health Sciences at the North-West University, Potchefstroom Campus (reference number 058K13). Players were tested at corresponding times in each of the three seasons (2003-2005), i.e. two months into the pre-season. All of the players completed informed consent forms. Parental permission was also obtained. At the time of testing no sport psychological skills training (PST) sessions had been conducted. The purpose of the study and confidentiality of the individual player results were explained to the players. It was specifically mentioned that no coaches would have access to the results. The results could, therefore, not influence team selection, thereby reducing the effect of socially desirable answers from the players. At the end of the 2003, 2004 and 2005 rugby seasons, a coaching panel from the (PRI) identified the top four u/19 rugby players in each playing position for that particular season. This resulted in 180 participants in the present study.

Analysis

The Statistical Consultation Service of the North-West University determined the statistical methods and procedures for the analysis of the data. The statistical data processing package (Statsoft Inc, 2004) was used to analyze the data. Descriptive statistics (averages and standard deviations) are used to report on the sport psychological skill levels of the different positional groups. Since this is not a randomly selected group, the use of t-test to compare the positional groups is not permitted for this research. The use of effect sizes (ES) to indicate practically significant differences is, however, suitable (Steyn, 2006), in which ES = $(M_1 - M_2)/s$ (Thomas & Nelson, 2001).

Here, M_1 = the mean of the first positional group in the comparison, M_2 = the mean of the second positional group in the comparison and s = the standard deviation. Thomas and Nelson (2001) recommend that the pooled standard deviation be used in research designs such as the present one:

$$s_p = \sqrt{\frac{s_1^2(n_1-1)+s_2^2(n_2-1)}{n_1+n_2-2}}$$

Here, Sp = the pooled standard deviation, s_1^2 = the variance of the players in the first group, s_2^2 = the variance of the players in the second group, n_1 = the number of players in the first group and n_2 = the number of players in the second group. Effect sizes are expressed as Cohen's d-value and can be interpreted as follows: an ES of more or less 0.8 is large, an ES of more of less 0.5 is moderate and an ES of more or less 0.2 is small (Thomas & Nelson, 2001).

Results

In the first analysis the forwards (n=96) and backline players (n=84) were compared by means of effect sizes for each of the seven sport psychological skills. Only small (d<0.2) practical significance was observed. Therefore, these results are not reported. After this comparison, the seven positional groups were compared in the same manner. The averages

and standard deviations for each positional group are reported in Tables 1-7, together with the d-values for each of the comparisons. Moderate (*) and large (**) practical significance is indicated, while the differences between the positional groups are illustrated. The data from the total participant group (N=180) were used to determine the percentile range (from 5th – 100th percentile) for each of the seven sport psychological skills. The specific percentile, in which the average value of a particular positional group fell, is indicated with an X. This is an attempt to illustrate the differences between the positional groups visually, based on a comparison between the positional group and the total participant group.

Table 1. Descriptive statistics and comparisons between the different positional groupings for the composite psychological skills score.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x. Percentile.									Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
35%	40%	45%	50%	55%	60%	65%	M ± SD	Positional groupings	Effect sizes (Cohen's d-value)						
		x					68.6±10.4% (n=24)	Props (#1 & 3)		0.6*	0.1	0.3	0.7**	0.1	0.2
						x	75.4±11.3% (n=12)	Hookers (#2)			0.6*	0.4*	0.0	0.5*	0.7**
	x						67.8±10.9% (n=24)	Locks (#4 & 5)				0.3*	0.8**	0.2	0.1
				x			71.4±9.5% (n=36)	Loose trio (#6, 7 & 8)					0.4*	0.2	0.4*
						x	75.1±8.1% (n=24)	Half backs (#9 & 10)						0.6*	0.8**
		x					69.6±10.4% (n=24)	Centres (#12 & 13)							0.3
x							66.6±12.1% (n=36)	Back three (#11, 14 & 15)							

Effect sizes: ** d = 0.8 (large), * d = 0.5 (moderate) and d = 0.2 (small)

The graphical illustrations show that for the composite psychological skills score the hookers and half-backs had the best values (both groups' average values fell within the 65th percentile), whereas the back three and locks were the weakest (average values fell in the 35th and 40th percentile respectively). The half-backs tested significantly better than the props, locks, back three (large effect sizes), loose trio and centres (moderate effect sizes). The hookers had moderately better values than the props, locks, loose trio and centres, while large effect sizes were observed for their comparison with players in the back three playing positions. The composite psychological skills score of the back three were also moderately lower than that of the loose trio. From this table it is eminent that considerable positional differences do exist for the composite psychological skills score. This score represents the average value for achievement motivation, goal directedness, activation control, maintaining self-confidence, concentration and mental rehearsal. Tables 2-7 report on the trends for each of the six individual skills, indicating specific differences between the seven positional groups.

The achievement motivation values of the half-backs were significantly larger than that of the props, locks, centres and back three (large practical significance) as well as the loose trio and hookers (moderate practical significance). The hookers and loose trio showed higher values than the back three. The average values of the half-backs fell in the 65th percentile, while the average values of the back three fell within the 30th percentile.

Table 2. Descriptive statistics and comparisons between the different positional groupings for achievement motivation.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x.

Percentile.										
30%	35%	40%	45%	50%	55%	60%	65%	M ± SD	Positional groupings
		X						81.5±13.1% (n=24)	Props (#1 & 3)
				X				85.2±8.8% (n=12)	Hookers (#2)
		X						82.2±10.1% (n=24)	Locks (#4 & 5)
				X				84.7±10.0% (n=36)	Loose trio (#6, 7 & 8)
							X	88.8±6.2% (n=24)	Half backs (#9 & 10)
		X						81.5±13.1% (n=24)	Centres (#12 & 13)
X								78.8±11.3% (n=36)	Back three (#11, 14 & 15)

Effect sizes (Cohen's d-value)						
Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
	0.3	0.1	0.3	0.7**	0.0	0.2
		0.3	0.0	0.5*	0.3	0.6*
			0.3	0.8**	0.1	0.3
				0.5*	0.3	0.6*
					0.7**	1.0**
						0.2

Effect sizes: ** d = 0.8 (large); * d = 0.5 (moderate) and d = 0.2 (small)

Table 3. Descriptive statistics and comparisons between the different positional groupings for goal directedness.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x.

Percentile.									
30%	35%	40%	45%	50%	55%	60%	65%	M ± SD	Positional groupings
X								63.6±14.3% (n=24)	Props (#1 & 3)
						X		76.9±15.4% (n=12)	Hookers (#2)
				X				70.5±16.4% (n=24)	Locks (#4 & 5)
			X					69.3±18.5% (n=36)	Loose trio (#6, 7 & 8)
							X	77.8±15.2% (n=24)	Half backs (#9 & 10)
				X				71.0±12.5% (n=24)	Centres (#12 & 13)
		X						68.6±23.0% (n=36)	Back three (#11, 14 & 15)

Effect sizes (Cohen's d-value)						
Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
0.5**	0.4*	0.3	1.0**	0.6*	0.2	
		0.2	0.4*	0.1	0.4*	0.4*
			0.1	0.5*	0.0	0.1
				0.5*	0.1	0.0
					0.5*	0.5*
						0.1

Effect sizes: ** d = 0.8 (large); * d = 0.5 (moderate) and d = 0.2 (small)

The average goal directedness values of the hookers and half-backs respectively fell in the 60th and 65th percentile while that of the props fell in the 30th percentile. This meant that the props were significantly less goal directed than the half-backs and hookers (large effect sizes), and moderately less goal directed than the locks and centres. The half backs showed moderately higher goal directedness than the locks, loose trio, centres and back three. The hookers also showed large effect sizes for the comparison with the props, while moderate effect sizes were observed for their comparison with the loose trio, centres and back three.

Table 4. Descriptive statistics and comparisons between the different positional groupings for activation control.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x. Percentile.										Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
30%	35%	40%	45%	50%	55%	60%	65%	M ± SD	Positional groupings	Effect sizes (Cohen's d-value)						
	X							62.5±14.9% (n=24)	Props (#1 & 3)		0.7**	0.2	0.3	0.3	0.1	0.1
							X	72.7±14.4% (n=12)	Hookers (#2)			0.5*	0.4*	0.4*	0.6*	0.8**
X								59.9±17.1% (n=24)	Locks (#4 & 5)				0.4*	0.4*	0.2	0.1
				X				66.8±15.1% (n=36)	Loose trio (#6, 7 & 8)					0.0	0.2	0.4*
				X				66.9±15.2% (n=24)	Half backs (#9 & 10)						0.2	0.4*
		X						63.4±14.2% (n=24)	Centres (#12 & 13)							0.1
	X							61.4±14.1% (n=36)	Back three (#11, 14 & 15)							

Effect sizes: ** d = 0.8 (large); * d = 0.5 (moderate) and d = 0.2 (small)

On average the hookers clearly have the best activational control as they fell in the 65th percentile, while they also showed large or moderate practical differences with all of the remaining six positional groups. The locks, props, back three and centres (30th to 40th percentiles) struggled to control their activation levels, which further resulted in significant differences with the other three positional groups.

Table 5. Descriptive statistics and comparisons between the different positional groupings for maintaining self-confidence.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x. Percentile.									Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
35%	40%	45%	50%	55%	60%	M ± SD	Positional groupings	Effect sizes (Cohen's d-value)							
			X			69.6±18.7% (n=24)	Props (#1 & 3)		0.3	0.3	0.1	0.2	0.1	0.2
					X	75.0±18.2% (n=12)	Hookers (#2)			0.5*	0.2	0.1	0.3	0.6*
X						64.8±16.5% (n=24)	Locks (#4 & 5)				0.4*	0.5*	0.4*	0.1
				X		71.4±14.4% (n=36)	Loose trio (#6, 7 & 8)					0.1	0.0	0.4*
				X		73.2±14.1% (n=24)	Half backs (#9 & 10)						0.2	0.5*
			X			70.9±13.5% (n=24)	Centres (#12 & 13)							0.4*
	X					65.6±15.6% (n=36)	Back three (#11, 14 & 15)							

Effect sizes: * d = 0.5 (moderate) and d = 0.2 (small)

The hookers, loose trio and half-backs had reasonable self-confidence levels on average (average fell in the 60th and 55th percentiles), while the locks (35th percentile) and back three (40th percentile) had low self-confidence levels. The practically significant differences between the different groups were in the low to moderate range.

Table 6. Descriptive statistics and comparisons between the different positional groupings for concentration.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x. Percentile.										Positional groupings	Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
30%	35%	40%	45%	50%	55%	60%	65%	70%	M ± SD		Effect sizes (Cohen's d-value)						
						X			74.8±10.3% (n=24)	Props (#1 & 3)		0.3	0.5*	0.3	0.1	0.3	0.7 **
								X	78.5±11.8% (n=12)	Hookers (#2)			1.3 **	0.6*	0.4*	0.7 **	0.9 **
		X							68.1±13.8% (n=24)	Locks (#4 & 5)				0.2	0.4*	0.3	0.2
				X					70.9±12.7% (n=36)	Loose trio (#6, 7 & 8)					0.2	0.0	0.4*
					X				73.2±12.3% (n=24)	Half backs (#9 & 10)						0.2	0.6*
					X				71.4±9.6% (n=24)	Centres (#12 & 13)							0.5*
X									64.9±15.5% (n=36)	Back three (#11, 14 & 15)							

Effect sizes: ** d = 0.8 (large); * d = 0.5 (moderate) and d = 0.2 (small)

The hookers had on average the best concentration levels (70th percentile), while the back three showed poor concentration levels on average (30th percentile). Hence, the hookers had moderate or large practically significant differences with all of the positional groups, except the props. The back three tested significantly worse than all of the positional groups except for the locks.

Table 7. Descriptive statistics and comparisons between the different positional groupings for mental rehearsal.

The data from the total subject group (N=180) were used to determine every 5th percentile for this specific sport psychological skill. The specific percentile in which the average value of a particular group fell is indicated with an x. Percentile.							Positional groupings	Props (#1 & 3)	Hookers (#2)	Locks (#4 & 5)	Loose trio (#6, 7 & 8)	Half backs (#9 & 10)	Centres (#12 & 13)	Back three (#11, 14 & 15)
40%	45%	50%	55%	60%	65%	M ± SD		Effect sizes (Cohen's d-value)						
X						59.8±16.9% (n=24)	Props (#1 & 3)		0.2	0.1	0.3	0.8**	0.0	0.0
		X				63.8±18.8% (n=12)	Hookers (#2)			0.0	0.1	0.5*	0.2	0.2
	X					61.5±14.7% (n=24)	Locks (#4 & 5)				0.2	0.7**	0.1	0.1
			X			64.2±14.2% (n=36)	Loose trio (#6, 7 & 8)					0.5*	0.3	0.3
					X	70.4±10.8% (n=24)	Half backs (#9 & 10)						0.7**	0.7**
X						60.0±16.7% (n=24)	Centres (#12 & 13)							0.0
X						60.2±15.6% (n=36)	Back three (#11, 14 & 15)							

Effect sizes: ** d = 0.8 (large); * d = 0.5 (moderate) and d = 0.2 (small)

The use of mental rehearsal seems to be a strength among the half-backs, while the average values of props, locks, centres and back three all fell below the 50th percentile range. Moderate or large practically significant differences were eminent between the half-backs and all six other positional groups.

Discussion

From the 147 inter-positional group comparisons, small practical differences were reported 81 times, moderate practical difference occurred between 46 group comparisons, while in 20 cases, large practical differences were shown. It is, therefore, not possible to discuss all these differences, yet an attempt will be made to discuss certain results by comparing it to current literature.

The half-backs showed significantly greater achievement motivation than all the other positional groups. A possible explanation might be found from Erculj and Vicic's (2001) study on basketball players. These researchers reported that the forwards and guards had stronger motivational dimensions than the centres. These positions are central to either scoring or preventing the opposition from scoring. Similarly, the half-backs (especially the fly-halves) who are regarded as the play-makers in the team, have to dictate and dominate the match proceedings and are pivotal in scoring points through drop-goals, penalties and conversions, which often determine the match outcome. Position specific roles, especially those relating to the scoring of points might, therefore, be closely related to achievement motivation values and contribute to the observed practically significant positional differences.

No clear positional patterns were eminent for goal directedness. The observation that both half-backs and hookers were largely more goal directed than the props might also be due to differences in specific positional responsibilities. The props (who tested worse in this skill) are primarily responsible for scrumming and supportive play, while hookers and the half-backs have various important roles to play. The hookers for example have to organise line-outs, find the jumpers and be active in the loose play, while the half-backs are faced with numerous tasks, often related to the final outcome of the match. It is difficult to discuss the emerging activation control results which show that the hookers are significantly better than the other positions at controlling their tension during matches as well as holding positive expectations during matches, as there are no previous research findings to compare is to.

Self-efficacy (a situation-specific form of self-confidence) theory is associated with performance accomplishments (Weinberg & Gould, 2003). As a result, repeated failures in specific game situations could lead to losses of self-confidence. From the results it is clear that the locks and back three have on average the lowest levels of self-confidence. A possible explanation for this might once again be found in the primary roles these players fulfil. In the case of the back three, their short intense work durations, followed by extended rest periods (Duthie, Pyne & Hooper, 2005) might have an adverse effect on self-confidence as they will have more time to ponder on past mistakes and possibly on negative future expectancies. The same reason (less active involvement in the match activities making them more prone to be disrupted) might be responsible for the significantly weaker concentration levels of the back three (less active involvement in the match activities). In contrast to earlier findings by Maynard and Howe (1989) and Duthie et al. (2005) that half-backs had the best broad external focus, these results show that the hookers and props had better concentration levels than the half-backs. However, it should be noted that the PSI used in the current study measures general concentration, whereas Maynard and Howe (1989) used the test of

attentional and interpersonal styles (TAIS), which measures specific attentional dimensions. Not surprisingly, the half-backs' mental rehearsal values were significantly greater than all the other positions. The goal-kicking responsibilities mainly befall the fly-half and Jackson (2003) found consistent mental rehearsal strategies during the pre-performance routine for goal kicking. The latter result was, therefore, to be expected.

The results of this study support the notion that a relationship exists between sport psychological skills and playing position in rugby union. More specifically, evidence suggests that rugby players can be differentiated as a function of their psychological skill levels and their playing position. Coaches should, however, not use psychometric test results to determine playing position. Physique, strength, speed and technical abilities should remain the primary selection criteria for a playing position, while psychological skills should be developed once a player has been chosen for a specific position in a team (Cox & Yoo, 1995).

Overall, these results indicate relatively poor sport psychological skill levels in the tested group. It is clear that the hookers and half-backs consistently performed best in the seven sport psychological skills, while the average values of the props, locks and back three frequently fell in the lowest percentile ranges. These results emphasize the need for psychological skills training (PST) programmes aimed at improving any deficiencies.

While general positional performance profiles appear to exist, intra-positional differences may also occur due to variations in an individuals' own sport psychological skills profile. PST programmes should, therefore, consider the results of the individual. However, the results of this study may warrant the development and implementation of specifically modified PST sessions for the different positional groups. Potential benefits of such position specific PST programmes are role-specific examples and scenarios, smaller group sizes (which should add to the effectiveness of PST sessions) and the possibility that players in similar positions could relate better to each others' strengths, weaknesses, problems and needs. It is recommended that a position specific PST programme be developed, implemented and the effectiveness thereof researched.

Extreme caution should be applied when generalizing the results of this study to all u/19 rugby union players. The participants used in this study are by no means a representative sample of all South African u/19 players. Rather, the sample consisted of players from one club, who was consistently ranked as one of the top two clubs in South Africa over the 2003-2005 rugby seasons. It could be of interest to repeat a study of this nature on this topic with other groups of players (different participation levels/other regions/sports etc.). Bigger sample sizes are also suggested.

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4 Summary, Conclusions, Shortcomings And Recommendations

4.1 SUMMARY

The objective of this study was firstly to determine the sport psychological skill levels and related psychosocial factors that distinguish between rugby union players from different participation levels. The second objective was to compare players in different positional groups regarding their sport psychological skill levels. Chapter 1 provided a brief outline of the problem statement that underlies the research questions as well as purposes and hypotheses that form the basis of this study.

Chapter 2 consists of a research article entitled "Sport psychological skill levels and related psychosocial factors that distinguish between rugby union players of different participation levels", by Andrew, M., Grobbelaar, H.W. and Potgieter, J.C. This article will be presented for publication in the *South African Journal for Research in Sport, Physical Education and Recreation*. This article reported on the prior exposure to sport psychological skills training programmes (SPSTP), the perceived importance, ability and need for SPSTP among a group of 120 u/19 club rugby players. It also indicated certain psychosocial factors and sport psychological skills that could distinguish between u/19 club rugby players of different participation levels.

Chapter 3 consists of a research article entitled "Positional differences in the sport psychological skill levels of rugby union players", by Andrew, M., Grobbelaar, H.W. and Potgieter, J.C. This article will be presented for publication in *The Sport Psychologist*. This article reported on practically significant differences between seven positional groups for seven sport psychological skills among a group of 180 u/19 rugby union players.

Both of the afore-mentioned articles are included according to the guidelines of the specific journals and consist of an introduction, problem statement, resulting research questions and study purposes.

The research methods (participants, instruments, measurement procedure and statistical analysis) are described, after which the results are presented and discussed. Each article concludes with research conclusions and recommendation.

4.2 CONCLUSIONS

The following section deals with the conclusions which are drawn from the hypotheses that were set in Chapter 1.

4.2.1 Hypothesis 1: The players' prior exposure to sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels.

This hypothesis is rejected due to very small differences between the top and lower ranked players regarding previous consultations with sport psychologists (individuals or during team sessions) . Apart from reaching the set objective, the results also indicate an overall lack of previous exposure to sport psychological skills training programmes.

4.2.2 Hypothesis 2: The players' perceived importance of sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels.

This hypothesis is accepted based on slight differences regarding the perceived importance of sport psychological skills training programmes. In general top ranked players perceive sport psychological skills training programmes as more important than their lower ranked counterparts. The results also indicate a high perceived importance of such programmes.

4.2.3 Hypothesis 3: The players' perceived ability to be psychologically well prepared for competitions will distinguish between u/19 club rugby players of different participation levels.

This hypothesis is accepted based on considerable differences regarding the top and lower ranked players' perceived ability to be psychologically well prepared for competitions. The results also outlined shortcomings with regard to psychological preparation.

4.2.4 Hypothesis 4: The players' expressed need for sport psychological skills training programmes will distinguish between u/19 club rugby players of different participation levels.

This hypothesis is accepted, due to the fact that the top ranked players expressed a higher need for sport psychological skills training programmes. The overall need of these players is reason enough for developing and implementing sport psychological skills training programmes for the group in question.

4.2.5 Hyposthesis 5: The sport psychological skill levels and related psychosocial factors of the players will distinguish between u/19 club rugby players of different participation levels.

This hypothesis is accepted, since moderate practically significant differences were observed for seven psychosocial and reaction to change factors. Also, self-confidence, personal coping resources, coping with adversity, average psychological skills and activation control can distinguish between top and lower ranked rugby players, with the top ranked players outscoring the lower ranked players in all of the above skills.

4.2.6 Hypothesis 6: Positional differences will exist regarding the sport psychological skill levels of u/19 club rugby players.

This hypothesis is accepted based on practically significant positional differences regarding sport psychological skill levels for 66 of the 147 inter-positional comparisons.

The results of this study, therefore, unequivocally show that u/19 rugby players of different participation levels can be distinguished based on prior exposure, perceived importance, ability and need for sport psychological skills training programmes, psychosocial factors and sport psychological skill levels. Also, positional differences exist regarding the sport psychological skill levels of rugby union players.

4.2 SHORTCOMINGS AND RECOMMENDATIONS

Certain shortcomings regarding this study can, however, be indicated:

- ✓ The players were not randomly selected to participate in this study from a larger population pool. Caution should, therefore, be applied when generalizing the results to u/19 rugby union players in general. Future studies should include greater representation from club rugby players in South Africa.

- ✓ The groups also consisted of only a small number of players (especially the different positional groups) and could in fact change the results. It could be worth while to implement another two years of data into the study. The reasonably small sample size (especially when broken down into the various positional groups) is a shortcoming which should be addressed in future studies.

- ✓ Other psychosocial factors such as communication skills, group interaction and team dynamics should be included and measured through valid and reliable questionnaires.

The following recommendations are made from the results of the present study:

- ✓ From the results it is clear that sport psychological skills should be developed by means of consistent, systematic sport psychological skills training programmes. The effectiveness of such a programme should also be developed further.

Two further research projects are proposed from the results in the present study:

- ✓ By expanding the sample size (gathering the same data during another two to three seasons) the two articles in this study can be combined, i.e. comparing the sport psychological skill levels of top and lower ranked rugby players per position.

- ✓ It is suggested that position specific sport psychological skills training programmes be developed and implemented. The effectiveness of such programmes should be followed and compared to traditional sport psychological skills training methods.

The systematic and consistent SPSTP currently implemented by the PRI (three part time sport psychology consultants working with the u/19, u/21 and senior squad respectively) bodes well for the psychological development of the PRI players and the performances of the PRI teams. Since universities are seen as the breeding ground for "tomorrow's stars", the sport scientific approach of the PRI holds great potential for South African rugby as a whole.

SOUTH AFRICAN JOURNAL FOR RESEARCH IN SPORT, PHYSICAL EDUCATION AND RECREATION

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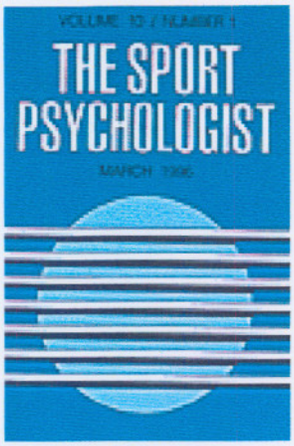

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APPENDIX C: GENERAL QUESTIONNAIRE, CSAI-2, ACSI-28 AND PSI

- ✓ Informed consent form
- ✓ Biographical Questionnaire
  - ⏩ Section A: Demographic information
  - ⏩ Section B: Rugby history
  - ⏩ Section C: Sport psychology background
  - ⏩ Section D: General psychosocial factors and circumstances influencing participation and performance in rugby
  - ⏩ Section E: Reaction to change
- ✓ Competitive State Anxiety Inventory-2 (CSAI-2) (Martens *et al.*, 1990)
- ✓ Psychological Skills Inventory (PSI) (Wheaton, 1998)
- ✓ Athletic Coping Skills Inventory-28 (ACSI-28) (Smith *et al.*, 1995)

INFORMED CONSENT FORM:

PROJECT: Sport Psychological Skills of u/19 Rugby Players from the PUK Rugby Institute

(REFERENCE NUMBER: 058K13)

I, _____ hereby declare that the person taking the test has informed me:

- ❑ About the nature of the testing
- ❑ About the purpose thereof
- ❑ That all data will be dealt with confidentially (No individual results will be made public to any other person)
- ❑ That I will receive an individual report on the results
- ❑ That I am free to refuse completing the questionnaires (or any questions thereof)

I further give consent that the results may be used for the following purposes (Please mark each of the applicable responses with an X):

1	Compiling of the individual results	
2	Compiling of the results for the whole tested group (or in teams), with anonymity guaranteed	
3	For the purpose of research (anonymity guaranteed)	

Signed in Potchefstroom,

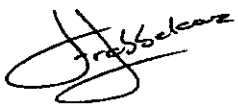
On this the ___ day of _____ 200__

_____

Players' signature

_____

Team coach



Research Project Leader

PUK RUGBY INSTITUTE

BIOGRAPHICAL QUESTIONNAIRE

Name and surname: _____

Section A: Demographic information (Please cross out the relevant answer)

1	**Record number (for office use)**							
2	**Birth date:**	19	*y*	*y*	*m*	*m*	*d*	*d*
3	**In which u/19 squad do you think you'll be when the squads are announced?**					**u/19 A**		1
						u/19 B		2
						u/19 C		3
4	**Position (Give numbers in preferred order)**							
5	**Race (for statistical purposes)**					**White**		1
						Coloured		2
						Asian		3
						Black		4
6	**What do you study?**							

Section B: Rugby History (Please cross out the relevant answer)

7	**How old were you when you started playing rugby?**			yr
8	**In which high school did you matriculate?**			
9	**For how many years did you play rugby at high school?**			yr
10	**What was your highest representative level of rugby during your u/18 year?**	**2nd team**		1
		1st team		2
		Provincial: Merit/ Academy team		3
		Provincial: Craventweek		4
		SA Academy		5
		SA Schools		6
		Other (indicate) _____ _____		7
11	**For which period of time during your rugby career could you not participate due to injuries?**			**Months**

Section C: Sport psychology background (Please cross out the relevant answer)			
12	Have you ever consulted a sport psychologist individually or been part of a team who followed a sport psychological skills training programme developed and implemented by a sport psychologist?	Yes	1
		No	2
13	If so, what is/was the frequency of these visits/ consultations?	Once of	1
		Weekly	2
		Monthly	3
		6-monthly	4
		Yearly	5
		No fixed pattern	6
14	What is your opinion on sport psychology?	Very important	1
		Important	2
		Neutral (Uncertain)	3
		It can help, but it's not important	4
		It is a waste of time	5
15	To what extent are you able to prepare yourself optimally for competitions?	Very good	1
		Good	2
		Average	3
		Below Average	4
		Poor	5
16	To what degree do you have a need to consult a sport psychologist or take part in psychological skills development sessions?	Have a great need	1
		Have a need	2
		Neutral (Uncertain)	3
		Have no need	4
17	Please complete the following: To be optimally prepared psychologically this season, I would like to …		

Section D: General psychosocial factors influencing participation and performance in rugby

(Please cross out the relevant answer)

18 - 32	**Indicate to what extent each of the below mentioned aspects influence your participation and performance in rugby.**					
		Great negative influence	**Negative influence**	**Neutral**	**Positive influence**	**Great positive influence**
	Effect of Family/ personal life	1	2	3	4	5
	Effect of Team members/ Team spirit	1	2	3	4	5
	Effect of Coaches	1	2	3	4	5
	Effect of Referees	1	2	3	4	5
	Effect of Spectators	1	2	3	4	5
	Effect of Home games	1	2	3	4	5
	Effect of Away games	1	2	3	4	5
	Effect of Financial aspects	1	2	3	4	5
	Thoughts about what the future has in stall for you	1	2	3	4	5
	Academic pressure experienced	1	2	3	4	5
	The effect of the score board	1	2	3	4	5
	Possibility of a career ending injuries	1	2	3	4	5
	Thoughts about losing my place in the team to another player	1	2	3	4	5
	Thoughts about losing your place in the team to a quota player	1	2	3	4	5
	The perceived effect of the quota system on own performance	1	2	3	4	5

Section E: Reaction to change (Please cross out the relevant answer)

33 - 43	Indicate to what extent you agree/ disagree with the following statements					
		Fully Agree	Agree	Neutral	Disagree	Fully disagree
	In general I adapt to new circumstances with difficulty	1	2	3	4	5
	I adapt with difficulty to new coaches	1	2	3	4	5
	I adapt with difficulty to new game plans	1	2	3	4	5
	I don't easily become part of a new team	1	2	3	4	5
	I think it is difficult to achieve a good team spirit with so many new team mates	1	2	3	4	5
44	What has been the most difficult change, rugby wise you had to make in this year?					
45	What has otherwise been the most difficult change you had to make during this year?					
46	Indicate which aspect(s) of Section E you would like to have addressed during the psychological skills training sessions					

Competitive State Anxiety Inventory-2 [CSAI-2] (Martens *et al.*, 1990)

DIRECTIONS: A number of statements that sport competitors have used to describe their feelings before competitions are given below. The questionnaire is divided into two sections. Read each statement and then circle the appropriate number to the right of the statement of the scale from 1 to 4 to indicate how you felt 5 minutes before the most important competition you have ever competed in. There are no right or wrong answers. Do not spend too much time on any one statement.

	Not al all	Some what	Moderately so	Very much so
1. I am concerned about this competition.	1	2	3	4
2. I feel nervous.	1	2	3	4
3. I feel at ease.	1	2	3	4
4. I have self-doubts.	1	2	3	4
5. I feel jittery.	1	2	3	4
6. I feel comfortable.	1	2	3	4
7. I am concerned that I may not do as well in this competition as I could.	1	2	3	4
8. My body feels tense.	1	2	3	4
9. I feel self-confident.	1	2	3	4
10. I am concerned about losing.	1	2	3	4
11. I feel tense in my stomach.	1	2	3	4
12. I feel secure.	1	2	3	4
13. I am concerned about choking under pressure.	1	2	3	4
14. My body feels relaxed.	1	2	3	4
15. I am confident I can meet the challenge.	1	2	3	4
16. I'm concerned about performing poorly.	1	2	3	4
17. My heart is racing.	1	2	3	4
18. I am confident about performing well.	1	2	3	4
19. I am worried about reaching my goal.	1	2	3	4
20. I feel my stomach sinking.	1	2	3	4
21. I feel mentally relaxed.	1	2	3	4
22. I'm concerned that others will be disappointed with my performance.	1	2	3	4
23. My hands are clammy.	1	2	3	4
24. I feel confident, because I mentally picture myself reaching my goal.	1	2	3	4
25. I'm concerned I won't be able to concentrate.	1	2	3	4
26. My body feels tight.	1	2	3	4
27. I'm confident of coming through under pressure.	1	2	3	4

Athletic Coping Skills Inventory-28 [ACSI-28] (Smith *et al.*, 1995)

Below you'll find a few statements athletes' use to describe their sporting experiences. Read through each of these statements and recall how often you experience the same aspects. It is important that you answer each question as truthfully as possible. False or inaccurate answers will indicate the wrong coaching methods for you. There are no right or wrong answers, so don't spend too much time on any one answer. Cross out the one answer that is most applicable to you.

1. On a daily or weekly basis, I set very specific goals for myself that guide what I do.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

2. I get the most out of my talent and skills.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

3. When a coach or manager tells me how to correct a mistake I've made, I tend to take it personally and feel upset.

   ☐ Almost never ■ Sometimes ☐ Often ■ Almost always

4. When I am playing sports, I can focus my attention and block out distractions.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

5. I remain positive and enthusiastic during competition, no matter how badly things are going.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

6. I tend to play better under pressure because I think more clearly.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

7. I worry quite a bit about what others think about my performance.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

8. I tend to do lots of planning about how to reach my goals.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

9. I feel confident that I will play well.

   ☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

10. When a coach or manager criticizes me, I become upset rather than helped.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

11. It is easy for me to keep distracting thoughts from interfering with something I am watching or listening to.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

12. I put a lot of pressure on myself by worrying how I will perform.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

13. I set my own performance goals for each practice.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

14. I don't have to be pushed to practice or play hard; I give 100%.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

15. If a coach criticizes or yells at me, I correct the mistake without getting upset about it.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

16. I handle unexpected situations in my sport very well.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

17. When things are going badly, I tell myself to keep calm, and this works for me.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

18. The more pressure there is during a game, the more I enjoy it.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

19. While competing, I worry about making mistakes or failing to come through.

☐ Almost never ■ Sometimes ☐ Often ☐ Almost always

20. I have my own game plan worked out in my head long before the game begins.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

21. When I feel myself getting too tense, I can quickly relax my body and calm myself.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

22. To me, pressure situations are challenges that I welcome.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

23. I think about and imagine what will happen if I fail or screw up.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

24. I maintain emotional control no matter how things are going for me.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

25. It is easy for me to direct my attention and focus on a single object or person.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

26. When I fail to reach my goals, it makes me try even harder.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

27. I improve my skills by listening carefully to advice and instruction from coaches and managers.

☐ Almost never ☐ Sometimes ☐ Often ☐ Almost always

28. I make fewer mistakes when the pressure is on because I concentrate better.

■ Almost never ☐ Sometimes ☐ Often ☐ Almost always

Psychological Skills Inventory [PSI] (Wheaton, 1998)

In order for you to get some use from this questionnaire it is important that you respond to the statements as honestly as possible. Information provided by you is confidential and will not be available to any person other than yourself and the sport psychologist.

- ⇨ This questionnaire consists of a number of statements about the experience of competitive sport.
- ⇨ Read each statement carefully then indicate how it applies to you when you compete in important competitions.
- ⇨ There are no correct or incorrect answers. All you are required to do is to consider each statement in terms of your own sporting experience.

1. I can persevere at my sport, even when I am very tired.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

2. I set goals for my sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

3. Before I compete in important competitions I worry about not performing well.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

4. If I lose confidence during a competition I know how to recover it.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

5. I use fixed routines of rituals before competitions.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

6. I set aside specific times to practise my sport in my imagination (visualisation/imagery).

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

7. If the odds are against winning, I am still able to produce my best effort.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

8. On a daily or weekly basis I set very specific goals for myself that guide what I do.

☐ Never ☐ Rarely ■ Sometimes ■ Often ■ Always

9. I worry about making mistakes in important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

10. I feel threatened by important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

11. During a competition I continue to concentrate well even after making a mistake.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

12. I can clearly visualise my future sport performances in my imagination.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

13. If I get behind in a competition, I feel that winning is impossible.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ■ Always

14. I set realistic, but challenging goals for my sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

15. The more important the competition, the more enjoyable it is for me.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

16. Before important competitions I am confident that I can handle the pressure.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

17. I have trouble concentrating during important competitions.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

18. I find it difficult to visualise clear mental pictures of my sport in my imagination.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

19. I am able to bounce back quickly after a disappointing performance.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

20. I write down my foals for my sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

21. I enjoy the challenges of important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

22. I experience thoughts of failure during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

23. When unexpected things happen during important competitions it disrupts my concentration.

☐ Never ■ Rarely ☐ Sometimes ■ Often ■ Always

24. I visualise my sport in my imagination during practice sessions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

25. I strive for better performances.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

26. I monitor the progress towards my goals.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

27. I can control my nervousness before important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

28. Before important competitions I am confident that I can meet the challenges.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

29. My concentration lets me down during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ☐ Always

30. I visualise my sport in my imagination during competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

31. I am good at motivating myself.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

32. I set specific goals for each practice session.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

33. I can handle the unexpected stress during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

34. I have doubts about my ability in sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

35. My thoughts interfere with my performance during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

36. I visualise my sport in my imagination just before going into important competitions.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

37. I am motivated to excel in my sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ■ Always

38. I set specific goals for every competition.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ■ Always

39. I worry about failing in important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

40. My confidence tends to drop as an important competition draws nearer.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

41. I can effectively block out negative thoughts during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

42. I visualise dealing with setbacks and coping with difficult situations in my sport.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

43. I look forward to important competitions.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ☐ Always

44. My specific goals are structured to lead me to my eventual long-term goal.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

45. I know how to make myself relax in difficult situations.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

46. When I begin to perform poorly, my confidence drops quickly.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

47. Negative remarks by other people (such as spectators or opponents) upset me during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

48. I use visualisation in the period just before the beginning of a competition.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

49. I am a tough competitor.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

50. My goals all have deadlines attached to them.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

51. When I make a mistake during important competitions I become nervous.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ☐ Always

52. Before an important competition I am concerned that I may not do as well as I could.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

53. I can quickly refocus my concentration after becoming distracted during important competitions.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ☐ Always

54. When I mentally practise my performance, I try to imagine what it will feel like in my muscles.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

55. I am enthusiastic at practise sessions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

56. I, myself, set my goals for my sport.

☐ Never ☐ Rarely ☐ Sometimes ■ Often ☐ Always

57. I am concerned that others will be disappointed with my performance in important competitions.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

58. Before important competitions I am confident that I will perform well.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ■ Always

59. When a competition is not going well, my concentration is easily distracted.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

60. I can clearly visualise my previous sport performances in my imagination.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

61. I enjoy training with others.

☐ Never ■ Rarely ☐ Sometimes ☐ Often ☐ Always

62. I worry about the rest of the team to such an extent that it affects my performance.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

63. I have enough time to function efficiently in all areas of my life (sport, studies, word, social life, etc.).

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always

64. My family and friends support me in my sport.

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Always