

CHAPTER NINE

CONCLUSIONS AND RECOMMENDATIONS

9.1 INTRODUCTION

Throughout the course of this study, the primary aims leading this study were noted. The first aim is to conduct an in-depth and exhaustive review of the literature so as to provide a sufficient foundation and basis for this study. The second main aim is to provide an alternative sport and position-specific testing protocol as well as comparative results consisting of norms and scores that will adequately identify and select those capable of participating in elite age-group rugby union. Furthermore, the hypothesis noted in chapter one is as follows: the findings of this study will contribute meaningfully to elite rugby union by providing sport and position specific test protocols as well as norms and standards for comparison.

The discussion contained in this chapter will therefore focus on these two main aims as well as the hypothesis. After every chapter conclusions and recommendations were provided in the summary section and these can serve as extra references in this regard.

9.1.1 Chapter outline

Section one: conclusions and recommendations from literature

In this section the pre-existing conclusions and recommendations established earlier from the in-depth and exhaustive literature review are re-evaluated, and where appropriate extra conclusions and recommendations are formulated.

Section two: conclusions and recommendations from the empirical investigation

In this section conclusions and recommendations from the empirical investigation will be formulated.

Section three: conclusions and recommendations regarding study hypothesis

In this section an evaluation of the hypothesis of this study in relation to the literature and the empirical investigation is provided.

9.2 CONCLUSIONS AND RECOMMENDATIONS FROM LITERATURE

9.2.1 Terms and concepts

It is concluded that the terms and concepts applicable to talent identification and expert performance need further clarification. While the terms identification, detection, selection and development as these pertain to talent are on the whole self explanatory, or perhaps *more readily* explained and thus understood, the issue surrounding the concept of talent per se is still greatly debated, with extensive argument emanating from the literature. In fact, the concept of expert performance itself can be seen to be affected by the same arguments that rage around the concept of talent and talented performance. In many instances, while the differences in perspective between expert performance and talented performance can be regarded as being a case of mere semantics, these differences can be seen as being the result of the unresolved nature versus nurture debate and related issues.

There is very little consensus and, the truth be told, there probably never will be. This in itself is not a bad thing, but what this debate has caused, or rather prevented, is the development of an all-encompassing model of talent (and expert performance) that satisfies all parties. In chapter two, certain sections of Gagné's (1985; 2003; 2005) Differentiated Model of Giftedness and Talent (DMGT) in Van Rossum and Gagné (2005) were examined. The adoption of this model to serve as a framework for further research and investigation, as proposed by Vaeyens *et al.* (submitted), is certainly a viable and worthy consideration and is, for the purposes of this section, recommended. It could perhaps be seen as a starting point in bringing the divergent views of all parties together, at least partly. This recommendation also serves true for the later discussion regarding the nature/nurture issue.

9.2.2 Sport and rugby

Sport is an ever-evolving practice and none more so than rugby. This evolution was described at length in chapter three. Rugby is still evolving regarding the rules of and the approach to the game. This is being done for the sole purpose of making the game more attractive to the masses and is another example of the on-going commercialisation of the “product” called rugby. This has the potential of affecting the ethos of the game. The question needs to be asked: is it a bad thing? How long ago was professional rugby, or any competitive sport for that matter, played solely for “the love of it?”

Probably the biggest catalyst for change was the professionalisation of the game after the 1995 IRB World Cup (Treasure *et al.*, 2000; Garraway *et al.*, 2000; Hattingh, 2003; Van Gent, 2003; Quarrie & Hopkins, 2007) with the effects resonating to this day. From the evidence gained from the literature and from the press, it is concluded that rugby will for a while still be an evolving game, until such a time as a balance can be struck between what appeals and what is meaningful. What can be concluded from this, however, is that there is certainly an increased focus on talent identification and development in rugby since 1995, especially in South Africa (see all the rugby-related talent identification references in this regard), with this increase being for the purpose of ensuring sustained success on the international front through the identification and subsequent development of talented players. No recommendations can be proffered regarding the evolution of rugby, since any recommendations proposed would fall outside the scope of this study.

9.2.3 Physical perspectives

It was noted in chapter three that mental, sport-specific, physical and tactical attributes and skills are needed for success in rugby (Quarrie & Wilson, 2000; Hale & Collins, 2002; Luger & Pook, 2004; Durandt *et al.*, 2006; Duthie, 2006) and that in the last century, and in particular the last twenty five to thirty five years, substantial increases have been observed in the sizes of physiques of rugby players (Olds, 2001; Luger & Pook, 2004; Quarrie & Hopkins, 2007).

Subsequently, in chapter four the analyses of the physical requirements that Duthie (2006) and others provided were reviewed. This also included sport-specific skill. Investigating the sport-specific skill aspect in rugby is also not a new thing, with Pienaar and Spamer (1995) in Pienaar and Spamer (1998) being the first to do so. Since rugby is a collision sport (Hattingh, 2003; Gabbett & Domrow, in press) that places great physical requirements upon the participants, the physical aspects predominate more in this sport than certain others, and it is concluded that the physical aspects of the game will receive even greater consideration in the future as the game continues to evolve. This places even more pressure on talent identification researchers and proponents to monitor this progression and to provide as up-to-date prediction functions and further norms and standards for comparison as possible.

Concern over this is unfounded however, considering the literature emanating from a South African context in this regard. Furthermore, any recommendations in this regard are superfluous, considering the steady flow of research into talent identification and development as this pertains to rugby. Obviously, this is not as voluminous as it could be, but it is certainly the predominant sport under investigation.

Maturation and growth considerations continue to predominate in talent identification and expert performance literature, and for good reason. The relative rate of maturation has a profound effect on individuals at childhood or adolescent level. Early maturation is certainly a consideration and it has been recommended by some (Hahn & Gross, 1990) that results be compared specifically to biological age as opposed to chronological age, since late maturers tend to be at a disadvantage when compared to chronological, age based norms and standards (Vaeyens *et al.*, submitted). Biological age considerations from a South African perspective were also raised some time ago by du Randt and Headley (1992c).

The relative-age effect is well documented (see chapter six) and has also been researched within the South African context, with confirmatory results (Spamer & Winsley, 2003b) found. Those indicating a relative-age effect tend to be advantaged in selection and subsequent development (Musch & Grondin, 2001; Vaeyens *et al.*, 2005a; Côté *et al.*, 2007; Medic *et al.*, in press; Vaeyens *et al.*, submitted).

It is concluded that while maturation, growth and the relative-age effects are issues that are proven to exist, not much can constructively be done about them. Sport is by its nature a selective endeavour, and physically so. It is vital that talent identification acknowledges these issues, however, and that talent development be implemented to address these issues. Through the process of talent development these late bloomers can be brought up to standard, albeit at a later stage. What talent development can serve to do, further, is to develop the inherent skills specific to the sport under consideration, so that when the rate of maturation of the late-bloomers reaches those of the early maturers, as it inevitably does (Philippaerts *et al.*, 2006; Vaeyens *et al.*, submitted), there are no further backlogs. This also serves as a recommendation of this study.

9.2.3.1 Nature versus nurture

The issue of genetics, heredity and heritability have also been discussed at length in chapter four. The general heritability estimates of a number of motor, physical and physiological abilities and attributes were provided. Some of these were then subsequently countered in the rebuttal section of the chapter. After that, the role of the family and significant others within the context of talent and its development was reviewed. It is challenging to provide either conclusions or recommendations in this regard, since the nature-nurture argument is an unresolved matter that has been raging on for well over a century.

The specific conclusion of this study, however, is contained in the view that this study adopts on this matter, i.e.: that is that there both are genetic and environmental factors that play a role in talent and its subsequent development.

Therefore, the genetic potential of the individual will only be achieved through exhaustive and continued interaction with the environment, and this interaction has to be specific, targeted and sustained. The role of the parents and significant others in this regard are critical and should *never* be disregarded. As was shown, the role of parents in the lives and the development of well-balanced and talented individuals are non-negotiable. The role of the coach and peers are also important determinants and these should be fostered at all costs.

Specific recommendations of this study are that while research abounds regarding the role of parents and even coaches, perhaps more research needs to be aimed at investigating the specific role that the peer group plays in the process of developing talent and the child as a whole, since research on this issue is admittedly scarce (see chapter four). It was noted that some peer relationships are at best tenuous during adolescence and these could certainly have an impact on sustained sport participation if peer influence is the overriding consideration and motivation for practice and participation.

Also, further historical and current talent and expertise developmental models were presented in chapter four. Ranging from the ground breaking research of Bloom (1985) and progressing through to the equally seminal works of Ericsson *et al.* (1993), Côté (1999), Côté *et al.* (2007) and finally Button and Abbott (2007), these works have all provided outlooks on talent development that can be lauded more for what they have in common as opposed to where they differ. These models were in fact included for this reason. These works portray the general thinking of talent development, as do the specific approaches to talent development that were provided in chapter six.

The specific conclusions of this study pertaining to these models and talent (expertise) development is that they are all applicable and that there is very little difference between them. The specific preference of this study, however, is the model of Button and Abbott (2007). This model can be seen as being particularly

relevant to *both* talent identification and development due to the fact that it has been included as a facilitating aspect in earlier attempts (Abbott & Collins, 2004; Abbott *et al.*, 2005) at combining talent identification and development into one, all encompassing model. This specific version of the model was included in this study for its recent and contemporary perspective on the development of talent.

For a further summary and some associated conclusions and recommendations please consult section 4.5 of chapter four. In this section also note the more recent research concerning the *birth-place* effect in talent development.

9.2.4 Psychological perspectives

A strong case was made for psychological considerations in talent identification and even development. From the literature it is clear that certain attributes such as motivation, commitment and practice are indeed needed to achieve elite status in sport. A specific construct, namely mental toughness, was reviewed. This is an all-encompassing construct that deals with the more traditional considerations such as anxiety, fear and even motivation but also, further, describes the individual's mental preparedness and ability to cope with pressure and the demands that elite sport place on an individual.

This study proposed earlier, and is currently reiterating this proposal again that the Elite Athlete Development Model of Cooper and Goodenough (2007) be the model of choice for talent identification and development. This is also the final conclusion of this study regarding the concept of mental toughness and its measurement and identification. This study recommends that appropriate steps be taken to incorporate this model within the structures of SA Rugby and the provincial unions country wide. If a certain amount of sentiment can be allowed at this time, then the following can be ventured: South Africa is widely regarded as having the highest number of talented rugby players (largest talent pool) of all the rugby playing countries in the world. Furthermore, South Africa's players are regarded of the best in the world, with their recent crowning as two time world champions confirming this.

In putting patriotism to one side though, it must unfortunately be honestly acknowledged that in the not too distant past the results have not always reflected this supposed superiority. While a small proportion of the blame can be attributed to the physical preparedness of the players (although currently this has been adequately addressed), and largest and probably overriding proportion of this can be attributed to mental preparation and, to a lesser yet still important extent, the rugby-specific skills. These issues need to be addressed and the recommendations made throughout this study in this regard apply forthwith.

It has been suggested by some that the only significant differences between individuals in homogenous groupings such as elite athletes can be attributed to psychological differences. The afore-mentioned mental toughness construct is one possible explanation for the differences between those who consistently succeed at elite level, and those who do not.

Other psychological considerations in this regard are those of perceptual-cognitive and perceptual-motor skills inherent to sport. These are valid considerations and ones that have in fact been studied and addressed for decades, with particular interest emanating from the cognitive proponents of expert performance. It can be said unequivocally that this study supports the view underlying the importance of perceptual-cognitive and perceptual-motor skills and abilities and this therefore serves as the conclusion in this regard.

This study successfully incorporated a sport vision test that partly addresses these issues, but it is a recommendation of this study that further in-depth research and evaluation be done of perceptual cognitive, motor and sport vision ability in rugby and in general. There are individuals in South Africa who are currently contributing to this area (Dr. Sherylle Calder), but there is certainly a need for more participation and analysis in this regard.

9.2.5 Talent identification

Talent identification is the central theme of this study. The historical development and progress of talent identification and development worldwide and in South Africa was reported in chapter six. Stemming from this analysis, this study greatly endorses the original findings and recommendations of du Randt (1992) and the various sub-sections (du Randt & Headley, 1992b; 1992c; 1992d) as still being valid to this very day.

Furthermore, the modern critiques as well as proposed solutions of both Abbott *et al.* (2007) and Vaeyens *et al.* (submitted) that received extensive review are endorsed. Once again these endorsements serve as a conclusion of this study with the further recommendation being that these factors are considered, *as far as practically and scientifically possible*, in future talent identification approaches. It is recommended that genetic testing, while promising, should rather be observed a while longer before concrete decisions in this regard are made.

Of particular importance to the preceding discussion and the abridged examples presented of the approaches implemented by Canada, Scotland and New Zealand to talent identification and development (in chapter six), is that talent development be considered the primary driver with talent identification serving a supplementary and supporting role. Without being flippant, development develops the (potential) talent that identification strives to identify. A recommendation of this study is that ongoing and broad spectrum talent development is performed within the context of South African sport with talent identification performing a supplementary function in this regard.

9.2.5.1 Talent identification and development in SANZAR

The different approaches of talent identification and development within the SANZAR countries were presented in chapter six. It is not possible to state whether one country's methods are superior to another, since each of the counties have their own inherent strengths and weaknesses associated with their methods and approaches. The conclusion of this study is that within the South African context,

the future looks promising and if the systems can be adopted and adapted where necessary into an all-encompassing holistic approach that suits all role-players, South Africa's sustained high level participation in the international rugby arena is guaranteed. The recommendation in this regard is that the research community contribute toward the goals and mission of SARU as much as possible so as to develop and improve systems for talent identification and development.

In conclusion, when considering whether this study has achieved the first aim of providing an in-depth literature review, the answer is affirmative. It is however recommended that further study be undertaken, particularly with regards to talent development and identification and the relative impact that these two approaches have on one another.

9.3 CONCLUSIONS AND RECOMMENDATIONS FROM THE EMPIRICAL INVESTIGATION

In adopting an evolutionary approach to the testing protocol as was done in this study, the risks were always going to be high. On the whole, however, while the risks were admittedly high, and while the results can best be described as mixed (the skills tests), the results are certainly promising. Furthermore, statistically simulated norms were provided for future comparison.

9.3.1 Interviews with coaches and conditioning specialists

The interviews with the coaches and the conditioning specialists served to confirm that the current talent identification approaches in rugby as pioneered by Pienaar and Spamer (1995) in Pienaar and Spamer (1998) and used in various forms in a *large number* of subsequent studies are certainly robust and valid and need very little, if any, modification. What this study attempted from some of the advice garnered from these coaches was to adapt and devise new sport-specific tests that accurately reflect the game-specific environment experienced in rugby. The intention of this study was not to improve upon the preceding tests and protocols, but to provide alternative tests so as to broaden the base of possible tests that could

be considered for future evaluation purposes. But, as noted earlier and in summary of this sub-section, the interviews and subsequent elaboration thereupon further emphasised the quality and relevance of the extant literature in the field of talent identification in rugby in South Africa.

9.3.2 Test protocol evolution

Subsequent, during and after testing on the three occasions mentioned during the course of chapters seven and eight, certain sport-specific skills tests were discarded, another test was modified and two sport-specific skills tests were retained. These decisions were taken primarily on the basis of the results obtained from practically performing these tests *in conjunction* with factors such as applicability to the sport and practical usage within field testing protocols.

9.3.3 Results obtained

As noted on numerous occasions, the results are mixed yet promising. While it is disappointing that so many sport-specific tests had to be discarded, the silver-lining to this is that the tests that remained are robust and valid and that there are now statistically simulated norms for positional groupings.

The specific findings of the anthropometrical, physical-motor, sports specific-skills and sport vision ability as these pertain to the positional groupings can be found in chapter eight of this study. Specific conclusions and recommendations regarding the self-devised tests are provided hereafter:

9.3.3.1 Discarded tests

It is concluded that there were tests that have merit (kick for accuracy-quadrant; push press for strength; Accuvision 1000 “120 lights”) and tests that cannot be described in that way (hooker throw in at 6m, 8m, 10m; scrumhalf tyre test). The kick for accuracy (quadrant) test can certainly be used as a training approach for accuracy kicking. The push press test for strength can and should be used in ascertaining the relative upper-body strength of the lineout lifters, although its ability

to test sport specific strength is questionable. The Accuvision1000 “120 lights” test has merit as a laboratory test. These are therefore the associated recommendations for these tests.

9.3.3.2 Final test protocol

It is concluded that the final test protocol for this study adequately achieved the second main aim of this study, i.e.: to provide an alternative sport and position-specific testing protocol as well as comparative results consisting of norms and scores that will adequately identify and select those capable of participating in elite age-group rugby union.

While the anthropometrical tests were pre-existing, one self-devised physical-motor test, i.e.: the 3x5x22m Anaerobic Capacity Test has been successfully established with statistically simulated norms. The sport-specific tests, i.e.: kick for distance and accuracy and the S-Tests were successfully integrated although no statistically simulated norms could be established due to their small base sizes.

It is recommended that further studies be conducted on the kick for distance and accuracy test as well as the S-Tests. The norms for the S-Test fall into four basic categories ranging from bad, poor, average and good. While this might suffice, the recommendation is made that further studies on this test be conducted on elite players to determine the relative ability of these players in this test for future reference. A further recommendation is that the S-Test be included in testing protocols along with the pre-existing tests originally devised by Pienaar and Spamer (1995) in Pienaar and Spamer (1998), since if anything, this study has highlighted the efficacy of these preceding protocols and tests. It is also strongly recommended that the kick for distance and accuracy test be used in future protocols to establish norms for comparison with the same recommendation applying regarding its inclusion with other pre-existing tests.

A further and final recommendation for this study is to utilise this final test protocol in further studies that include a broader sample. Now that the final protocol has been settled upon and the measurements are now standardised across the board, this would enable the current norms (statistically simulated and otherwise) to be validated against similar samples.

9.4 CONCLUSIONS AND RECOMMENDATIONS REGARDING STUDY HYPOTHESIS

The hypothesis noted in chapter one is as follows: the findings of this study will contribute meaningfully to elite rugby union by providing sport and position specific test protocols as well as norms and standards for comparison.

It is concluded that this study does in fact contribute to elite rugby union first and foremost by providing a sport-specific test protocol. Secondly, while this protocol is not position specific from no's 1 to 15 in the rugby team, it does provide an indication of the relative abilities needed by grouped positions consisting of the tight-forwards, loose-forwards and backline players. Norms and standards for future comparison have been established.

Therefore, the hypothesis of this study has been achieved.