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The identification and development of training behaviours in Professional Rugby players

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THE IDENTIFICATION AND DEVELOPMENT OF TRAINING BEHAVIOURS IN PROFESSIONAL RUGBY PLAYERS

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Thesis submitted to the University of Wales in fulfilment of the requirements of the degree of Doctor of Philosophy at the University of Wales, Bangor

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DECLARATION

This work has not been previously accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

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<u>Acknowledgements</u>

Finally, thank you to everyone else who has helped there are too many to mention. Whether it was providing space for me to work or listening to me over the phone; stopping to listen to me ramble in the mountains; or on the sea; listening to me rabbit on about training when we are out running or sat in the pub. Thank you.

General Introduction

A significant amount of time in the sport psychology domain seems to have been spent considering how to improve the psychological skills that athletes use during competition. (Gould, Eklund and Jackson, 1992; Orlick and Partington, 1988; Smith, 2003). Considering athletes spend the majority of their time in training it seems logical that sport psychologists should also help athletes to improve training as well (Orlick and Partington, 1988; Ericsson, 1990; McCann 1995; Helson, Starkes and Hodges, 1998; Durand - Bush and Salmela, 2002; Morgan and Giacobbi, 2006; MacNamara, Button and Collins, 2010). Much time is spent away from the training and performance environment (at home) and may play a significant part in the development of the players. Home is mentioned in several studies: (Woodman and Hardy, 2001;Nicholls, Holt ,Polman and Bloomfield, 2006; Eysenck, Derackshan, Santos and Calvo, 2007) The purpose of the first, exploratory, study was to identify characteristics and behaviours in these three environments (performance, training, and away from training) which coaches thought the players needed in order to 'make it' as professional rugby players. At the end of the first, study several characteristics and behaviours emerged from the data in each environment. The researcher wanted to create a series of applied studies that would have utility for both coaches and athletes. As a result of this view at the beginning of the second study a decision was made to focus on training behaviours and characteristics necessary to become a professional rugby player, to develop a tool for the measurement of those training behaviours and characteristics, and to develop an intervention to improve at least some of those training behaviours in a professional rugby environment.

Talent Identification / Talent Development.
Simonton (1999) debates the nature vs. nurture issue, whether talent is innate or can be developed. He identifies that the debate has been continuing since Francis Gallon (1874) coined the term. The 'natural selection' school of thought suggests that talent is innate. The innate view of talent assumes that it is predetermined and relatively stable and as such cannot be altered over time (Abbott, Collins, Martindale, and Sowerby 2002). A growing body of evidence suggests that genetics may play a secondary role to the one played by the environment, e.g. Ericsson, Krampe and Tesch – Romer (1993) investigated expert typists and reaction time. They found that although the experts were faster and more accurate than non experts in their domain they did not have better scores when the skills were transferred to a general skill such as a simple reaction time test or general tests of perception. Gould

Dieffenbach, and Moffett (2002) proposed genetics as one of three sources of 'individual development' in interviews with Olympic athletes. According to Smith (2003) genetic traits are thought to account for up to half of the variation in performance between individuals. The study concludes that, 'sport performance requires an athlete to integrate many factors, some trainable (psychology, physiology, and skill, some teachable (tactics) and others outside of the control of the athlete or coach (genetics and age).' Hopkins (2001) (cites Fox, Hershberger and Bouchard 1996) who claim more than half the initial variation in visual ability is inherited. It appears that the degree of influence genetics has, is difficult to quantify. It is recognised by many researchers that it has some bearing. Morgan and Giacobbi (2006) recognised the influence of genetics alongside that of practice and psychological skills in talent development in highly successful collegiate athletes. Other authors (Durand – Bush, and Salmela 2002; Simonton 1999; Williams and Reilly, 2000; Jarodska, Scheiter, Gerjets, and van Gog 2010; Gee, 2010; and Trankle and Cushion 2006) acknowledge the influence of genetics in their research yet none are able to quantify the amount of influence it may have. Ericsson (1996) claims talent development results much more from deliberate practice than from inherited characteristics or genetics.

Bompa (1994) advocated a more scientific approach to talent identification rather than a co-incidental approach, e.g. the athlete happened to have parents who were interested in the sport; the athlete had access to good coaches and lived close enough to good facilities alongside the necessary physiological and psychological characteristics. If all these circumstances and conditions combined then a potential elite athlete was possible. Talent identification programmes in the past appear to have been dominated by anthropometric and physiological considerations with psychological considerations taking a much smaller role. This may be a reasonable approach in certain sports. For example, height is a dominating factor in basketball and heavy weight rowing, and at the other end of the scale, horse racing. As early as the 1920's, researchers examined the potential of physiological and anthropometric measures to discriminate between athletes involved in different sporting events (Tanner 1964, de Garay et al. 1974). These measures have been as simple as age, height and weight to more complex somatotyping and tissue analysis, (Abbott et al. 2002). According to Bompa (1994) a scientific approach adopted by Eastern Block countries during the late 1960's and early 1970's resulted in as many as 80% of Bulgarian medallists coming through a talent identification process. Similar results were demonstrated by Romanian and East German athletes at the 1972, 1976 and 1980 Olympic Games. Set against a back drop of the rest of the world using no scientific approaches to talent identification the results are understandable. Often the process of talent identification may be mislabelled as talent

development. Williams and Reilly (2000) highlighted the importance of discovering potential talent rather than developing talent that already exists within the sport.

In an Australian study with female soccer players, Hoare and Warr (2000) suggested that it was possible to select players based on anthropometric, physiological and skill attributes. They demonstrated that from a squad of 17 athletes and a 12 month talent development programme, '10 players were selected for zone teams with two players progressing to state team selection within six months'. Following this line, it appears that 15 players were not selected for the state team after a 12 month talent development programme. Using anthropometric, physiological and skill attributes alone, as a selection criterion, does not therefore appear to be a particularly efficient way of finding potential zone or state athletes. If these teams were the teams from which international athletes were selected then it does not appear to be an efficient way of selecting potential international athletes. In many sports, anthropometric measurements seem to be less influential. For example, in tennis current mens player John Isner is 2.06m tall and David Ferrer is 1.75m tall. In many team sports, there may be large physical differences even between players in the same position; for example in rugby union, Peter Stringer is 1.70m tall and Michael Phillips is 1.91m tall. In football, Peter Crouch is 2.01m tall and Jermaine Defoe is 1.70m tall).

The use of solely anthropometric measures as a tool for talent identification and development appears to be problematic. Although it is accepted that anthropometric values are innate, the rate of growth patterns present problems because they are not linear; e.g. a child who is above average height at a young age may develop to be of average or below average height and vice versa (Ackland and Bloomfield, 1996, p57). An added complication to this is that exactly when an anthropometric measurement will become stable is unknown; e.g. at what age does someone stop growing? (Bloomfield 1995).

Physiology also has problems as a determinant of talent. Using shoulder flexibility as a measure to identify swimmers and non-swimmers Bloomfield et al. (1990) were unable to establish a significant difference between adolescent swimmers and non-swimmers, although a difference was seen between mature swimmers and mature non- swimmers. Shoulder flexibility was selected in this study as it is a major influence on propulsion in swimming. Other studies conducted were unable to identify specific anthropometric types or physiological features which were associated with success in different sporting events (Van der Walt, 1988; and de Garay et al. 1974). However, anthropometric and physiological parameters can differentiate between athletes in different sports once the parameters have stabilised (Abbott et al. 2002).

Talent identification and development is associated with athletes at a time in their maturity where the parameters have not yet stabilised. Williams and Reilly (2000) point to talent identification in soccer being driven by players who are born early in the academic year and so show greater physical maturity in comparison to their peers. Early maturation leads to selection to squads and in turn to greater exposure to expert coaching. Over time, this exacerbates the differences in the skills of older players and does not allow for late maturation. As Williams and Reilly (2000) point out, this process could significantly limit the pool of players available for talent development. They recommend that talent identification should use physical, physiological, psychological and sociological factors in combination. Abbott and Collins (2004) concur with Williams and Reilly (2000) and put forward that a multidimensional approach, rather than a unidimensional approach, is needed to address the issue of talent identification more successfully. As they state, with limited funds being available to sports for talent development, the more effective talent identification is, the more value for money will be attained.

Abbott and Collins (2004) describe that in early research into psychological characteristics, attempts to establish personality profiles for elite athletes proved inconclusive. Personality research in sport has been an area of interest in the past (Eysenck, Nias, & Cox, 1982), with Morgan (1980) claiming up to 45% of differences in performance could be accounted for by personality contrasts. Personality research in sport during the 1960's and 1970's tried to identify an 'athletic personality.' Several studies (Lakie, 1962, Fisher 1976, Vanek and Cratty 1970,) tried unsuccessfully to identify an 'athletic personality'. Difficulties arose at different levels in the study of 'athletic personalities'. Difficulties arose at a paradigm level; whether a trait approach, a dispositional approach, or a dispositional-state approach should be adopted. At a measurement level: several different tools were used to attempt to measure personality: the Minnesota Multiphasic Personality Inventory (MMPI, Hathaway and McKinle,1943); the 16 Personality Factor Questionnaire (16PF, Cattell 1946); and the Eysenck Personality Inventory (EPI, Eysenck and Eysenck, 1975). Each measurement tool defined similar personality characteristics in different ways. Similar measurement issues, e.g. the establishment of a set of unified variables arose in the other paradigms (Vealey 2002, cited in Horn). In spite of these issues, research has continued into personality traits. There seems to have been a convergence of research on the existence of five trait dimensions (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness), (Digman 1990). The five factor model appears to predict achievement related outcomes in a number of areas, e.g. occupational and academic success (Digman, 1989; Tett, Jackson and Rothstein, 1991; Piedmont 1995). It therefore seems reasonable that some of the

dimensions of the five factor model may relate to other achievement orientated outcomes; e.g. athletic performance. Abbott and Collins (2004) in their review of psychological determinants of performance concluded personality studies may only provide fragile links between personality and athletic success.

More contemporary research has focused on the development of psychological skills (Mahoney, Gabriel and Perkins., 1987; Smith and Christensen, 1995; Thomas, Murphy and Hardy, 1999; Frey, Laguna and Ravizza, 2003; Giacobbi, Foore and Weinberg, 2004; Harwood, Cumming and Fletcher, 2004; Meyer and Fletcher, 2007; Harwood 2008); e.g. goal setting, self-talk and imagery, rather than personality variables. Psychological characteristics developed through psychological skills training have been shown to discriminate between medal winners and non-medallists (e.g. Orlick and Partington, 1988; Gould et al., 1992; Gould et al., 1993). Orlick and Partington (1988) interviewed 75 Canadian Olympic athletes and surveyed a further 160 Canadian athletes to establish the mental skills involved in excellence. They identified the following skills: quality training; clear daily goals; imagery training; simulation training; mental preparation for competition which included pre-competition plans, competition focus plans and competition evaluation and distraction control. Orlick and Partington state, 'it was clear from our study,' that these skills were brought about by, 'learning the elements of success'. According to Orlick and Partington (1988), the skills that were listed, were brought about by listening to others, watching, talking, reading, experimenting, practicing, performing, thinking, experiencing, recording and evaluating. All the athletes in this study recognised the importance of these elements. Orlick and Partington (1988) made it clear that the necessary elements for a successful career were learned by the athletes and were not all present at the beginning of the athlete's career. Furthermore, examples given in the athletes' transcripts showed that athletes often adopted a trial and error method to developing these elements. Gould and Dieffenbach (2002) also attempted to examine the psychological characteristics of Olympic champions. Ten U.S. Olympic champions were interviewed along with their coaches, parents, or significant others. Gould and Dieffenbach (2002) established that these 10 athletes were characterised by a set of 12 psychological attributes, they were: the ability to cope with and control anxiety; confidence; mental toughness / resiliency; sport intelligence; the ability to focus and block out distractions; competitiveness; a hard-work ethic; the ability to set and achieve goals; coachability; high levels of dispositional hope; optimism; and adaptive perfectionism.

As the time spent by athletes in reaching expert levels is considerable, approximately 10,000 hours or 10 years according to Ericsson (1990), and as approximately 99% of an athlete's

time is spent training, McCann (1995) proposed that it would be sensible to explore and try to improve this area of an athlete's life. Rather surprisingly, until recent research by Woodman, Zourbanos, Hardy, Beattie, and McQuillan. (2010), and Oliver (in press), training behaviours do not appear to have not been directly examined by sport psychology researchers; although several research papers have alluded to them indirectly.

Orlick and Partington (1988) identified 'quality training' as an important component of success in their interviews with Canadian Olympic athletes. They highlighted that a common theme was to prepare well for training; thinking about what was going to happen and how the training could help performance. Of Gould and Dieffenbach's (2002) set of 12 psychological characteristics which appeared common to their Olympic champions, coachability has an obvious link to training, but several others may have less direct links to both performance and training: ability to cope with and control anxiety; a hard-work ethic; and the ability to focus and block out distractions. To date, most of the attempts to identify the characteristics of successful athletes appear to have been done with Olympic sports people across a variety of sports (Orlick and Partington 1988; Gould and Dieffenbach 2002; Durand - Bush and Salmela, 2002). These papers have focused on characteristics of elite athletes in relation to their performance and training seems to have emerged from the data. More recently, two deliberate attempts have been made to examine training behaviours specifically. Woodman et al. (2010) examined the effects of personality and psychological skills on three training behaviours; coping with adversity; quality of preparation; and distractibility. Oliver (in press) identified seven training behaviours that emerged from focus group interviews with coaches who were asked for their views on training (practice) behaviours: professionalism, motivation, coping ability, commitment and effort, seeking improvement, concentration and negative behaviours. In the present research a deliberate and systematic approach is taken to explore training and training behaviours with a specific focus on rugby. Rugby was selected for the basis of this research because: All the research which had been published up to this point had looked for behaviours and characteristics for successful athletes across several sports; this was an opportunity to concentrate on a single sport. The approach of using a single sport may identify if behaviours and characteristics for identifying successful athletes were global concepts or specific to one sport. A second pragmatic reason was the researcher had access to successful athletes and coaches in this sport.

Rugby is a physically combative sport both in competition and in training. The combative nature of the sport means that squads of players tend to be large in number. Generally, within these squads players will have one or two year contracts. The large size of the squad

will also mean there may be as many as five players competing for one or two positions. Each year new players are drafted into the squad, from either the academy system of the same club or from other clubs. The players from the academy system of the club are new to professional rugby. They are likely to be in the first or second year of their careers, aged 18-21. Players may be transferred into the squad from other club academies. More experienced players may transferred in from other squads, these transfers can be made from anywhere around the globe. At the same time players leave to go to other clubs, are released from their contracts, or retire from the sport due to age or injury. All of these players follow very demanding physical conditioning, strength and power programmes as well as being expected to develop technically and tactically. Team selection decisions are based on how the coaches view the performance of these players in both the training environment and the competition environment, and this in turn determines if a player's contract is renewed. The investment made by the club in academy players is approximately £10,000 per year per player. Clubs are under considerable financial pressure. This is especially acute in the academy system where there is a demand for immediate investment in the players whilst the benefit of that investment may not be seen for between three to seven years, depending on position. Clubs are driven by short term goals, e.g. remaining in the premier division that season. Club owners often argue that it is better to pool the academy investment cash to employ one or two proven players for the first team squad.

>We released six players last year so that is six times £18,000 so it
>starts to mount up ... the owner could turn around and say why should I
>spend that money? I could go to South Africa and probably have got
>an international for the same amount, £120,000.
>(Extract of an interview with a coach from study 1 of the present thesis)

The thesis was designed to form a collection of potential research papers and as such this may lead to a small amount of overlap in information at the end of one chapter /study and the beginning of the next. The first study in the present programme of research was designed to make explicit the characteristics and behaviours professional rugby coaches thought were important in professional rugby players. It was to investigate characteristics and behaviours across all elements of the world of a professional rugby player, in order to try and identify those characteristics and behaviours that differentiated successful players (professional) from less successful players (amateur). For this study, a qualitative approach was adopted using grounded theory (Glaser and Strauss, 1967). The study was exploratory in nature with the researcher not really having expected outcomes or literature to support a

hypothesis. The focus of a grounded theory approach is to generate theory from the data provided. Seven coaches were contacted, from two United Kingdom Premiership rugby clubs, and agreed to take part in the study. Each coach was interviewed and the transcribed interviews then underwent several rounds of coding and thematic analysis to identify common themes. The result was 14 common themes which were split into two areas, physical characteristics and mental characteristics. As the thesis was psychologically based it was the mental characteristics which were of most interest to the researcher and went on to form the basis for the rest of the programme of research. At the end of the first study seven training characteristics and behaviours were identified.

The aim of study two was to determine: To what extent do the training behaviours identified in Study 1 determine the level of success of rugby players? In order to answer this question, a measurement tool (questionnaire) was designed to assess the seven behaviours that had emerged from the first study. Alongside answering the initial question in study two, the discriminant validity of the questionnaire was examined. The questionnaire had 42 items which tapped into the constructs of training characteristics and behaviours identified by the coaches in the first study. Two versions of the questionnaire were constructed; the first was for the players to complete, and the second for the coaches to complete with regard to the players.

The aim of the third study was to raise awareness of the players to the most powerful discriminatory factors identified by the coaches. By raising the awareness of the players to these factors it was hoped to improve the players' use of those training behaviours. To raise the awareness of players to the most important training behaviours identified by the coaches, an educational workshop was organised in which the players discussed how specific behaviours they used may reflect the characteristics and behaviours that discriminated between professional and amateur rugby players. Following the educational workshop, the researcher worked with the players to try and improve their training behaviours over a 12 week intervention period. Measurement using the two questionnaires developed in study two took place at six week intervals. Alongside the intervention group a control group was measured for the same training behaviours, at the same time points. Coaches and players in the control group completed the questionnaires, but did not receive any intervention.

Study One

Abstract

This study was designed to identify coaches' views of the psychological characteristics necessary to develop potential professional rugby players. It was an attempt to make explicit the implicit knowledge which the coaches' currently have. Seven premiership academy coaches, from two premiership rugby clubs were interviewed. Unstructured interviews were used to elicit detailed information from the coaches and rich data were obtained. The qualitative data were analysed using a grounded theory approach (Strauss and Corbin 1998). Results revealed eight common themes; evolving process, hassle, families, system below the club, coping in the system, work ethic, mental characteristics and physical characteristics. As this a was psychological study, considering the development of potential professional rugby players emphasis was placed on the themes; coping in the system, work ethic, and mental characteristics. These themes were re-examined using selective coding and eight themes emerged; general intelligence, social skills, personality, independence, determination, coping, ability to be coached, and dependability. After presenting these themes back to the coaches and asking for comments, the coaches felt general intelligence was too vague and so it was removed from the characteristics carried forward. Several other themes were questioned by the coaches and so a further round of analysis took place. In agreement with the coaches a final list of themes, related to training, emerged from the data; dependability; coping with the training environment; quality of preparation; distractibility; ability to be coached; social skills; and intensity of effort.

Introduction

The following exploratory study investigates and discusses coaches' implicit knowledge that informs selection decisions, with the aim of making that knowledge explicit, whilst helping the coaches to articulate their understanding of what it is that makes a professional rugby player. The processes of selection for the academy system and player development during the time at the academy should be enhanced. A better understanding of the essential characteristics of a potential recruit will enable coaches to either release fewer players at the end of the two

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or three year academy time or raise the standard of the players as they leave the academy, thereby making them more likely to gain employment at other clubs.

The researcher's experience of working with rugby players and the coaching staff of a premiership under 21 squad over the last four seasons has raised many questions. During this time, interactions have been with players as individuals, as sub-units of the team and the whole team. Interactions with coaches to try and improve the performance of both individuals and groups of players have also occurred. Discussions have often taken place with coaches centring on the question of who is going to get a first team contract at the club at the end of the time in the academy. The coaches seem to be in agreement, very quickly, concerning the players who are likely to stay and who are the players who will be released. The criteria that they use to select players are not explicit and generally they do not attempt to describe their common understanding of player characteristics that are salient.

The Academy System

The academy system has been set up by the premiership clubs in conjunction with the Rugby Football Union (RFU) to develop players from the age of 18 to 21. Funds transfer from the RFU to the premiership clubs for specific development within this age group. The RFU does not, however, pay the players within the academy system (there are no central contracts). Alongside money from the RFU, premiership clubs themselves invest in the academy players in the form of wages, coaching and time. The amount of funding provided by the individual clubs is arbitrary. The value the owners place on the academy system is reflected in the amount they invest.

Academy Personnel

The coaching staff for the academy involved in the present study consists of: an academy director, an assistant academy manager, and a conditioning coach. The conditioning coach divides his time equally between the academy and the first team squad. These staff are also supported by a physiotherapist who operates in a similar fashion to the conditioning coach. The roles of the three coaches are: the academy director primarily co-ordinates the day to day running of the academy, negotiates contracts with players within the academy and players entering the academy, and contributes to the coaching of the academy players with an emphasis on the forward players. The assistant academy manager's role is to scout players from lower age groups and identify them as potential academy players, liaise with

schools and county coaches in preparing players for entry into the academy at eighteen. The scouting and potential development role is shared between the academy director and the assistant academy manager insofar as the academy director will place more emphasis on the older players, i.e. 16-18 years and the assistant academy manager will be involved with the 14-16 years. The final decision, economic factors being taken into account on who enters, or does not enter, into the academy lies with the academy director. The conditioning coach's role is to improve the strength, speed and power of the players both prior to and during their time at the academy. Prior to academy entry, the conditioning coach may have selected players assigned to him so he can produce fitness programmes for those individuals to follow.

The club concerned claims to have a good success rate in producing players that go on to gain professional contracts within the premiership. Generally, the players will remain at that club. If players are released from the academy they are likely to continue their rugby careers at lower league teams either on professional or semi-professional contracts. Some players will transfer to other premiership clubs. The three exit routes from the academy account for the vast majority of the players.

There is a selection process that takes place at the end of the academy system. Young players are trying to obtain a first team contract. Not only do competitions exist between the academy players themselves, but also with current first team players in the same position.

The coaches recognise that considerable investment is made in the academy players, in terms of time and coaching but also in terms of the monetary investment by the owners of the club. The coaches strive to make this system as efficient as possible. Hence, if identification of players could become more efficient then the selection process would become more cost effective as the players entering the academy would be more likely to gain first team contracts. The investment made is approximately £10,000 per year per player. This investment is sound if the players succeed in gaining a first team contract and playing in the team either before the end of their academy career or on completion of it but less sound if they are released to other clubs as they leave the academy. By making the system more efficient the coaches would be more able to justify their selection choices to the owners of the clubs.

Hoare and Warr (2000) have suggested previously that selection should be based on anthropometric, physiological and skill attributes. Abbott and Collins (2004) propose that in talent identification and development, there should be more dimensions added to the

multidimensional construct and cite several examples where rugby union is used to demonstrate how anthropometric criteria could be used for talent identification. Anthropometric criteria are still used by the coaches as part of the implicit system employed. Implicitly psychological criteria appear to be employed by the coaches in the system. The psychological criteria used by the coaches seem to be much vaguer than the anthropometric or physiological criteria. The reason for this may be the difficulty in seeing or measuring the criteria e.g. height as an anthropometric criterion is easily measured as is speed as a physiological criterion. Attempts have been made in the past to establish psychological criteria for elite athlete e.g. personality (Morgan,1980; Eysenck, Nias, & Cox, 1982). The attempts to engage psychological criteria have not been successful, Collins and Abbott (2004) and Williams and Reilly (2000) propose a multidimensional approach to talent identification should be adopted. The coaches recognise that the system they use is too simplistic and, as a result of several years of experience and inefficiencies, that they need to consider other aspects in the talent identification and development process. Traditionally, the emphasis has been based around the players at the top rugby schools in the region whose players have gained representative honours at U-16 and U-18 level. However, the coaches' experience shows that players who gain early success do not always get full professional contracts.

In order to improve the reliability of this study a second premiership academy was approached. The coaches and staff from this academy have a similar structure to the one above with technical coaches being involved with the academy solely and the athletic performance coach and physiotherapist being involved with the academy and the 1st team squad.

The present study investigates the psychological factors associated with talent identification and development. It uses a grounded theory approach to elicit what coaches are looking for in a 16-18 year old rugby player in order for them to enter the academy system and have the best chance of succeeding once they are in the system.

Study Design

A grounded theory approach was employed in order to allow theory to emerge from the data (Strauss and Corbin 1998). Unstructured interviews were used to investigate coaches' implicit understanding of the psychological characteristics of professional rugby players. The validity of the interpretation of the coaches' understanding was tested in three ways. Firstly, member checking, a copy of each individual's transcript was returned to them to amend or

add to it as necessary. Secondly, coding was paralleled by a colleague, an expert in qualitative researcher. Thirdly, focus groups with the coaches at the club using a summary of the points raised by the individual coaches but written by the researcher, enabled their shared understanding to be clarified (Bryman 2001).

Method

Participants
Six coaches were interviewed who had varying amounts of experience:

The academy director played at international level to U18 level and was a squad member at U21 international level. At that point he moved into the coaching as a player coach in a lower division team and alongside this took up a position as a rugby development officer. The RFU then approached him to become a development officer in the North West of England, where he also took up a player coaching position with a local club. After several successful seasons, he was approached by his current club to set up and manage the academy, developing players to the U21 level. He has been in his current position for six years.

The assistant academy manager played rugby as a school boy. He played county level at U16 and U17. He was fast tracked through level 1 and 2 which led onto coaching at divisional level and North of England age group level. He was involved with the RFU tutor assessor scheme where he mentors in coach education; he became the first external verifier for the tutor assessor scheme. He now runs a coaching business part-time and has been involved with the Academy for 12- 18 months.

The conditioning coach played rugby as a school boy. He then played rugby for his local club until he attended university aged 18. Whilst at university he played student rugby and continued to play for local clubs. He studied a degree in coaching science, where his interest in conditioning for rugby developed. As part of the course he developed his interest in strength and conditioning, which is now his current position at the academy. He has been with the academy for 4 years.

The three coaches from the 2nd premiership club also had a variety of experience.

The academy head coach played professional rugby union for the club he is now coaching at, and played international rugby union. He took on a part time coaching role in the

previous season which has now developed into a fulltime position as he has retired from the professional game.

The player development coach has been involved with this age group for 20 years with the local club, county and school system. He has been with this premiership academy for 5 years.
The academy strength and conditioning coach played representative rugby as a schoolboy. He has a degree in Physical Education. He has ten years of experience as a coach at lower levels of the sport and in sport science support. He managed an academy at another premiership club and has been at this club, in his present role, for 3 years.

Procedure

Unstructured interviews were carried out individually with the six coaches. Rapport has been established with the first three coaches over a period of two to four years by helping both the players and the staff with sports psychology issues. The rapport built up allowed the staff to relax and express more fully their ideas and thoughts and give honest and unguarded answers in the areas of questions. The development of rapport with the second three coaches was initiated by an introduction from another member of the coaching staff. The interviewer then discussed with the individual coaches contemporary issues in rugby union from international selection to local coaching issues. The interviewer's experience as a player, a coach and a researcher in the field allowed rapport to be developed quickly. One of the coaches was the initial contact for entrance to the club. A relationship with this coach had existed for several years.

King (1994) suggests that 'qualitative research interviews' are most appropriate 'where an individual's perceptions of a process within a social unit are to be studied' or 'where exploratory work is required before a quantitative study.'
Unstructured interviews were chosen in the present study to allow the coaches to express their knowledge and develop their own lines of thought with minimal guidance from the interviewer. The interviewer also did not have a concrete idea of what was going to emerge from the data. To allow the coaches to express their opinions without the interviewer trying to drive the conversations in a specific direction, unstructured interviews seemed a sensible starting point. According to Patton (2002) efforts should be made in developing rapport with the interviewee as well neutrality of questioning. Rapport should be developed with the person being interviewed and neutrality should be maintained in regards to the content of

what both the interviewer and the interviewee say. All coaches understood that confidentiality would be maintained for the interviews. Neutrality was maintained. The interviewer has gained experience of this nature from previous interviews, research methods courses studied at post graduate level, and counselling courses attended. A pilot interview was conducted prior to the actual interviews commencing. The feedback from this, given by an expert in qualitative research, increased the awareness for the need for neutrality and conscious efforts were made by the interviewer to maintain neutrality.

Interviews

Each of the coaches was sent an information sheet, (see Appendix 1). The initial question, 'My interest is in how you select players to enter the academy?' led to interviews which lasted between 45 and 60 minutes. The interviews were carried out in the offices of the coaches over a five day period, for the first three coaches. Each of the second three coaches was interviewed in a single day at a later date, again in their offices. The interviews were recorded using a digital dictaphone. Each of the coaches discussed the selection and development process from their own area of expertise. Rich data was obtained from each of the coaches and the interviews were uploaded onto a personal computer (PC). The interviews were then transcribed verbatim using a voice recognition programme. Copies of the transcripts were checked and then sent to the coaches to read and add comments if they wished to, or to expand further on points they had made. Once the coaches had agreed that the transcript reflected their understanding, an open coding analysis was employed to distinguish themes from each of the individual interviews. Open coding is the process of drawing out dimensions and properties from the raw data (Strauss and Corbin 1998).

The aim of the analysis was to discover themes in the coach's interviews. An open coding process was used to establish the initial areas of interest. Open coding is an inductive, systematic process used to uncover themes from, in this case, interview data in which the researcher makes an effort to code all relevant information (Glaser and Strauss 1967). As a result of this process a total of 40 themes were identified.

After the establishment of the 40 themes from the open coding a second level of coding, axial, took place. Axial coding is the process of linking the results of the open coding process to establish new properties and dimensions (Strauss and Corbin 1998); the second level involved establishing common areas, or themes between the six coaches, using similar words and phrases. The titles of the themes were evoked meaning codes allocated by the interviewer during this analysis process. The axial coding process switched from being an

inductive process initially to being a mixture of inductive and deductive processes as the data were analysed (Pidgeon and Henwood 1997). The process of establishing the initial themes was then paralleled by a process of still establishing new themes but also fitting new information into the themes already available. The process of axial coding revealed eight common areas described below:

Results and Discussion

Physical characteristics

> 'You've got to choose the players quickly so I think two out of the three players we signed looked the part, physically, they are we hope - able to cope with the jump quicker than maybe players have in the past.'

> 'The best players at this moment in time physically they are a little bit more developed'

> 'My point of view is strength and conditioning so I can see a kid at 16 and say yes they have the potential to play rugby at a very high standard. So you can see at age 16 someone who is phenomenally strong or a certain body shape.'

These quotes described how the coaches continue to use anthropometric criteria as part of the selection process. The coaches do however recognise that this may only be a single criterion in a long list. The coaches also recognise that the anthropometric criteria may vary according to position.

> 'Now only two of those props were over 5' 9" which means, with all due respect the others aren't going to make it and who knows if those two, if they are going to make it, and that is the sort of physicality you've got to look at, as well.'

> 'They can be the most talented player but, if they are physically not up to it then let's face it ... the guys in the last year of the academy... the next step is first team rugby.'

The coaches have a very clear understanding of what their role is. They recognise in certain positions anthropometry may be important and that the players leaving their system will be expected to enter the 1st team squad or leave the club.

Evolving Process

> 'So we are spending more time trying to find all that he has. More than he was a player at school. There is a broad band of players and you could literally throw a net out, you could bring in a lot of players again which, we did in the second and third year. When we set up we signed more players. This year we have only signed three and we looked at those three. I'm not saying they are perfect but we have looked at those three and we feel that we know enough about them to get them through the system.'

> 'The stats show us now, that the amount of players we have signed in the last three years, that came from those schools [public schools in the region; traditional feeder schools for the club] and the ones that are coming through it's just doesn't make any sense.'

The process is moving forward on several levels. The first is how the coaches identify and the recruit the individual. Secondly, how the selection system has changed in the 6 years the academy has been in existence. Thirdly, the area that the club recruit potential players from and how they are trying to widen the field of choice. The majority of potential academy players came from a very narrow field in the past. The players from this field seemed to bring similar challenges with them.

> 'There are some common characteristics, as well, that we start to find. When they come through schools and the kids who come out of particular schools and cause us the same problems…. fantastic rugby players because they are at the best rugby playing school but, as individuals they are absolute nightmares because, they have no social skills at all.'

Finally, we consider how the standing of the club itself has changed within the rugby union community. The rise of the club has allowed the coaches to be more selective and puts them in a situation now where people are contacting them in regards to academy positions.

> 'Because when we started this process six years ago we didn't have a choice. We were 10th in the premiership, very unfashionable club, they were getting 3500 [spectators] every Saturday, if you are lucky. No academy system, everyone from

the region went south and now the system is if I want to be an England player they need to come to us.'

Hassle

'Here are the best 12 players and we then siphon them out which, is right, we need to siphon them down and get rid of some, they are all very good ... we could take all 12, but we will get rid of the ones we don't want the hassle with, and that's how it works I suppose.'

The coaches are considering more than just the playing ability of the player. It is the playing ability that has got the potential academy player into that position. Without the basic ability the player would not even be considered. Once the player has reached that level a more holistic approach is adopted by the coaches to consider which players will enter the academy system.

'One of the criteria is that you don't have a pushy dad syndrome. We've got lads with pushy dad syndromes that are knocking about the circuit in the EPDC [elite player development centre] and they're just a nuisance and [the parents] are an embarrassment to their sons in some cases.'

The coaches seem to be looking for more than just talent they are considering how well the player will fit into the culture of the club.

'Talking to others, when they recruit a player, they recruit a player based upon their playing ability and will they fit into the clubs' ethic? Some fit in because they are hardworking, a fair days pay for a fair days graft, many of the players have been built on this. The club needs to keep this model.'

Families

The coaches understand that the support of the family is important in the development of a player at the academy level. They are trying to reach a balance between the support the family can give and the player being independent

'It's a really difficult one because the role of the family is; you want people that are strong first, that are supportive, but, you don't want them to be involved with the player, once the player comes here, to the point where they are still, not living at home, but, they have a mentality that they are living at home.'

The coaches also understand that part of the development of the player is about them becoming independent as a person as they develop as rugby players and as people. The success of the academy system has improved the selection process in terms of the ability of the rugby player but seems to have had a counter effect in other areas. When the players come from the local region they seem to demonstrate less independence. There is a balance here between the evolving process of the club and the influence the family can have on a daily basis.

'I have an example because he came from down south as a young lad, he moved away from home. My relationship with him became very close because he needed someone to talk to he needed someone to help him out. He couldn't run home every two minutes. Because we have got to a good system a lot of our players come from the area. Most are 30 minutes up the road. 20 minutes up the road. They take their washing home. Mum comes down and cleans the flat for them. I tell them don't, that is not helping him, he needs to learn off the field. This is a big area for us. We want these kids to learn how to live. The player needs to stand on his own two feet, just the full package really.'

The coaches see how the family has an influence on the player and how this is an important 'piece of the jigsaw' in how the player is going to perform in this environment.

'We meet them and have a chat with them. There's massive steerage in terms of the background, the personality the player had according to the parents. They're a massive indicator of how the kids going to be, because of the social surrounds the kids been brought up in, by what the parents value.'

Often the expectations of the family clash with the expectations of the club and the reality of the situation for potential professional rugby players.

'Educating parents is difficult, you don't get a lot of time to speak to them. Ideally we try to talk to the EPDC parents, but parents have dreams, and young Johnny might

be a talented 13-15 year old and like a lot of parents and young players of that age they tend to look too far ahead. The dream is playing for the club, the dream is playing for the country, and the dream is playing in the World Cup. They are great dreams to have, but they need to be put in an envelope on a shelf and get on with the day to day routine of things, and not get too upset if you don't make the progress at the rate you think you should be. So talking to parents is probably an area that we need to spend a little bit more time on generally as a country, because they don't have the knowledge, they don't understand the systems, so we need to give them that foundation of what we're trying to do and that will help them understand because the percentage of young players that get to the very top is less than 1%. Once they understand they will be able to cope with the highs and the lows that their son had.'

System below the club

There are two major feeder systems that underpin entry into the academy. The first are specific schools which have a tradition of producing strong U-18 sides which compete nationally in various competitions and locally with traditional fixtures.

> 'You're talking about schools that have got hundreds of years in heritage. Hundreds of years of tradition and will still send kids to other clubs. Nothing I say, if I go in there will change the way they do things.'

There appears, at times, to be disagreement between the schools and the club. A player might be playing in a different position for his school than the club would like him to play, examples have been given where the school wants the player to play prop forward but the club want him to play hooker. However, the objectives of the schools rugby programme would need to be considered in order to investigate this further. These objectives are beyond the scope of this study. The county system is the second area of recruitment for the academy.

> 'We just really started an early identification program with about 15 to 20 kids where we've identified what we think we will need through the county developments squads.'

There appears to be, at times, disagreement between the county system and the club. The coach at the club deals with the younger players (15-16 yrs) his remit is to consider the individuals talent and skill. The county system, for the coaches involved in that, is an end in

itself for those coaches. It is not about talent development but about winning the county championship at that age group.

> 'I certainly do because I think a lot of coaches are frightened to death of losing. You need to be, not frightened to lose, but try…. if you're playing against a superior side, a fantastic team then you're going to get beaten but, still try still carry on and do the things that you're doing and if you get leathered then it is unfortunate, it's one of those things, take the learning experience.'

Coping in the system

The coaches at the club understand the pressure the new players are placed under when they arrive at the club. The coaches do not intentionally strive to do this but, they see it as an inevitable consequence of the 'hot house' process. Pressure comes from several directions. Players need to be able to cope with the fact they are not the outstanding player anymore.

> 'So you always invest in him and it's how he copes with not being the best which again, is the character in him, we have made mistakes massively. The people you bring in, can they cope with being at the top off the tree and then being absolutely at the bottom when they are 18 and a day? That is one of the hardest things for them.'

There is a pressure to keep up with the general pace of the academy and the other players in terms of physicality, skill development and psychologically. This will be described in greater detail later.

> 'Players are going to have their disappointments, rejections, bad performances. Not everything that they want to happen is going to happen so they're going to have down times. Therefore they need to be able to cope with that and learn from those experiences and puts the bad experiences behind them. ….. talk about it….. and then move on…. and I suppose how they do that and how well they do that will be a large factor in determining how they progress and whether they make it or not.'

> 'We want players who are confident….. if they make a mistake they're going to recover from it and redo it not sit there and blame themselves.'

The pressure here is in terms of the player's rugby union development. Pressure may also come from outside the club, from families, relationships, money and even the media.

> 'You are working in the best gym in the North of England with six or seven British lions, with all your kit, women, girls going mad at you because, you are a rugby player. When you go out they know who you are, if you make it you get a nice car, you get this, you get that, or you go to work down the pit.'

Every coach recognised the aspect of coping as an integral part of being successful within the academy system.

> 'Not get too upset if you don't make the progress at the rate you think you should be.'

> 'I'd also talk about robustness, in the terms of mental robustness, you might call that a toughness'

The coaches recognise that the development of players in this area is one which can be further enhanced.

> 'The area we don't pay a lot of attention to and work towards is that mental strength, ... that attitude side, I must admit we've been involved with the academy since preseason, July this year we've done one session and that is the session I ran again in training situations.'

Work ethic

> 'They come to work; they come here for a job.'

According to the coaches many of the academy players struggle with the change from school rugby to professional rugby. The players fail to understand what it means to be a professional rugby player. Players need to learn this as part of the academy process if they are going to progress to a first team contract at the end of their academy time.

> 'Some cope with that and knuckle down and work hard and some, it seems….. you know….. really struggle with that, they just don't want to know and then no matter what method you seemed to use to try and encourage them…. to motivate them…. for some individuals it just doesn't seem to work.'

The coaches understand the amount of work the players need to do in order for them to be in a position to obtain a 1st team contract at the end of their academy time. They also realise how much of this work goes unseen as with any professional sports person.

> 'Everybody thinks it's a marvellous existence but, if you were to be doing the preseason that these boys are doing at this moment in time, 99% of people would say you can have all the money you want mate. The players complete three sessions a day, six days a week, for six weeks. There are no short cuts whatsoever and you've got to have a certain mentality and a certain work ethic to be able to want to do that every day.'

> 'Our club also has its own culture, it's not the same as where they've come from, our expectations are different from where they've come from, the work we want them to do might be different from the work they anticipate doing.'

Both of the clubs recognised the difference in attitude that is necessary for recruits to be successful. The players need to switch from being excellent school rugby players, training two or three times per week, to being professional athletes. They need to consider everything they do and how it will effect their performance.

> 'It depends on their personality, of the seven that we took on this year, there are very few who don't have that real strong work ethic.'

The coaches will use this as another selection criterion.

> 'They could be really talented, but we'll walk away because he hasn't got it, he's too arrogant. He may have great talent, but we know that he will probably cost us too much and he may be more concerned about the material gifts than values.'

Mental characteristics

> 'Certainly mentally they are a little bit more developed… and their focus is a little bit more developed.'

On entry to the academy the coaches are looking for a 'little more development'. The coaches do not seem to be able to identify this specifically but they seem to be able to recognise this feature when they see it.

'Psychologically….. you've got to have someone with a willingness to learn, that's the key to it, a lack of arrogance but, at the same time confidence they've got to be confident of what their ability could get to be but, interesting without an arrogance of, you cannot teach me anything. Confidence, willingness to learn, hunger.'

The mental characteristics seem to be a combination of the features stated in the quote above.

Second Level Analysis

Once the general themes had been established, the raw data themes and the first level themes were given to a second researcher, an experienced qualitative researcher. They were asked to match the two sets of themes went through the same process. The second analyst collaborated on seven out of the eight interviewer identified axial themes. Discussion of the eighth theme led to agreement and an understanding by the second analyst on how the researcher had arrived at the themes selected.

Since the aim of the study was to identify the psychological characteristics associated selection, the emerging themes that were of interest were those labelled coping, work ethic and mental characteristics. As it was recognised that other areas may well affect these three, some of those will also be investigated further but with the three maintained as the central theme. The data from these categories were then analysed in further detail, using a selective coding method. The process of selective coding establishes the central themes and identifies relationships between them and the more peripheral themes already identified (Strauss and Corbin 1998). From the initial analysis of this specific data set, another round of inductive data analysis took place. As a result of the inductive analysis on the three themes, coping, work ethic and mental characteristics eight further categories were established.

General Intelligence

'From talking to the child themselves you know whether or not you can hold a reasonable conversation with them whether he has confidence in himself or whether he is somebody that will listen to you and can hold his concentration.'

The coaches see these skills as underpinning the process of becoming professional rugby players. The theme of intelligence fell into the category of coping as players need to cope with the volume and speed of information they are given.

> 'Intelligence is part and parcel …. you're not always going to get it, because if you look at some of the great players they are not the brightest sparks, but it's a good basis, a good basis to start with. Children certainly, you know, you have got to look for intelligence, and they have got to have some understanding of what you're doing, above and beyond the normal rugby sorts of thing.'

The coach here is looking for the player to be able to use their underpinning intelligence to understand what the coach is trying to achieve and apply it to rugby.

> 'I want character in a player I don't want him to be a robot….. yes I will go and jump in the canal if you say….. I don't want a player like that I want him to say why are we going to do that, is it going to help the team and is it going to help the game if I go and jump in the canal. If I explain to him and he accepts the explanation then yes, great, if it's not then I want them to be able to say don't be ridiculous. I'm not looking for Muppets.'

Social Skills

> 'Fantastic rugby players because they are at the best rugby playing school but, as individuals they are absolute nightmares because, they have no social skills at all.'

According to the coaches these players have real difficulty in making the transition from an excellent school player to a professional player. The majority of the problems with this small group of players begin off the pitch and can sometimes move into the playing area.

> 'This is the kind of player that you know no matter what you seemed to say it didn't really have an effect it didn't really push any of his buttons. You can tell him off, you can encourage him, you can pat him on the back and you can kick him up the arse, you can ask his mates you can encourage him from within, you can speak to his girlfriend, you can speak to his parents and nothing seems to have had an effect on him unfortunately the end of his second year he was released.'

Some of the players fail to understand how the priorities they emphasise needs to change.

'However, we played an invitational game later in the year when he knew his old school teacher was coming to watch. He was extremely motivated and he had the game of his life.'

'They can't cope with going out at night. They cannot cope with being told they are not the best, so we are actually going down…. starting with less of them. Even though they are the best kids at 18 they are not the best premiership players.'

The coaches use the players' behaviour in social situations as another measure of the their potential.

Personality

'Psychologically….. you have got to have someone with a willingness to learn, that's the key to it, a lack of arrogance but, at the same time confidence they've got to be confident of what their ability could get to be, but, interestingly without an arrogance of, you cannot teach me anything. The players need; confidence, willingness to learn, hunger.'

Coaches work with the players at the beginning of a potentially lucrative career. The players however will have experienced considerable success up to this point. As school players they have been a 'big fish in a small pond' as the players start at the academy they become 'small fish in a very big pond'. The coaches suspect that it is this issue that causes many problems. The coaches at the two academies may be the first people in the rugby world who have told these players they need to improve their skills. How the players react to this criticism often determines how well they will progress through the academy system. The coaches are trying to find strength of character which will allow the players to have a confidence which is difficult to 'shake'.

The coaches have examples of people who have come through the system successfully. They are using the successful cases as a comparison with players entering the academy system.

'Some of them have held their feet on the ground quite well. And I think what they've done is raised the bar….. if you can imagine there is a bar there for attitude, and there is a bar there for commitment, and there is a bar there for skill level. What they

have done for each level they have gone to; they have just taken it up another notch. Now that's what makes them a Lion that is what makes them play Premier league…. You ask them ... they will say that's good but, it's not good enough, and so they have notched it all up and they have notched it all up again. There are one or two of them who are naturally great rugby players but, there is one in particular will not ever fulfil his potential because of just the way he is. He will sit there, happy with those bars, where ever the bar is set for him.'

The coaches are looking for the players to raise the standard of performance in games and in training and to have the confidence to try and advance the game to new levels which will ultimately make them successful.

Present players entering the system are also recognised as having these characteristics.

'Shows to me he is someone who must have something. He is so laid back he is horizontal but, he's obviously thinking at some point, right, let's go, no doubt he is obviously someone who is quite driven.'

'He is willing and his parents are willing to support him to leave school and come here at 17. It's us that turned round and said, well do we want to take this kid and I'm being honest we have a moral concern. We really wouldn't want him living with the lads, when he is under 18. So he's still at school but we have got him thinking the right way.'

Independence

'This is a big area for us. We want these kids to learn how to live. To stand on his own two feet, just the full package really.'

'We see players for less than four hours a day so for another 20 hour of the day they are away with their families or whatever, so what they do in that time can have a massive bearing on their physical performance.'

'You have got and to be able to learn to switch off….. you know…. we're all here to work, we're all here to have a laugh, as well you know, if you walk round with a miserable face, it's going to be hard work but you have got to….. we were talking about player's identification, of what we want out of the player, how about, know

when to work, know when to play because there's times when some players still carry on playing when they should be in work mode. So you know somebody that can identify the right time and the wrong time is perhaps another thing that I would look at. We have certainly lost a couple or three players this year based on that.'

Coaches are trying to develop the players work ethic during training and away from the pitch. The coaches realise that the players need to learn how to live a disciplined lifestyle away from the club. The players drive themselves physically and mentally and much of their recovery is carried out away from the coaches. The coaches are trying to educate the players in how to live a lifestyle that will give them the best chance of success within the academy system and as professional athletes.

Determination

 'Rugby is a physical sport. It is a full body sport. It is a very demanding sport it is a sport that takes place over a long season they have simply got to show that will and desire 365 days a year, give or take a couple of weeks, that's really what they have got to do.'

The coaches are aware of the commitment necessary from the players in order to get through the academy system. In order for the players to have a chance of gaining a first team contract they need to commit to the training regime imposed upon them by the strength and conditioning staff. Most of the players who enter the system are under the guidance of the conditioning staff already but the intensity and volume of the training significantly increases once they become full time players.

'Actual progression is getting more and more difficult as the rewards in the game get bigger, interest in the game gets more, more players want to be involved so therefore the competition is stiffer, so the actual level of determination you need to have as well as the actual talent is getting greater and greater. So, the ones that have made it through you can see from day one they will walk over shattered glass to get there.'

The coaches saw this as an evolving process, the standards are raised each time there is an intake of players. The rugby union academy system is a relatively new idea so it is probably yet to reach its full standard. The coaches realise that there may be fluctuations in the levels in specific areas or for specific positions but they have a good idea of the standards they are looking for, in each position.

'We see players for less than four hours a day so for another 20 hour of the day they are away with their families or whatever so what they do in that time can have a massive bearing on their physical performance.'

The coaches look for players to keep a good lifestyle away from the club. This element requires determination as you are not being watched by the coaching staff as you are at training. The temptation to eat poor food and drink is there.

There is also a financial constraint placed upon the coaches, so they have to be more selective in their choices.

'I think you need to consider another aspect which is finance. So sometimes you have got make a very hard decision which is the balance of, is he an absolute elite player, does the owner expect you to get a player in the first-team squad in the next year? Out of the ones you're signing now that is the pressure that is put on you, because no matter what you've done in the past with our present owner…. he wants it now.'

The coaches are aware that professional sport is driven by short term success. So having the greatest team in the country in five years' time might be too late if the club has dropped out of the premiership. There is a balance to be struck between staying at the top level and developing players for three or four years in the future. The balance is between developing 'home grown' talent or buying in established players. The players need to cope with the short term need for results demanded by the sport and the owner. The players may not feel the pressure from the owner directly but it may be reflected through the selection decisions of the coaches.

'Players that haven't quite got that level of desire, perhaps they take those failures in a different way, they are not as bothered, they don't work as hard to try and put things right, or they say that they are going to but don't actually do that.'

The coaches are trying to make the system more efficient so they are able to identify and remove these players from the system at an earlier stage. It may be possible that this is an area for development.

Coping

The two following quotes have been previously used in the first level of coding in the coping in the system section, but they represent good examples for the coping section as well.

> 'So you always invest in him and it's how he copes with not being the best which again, that is character in him, we have made mistakes massively. The people you bring in, can they cope with being at the top off the tree and then being absolutely at the bottom when they are 18 and a day. That is one of the hardest things for them.'

> 'I'd also talk about robustness, in the terms of mental robustness, you might call that a toughness'

The coaches see this as one of the most difficult aspects of the players' development. The players drop from being at the top of their game to being at the bottom of the game in the course of five weeks, as they finish school and move into the open age system. This is then followed by a period of intense pre-season training where, the lack of fitness and skill, further exposes their rugby inadequacies which may in turn expose a lack of robustness in their confidence and ability to cope. The exposure of the lack of skills and fitness then remains with them for possibly the next two or three years as they progress through the academy system. The academy players need to demonstrate to the 1st team coaches, within that time, that they have achieved the necessary levels in all areas of development. If they achieve that early then they need to demonstrate the ability to maintain the levels.

> 'Yes you definitely see it over… you know… every one of the kids that come through will definitely have to deal with some failures some poor performances or whatever so on the pitch you'll see it …. and in training… you'll see if they are motivated… if that's what they want to do then they will knuckle down and try their best to improve and not repeat what has happened. If they have had, for example, bad fitness scores they will get on with it and you know…. run until they are sick however you know…. they will push themselves.'

This describes the ability of the players to recover from disappointment and show how they can recover in training by putting in the necessary physical commitment and demonstrating to the coaches how they can recover and continue to improve. A set of questions here are: are there characteristics within the players which are more likely to make them struggle to maintain or regain confidence? Can psychologists intervene to help players in that position?

'The truth is they have got to have good mental toughness to knuckle down and do what he needs to do to cope with some of the failures and disappointments.'

The robustness of the players in being able to cope with failure and disappointment is recognised as essential by all the coaches. The emphasis the coaches place on this is interesting in that they have no structures in place to help the players who are not coping or going through 'a rough patch'. This area may warrant further investigation. The coaches can give examples where people have been able to cope with what the coaches are asking them to deal with.

'I can think of one in particular who had a bit of success early on in his first year at the club, he played in a succession…. I wouldn't say he started but, he was involved in several premiership games. He was involved in Heineken cup games, so in his mind at the end of that first year was thinking right I'm in the squad. Then perhaps the squad was strengthened, he was, in his mind demoted back down to the 'A' team and didn't really feature much. He had that sort of set back or rejection as he saw it. He had offers from other clubs to go there but he said no and sat back and said I'm going to stick with this. He has really worked hard over the latter part of last season and through his transition of pre-season and he's looking pretty good so that's one particular instance where someone has knuckled down and done that.'

The coaches can also give examples where the players have not been able to cope with the disappointments of having, in this case, early success and then being dropped into the 'A' team.

'Yes definitely again you know errr…. one player actually, you know, joined the club from school. He was playing England under 21 a year early, while he was still at school. He wasn't signed as an Academy player, went straight into being a first team player played all those initial preseason first-team friendly games. He was involved in the first four or five premiership league games. He wasn't really performing as well as he should, kind of got demoted, he was sort of mucking about playing around in training.

The ability to be coached

The players who make it to the academy are not only challenged with regard to their ability to cope with the physical demands of full time rugby, they will need to cope with having to refine and improve their technical skills at the same rate as their physical development. The majority of the players entering the academy have generally been coached or seen by the coaches in the EPDC system.

> 'The basic skill level and the actual ability to do the basic skills correctly, because if you have got an athlete that can do the basic skills we can turn him into a better to rugby player than somebody that hasn't. There's a concentration on people who can pass off both hands even at an early age, people who can tackle in the correct positions .... people who can ruck, maul, make decisions, that sort of thing.'

> 'There are positional related skills that they must have, because at this level, 16-17 plus, their learning curves are too sharp, so if they haven't got it by then, history has proved to me that it's very difficult to put something there that's not there. You can improve things that are there but, if there is a technical deficiency say a lower body left shoulder tackle problem then it can be worked on but usually under pressure they revert to type. Because there's no history of having done it successfully then they forget under pressure. Working in an academy of this standing, you are going to be subjected to increasing pressure from day one because of the level of play when you're playing against, and, as you move closer to the 1st team; so the pressure intensifies. So that skill deficiency is easily exposed. That's why it is important to develop this at 16.'

Coaches are hoping that players entering the academy have all the necessary skills to be successful in the chosen position. The problem often comes when a player is asked to change position by the club. An example of this is in the front row where a player may have been a prop forward at school level but then is advised to switch to hooker in the academy. This change may be based purely on physical parameters. There may be a conflict in this situation between the schools, or the county and the club. The conflict, with the school, maybe further highlighted if the player is there on a sports scholarship.

Dependability

'Now if he turns up ten minutes or quarter of an hour late to training is he going to turn a ten minutes or quarter of an hour late to help you when you're down on the floor isolated with the ball in your hands.'

The coaches try to find players who are dependable. The coaches expect players to be physically in the right place at the right time, this is a given at this level of rugby but the coaches infer that they are looking for players to be psychologically in the right place at the right time.

'I know it's a bit of a strange comparison but it's that sort of thinking the idea that you want reliable people, people that are switched on, they work when they need to work, you want characters.'

The coaches are looking for people who are reliable in terms of they have a correct work ethic on a day to day basis. The physical reliability is easily demonstrated by the players being in the right place at the right time but, the psychological reliability, the players are ready to work hard in every training session is more difficult to demonstrate. It appears the psychological element of this is what the coaches are seeking.

'They come to work; they come here for a job.'

For some of the players leaving school at 18 this may be their first job that has developed out of a hobby. At this level the players are not allowed to be average they must be outstanding all the time. This may also put added pressure onto the players.

At this point eight themes appeared to have emerged from the data provided by the coaches. These themes appeared to give a comprehensive view of the psychological skills necessary to become a professional rugby player. The themes which emerged were: General intelligence; social skills; personality; independence; determination; coping; ability to be coached; and dependability. These eight categories were presented back to the coaches for member checking. After discussion with the coaches' it was felt that general intelligence was a characteristic which would be reflected in all of the other themes and was not specific enough to stand as a category on its own. With the agreement of the coaches general intelligence was removed from the final list. The coaches commented that several of the themes reflected their thoughts accurately but others did not reflect accurately enough their thoughts on the area. Personality and independence were highlighted by the coaches as themes which could be developed further.

On closer examination, personality in the first study appeared to contain components from determination, ability to be coached and coping so the category of personality was expanded into these three subcategories. One element of personality which stood out was titled dependability. Dependability is synonymous with contentiousness, one of the constructs of the 'Big Five' personality traits Costa and McCrae (1992), so that remained as a standalone construct. A further examination of the determination category revealed two subcategories. These subcategories reflected determination in the training environment and away from the training environment. The subcategory of determination in the training environment was relabelled as intensity of effort and added to the categories to be carried forward. A re-examination of the personality category showed examples of another sub-category. Phrases used by the coaches led to the formulation of the subcategory distractibility, for example;

        'He must be able to hold his concentration.'
and,
        'They must work when they need to work.'

The category was then discussed with colleagues and member checked with several of the coaches. With their agreement it was added as a category. According to Orlick and Partington (1988) and Gould and Dieffenbach et al. (2002) distraction control was a discriminator between successful and unsuccessful Olympians. Quality of preparation emerged as a subcategory from the initial category of independence. The elements were regarding warm up and cool down. Although this could be seen as not strictly part of the activities on the training field, discussion with the coaches suggested that this was an important element of training. It was not until this was identified and highlighted as a possible important behaviour did the coaches recognised it as such, so making implicit thoughts explicit. Quality training was identified by Orlick and Partington (1988) In their study with Olympic champions. At the beginning of study two; seven categories had been revealed which warranted greater investigation based on the on field criteria set by the researcher. The final categories were therefore: dependability; coping with the training environment; quality of preparation; distractibility; ability to be coached; social skills; and intensity of effort.

Study Two

To what extent do training behaviours determine the level of success of players in rugby union?

Abstract

This study attempted to discriminate between the training behaviours of professional and amateur rugby players. Using seven categories; dependability; coping with the training environment; quality of preparation; distractibility; ability to be coached; social skills; and intensity of effort, two measurement tools were developed. The first, The Training Related Variables Questionnaire (TRVQ), was distributed to 308 rugby players, 157 amateur players from nine clubs, and 151 professional players from seven clubs. At the same time a coaches' version, The Training Related Variables – Coaches Questionnaire (TRV-CQ) was distributed to the coaches of the 308 players. In order to examine the factorial validity of the two questionnaires confirmatory factor analysis was carried out. Once the factorial validity of the two questionnaires was adequately established, discriminant function analyses were carried out on the two sets of data. Results revealed that the player assessed training behaviours the players used discriminated between amateurs and professionals. The most important discriminating variables were quality of preparation, intensity of effort, coping with the training environment, and dependability. The coach assessed training behaviours also discriminated between amateurs and professionals. However, the most important discriminating variables were not the same as for the player assessed variables. They were ability to be coached, social skills intensity of effort, and dependability. The study highlights how players and coaches may misinterpret or misunderstand each others' perceptions.

Introduction

The predominant focus of sport psychology is on competitive performance (Gould, Eklund and Jackson, 1992; Orlick and Partington, 1988; Smith, 2003) even though athletes spend the vast majority of their time in training (Thomas, Murphy and Hardy, 1999; McCann, 1995). There is evidence to suggest that for an athlete to be classed as elite, it will take ten years of practice, or 10,000 hours of training to develop the necessary skill and experience (Helson, Starkes and Hodges, 1998; Ericsson, 1990).

Coaches recognise the importance of training behaviours in their athletes yet there is limited literature in the field (Thomas et al. 1999; Frey, Laguna and Ravizza, 2003). Coaches identify implicitly training behaviours through anecdotal experience, which, may lead to elite performance (Cote and Gilbert, 2009; Durand-Bush and Salmela, 2002).

To begin considering the experience of coaches and attempt to make explicit the implicit knowledge that coaches have, the author conducted a qualitative study which has been reported in Chapter 2. This study identified the psychological characteristics that coaches considered important in order for professional rugby union players to succeed in the academy system. Many of these characteristics were related to training behaviours. After interviews with coaches from two premiership rugby union clubs, seven themes were identified: intensity of effort; coping with the training environment; ability to be coached; social skills; distractibility; dependability; and quality of preparation.

Cote and Hay (2002), show that progression to elite levels of sport goes through four stages of development running from early childhood. The four stages in Cote and Hay's model are sampling, specialising, investment, and recreational. The area of interest for the present study is the third stage, investment.

The first year academy professional rugby player makes a commitment to achieving an elite level of performance. The commitment involved is reflected by the increase in the intensity of effort needed by the players and called for by the coaches. There is an emphasis on strategic, competitive, and skill development. Durand-Bush and Salmela (2002) interviewed ten Olympic athletes (four male and six female) who had won at least two gold medals at two separate Olympics or World Championships. There were three team sport athletes and seven individual sport athletes. Durand-Bush and Salmela (2002) identified that athletes' training activities become more intense and structured during the investment years. Training was based around the strategic, competitive, and skill development components of the sport. Athletes practiced between 15 and 40 hours per week and, in addition, to this spent between one and seven hours per week lifting weights. In marathon running, Jones (2006) discusses the training volume of Paula Radcliffe which was 25-30 miles per week as a promising 18 year old but ten years on was between 120-160 miles per week in full marathon training. Her present training is performed at a pace between 5:15 and 5:45 min per mile generally with 'tempo' running during which she will run at speeds around 5:00 min per mile. Alongside this she may complete 1-2 higher intensity sessions (95-100% VO2 Max) and 1-2 weights sessions per week. This increase in the intensity of effort that is required by developing athletes was also recognised by the rugby coaches in Study 1. In their

experience, the players who best cope with the increase in intensity are the players who will most likely succeed.

All players need to cope with a training environment in which they will be challenged physically, mentally, tactically and technically on a daily basis, (Durand-Bush and Salmela, 2002). The behaviour of the players, as a result of these challenges, may incur criticism from coaches or non-selection for a team. Coping is defined as the 'constantly changing cognitive and behavioural efforts to manage specific external and / or internal demands that are appraised as taxing or exceeding the resources of the person' (Lazarus and Folkman, 1984). Coping can be divided into coping effort, the amount of effort needed to cope with the situation (Cox and Ferguson, 1991), and coping effectiveness, the quality and direction of the coping effort (Folkman and Moskowitz, 2004). Nicholls et al. (2006) examined the coping responses and coping effectiveness of professional rugby union players. Their research revealed 25 different possible sources of stress including, 'training, coach/ player criticism and team selection,' Nicholls et al. (2006) recognised that the most frequently recorded coping strategies employed were not the most effective. Players in the professional rugby union training environment need to actively develop effective coping behaviours as they learn and are coached to develop new skills.

Piedmont, Hill and Blanco (1999) defined coachability as, 'the player's ability to listen, learn and apply coaches' instructions'. Orlick and Partington (1988) interviewed 75 Canadian Olympic athletes to establish the mental skills involved in excellence. Orlick and Partington identified 'learning the elements of success' as a factor in Olympic performance. The elements identified by Orlick and Partington, were learned by listening to others and themselves, watching, talking, reading, experimenting, practicing, performing, thinking, experiencing, recording and evaluating. All the athletes in this study recognised the importance of these elements. Orlick and Partington (1988) made it clear that the necessary elements for a successful career were learned by the athletes and were not there at the beginning of the athlete's career.

Ericsson (2006) explained the effects of 'deliberate practice', extended over longer time periods, e.g. the length of a career in rugby union. He explained that, even when individuals are highly motivated, repeated exposure to a task does not ensure the highest levels of attainment. In order for the highest levels of attainment to occur, the coach needs to account for the learners pre-existing knowledge so that the task can be understood after brief instruction. The communication process between the coach and the player was identified as an important factor in the speed of the players learning and progression.

Social skills have been described as "the ability to express both positive and negative feelings in the interpersonal context without suffering loss of social reinforcement" (Hersen and Bellack, 1977), and 'the ability to interact with others in a way that is both appropriate and effective' (Segrin and Taylor, 2007). Orlick and Partington (1988) recognised some of these skills when they described 'learning the elements of success'. Their athletes recognised the importance of listening, watching, thinking and talking. Gould, Dieffenbach and Moffatt (2002) also identified social skills as a raw data theme in their investigation of the psychological characteristics of Olympic champions. In the Gould et al. (2002) study, no athletes interviewed made raw data responses that were classified into this category. However, six parents/siblings/significant others and five coaches did identify athletes as having skills in this category. In a work context, Hochwarter, Witt, Treadway and Ferris (2006) suggest that socially skilled individuals are more likely to demonstrate patience with co-workers and engender positive feelings than are workers with low social skills. More socially skilled rugby players may be shown more patience from coaches and so afforded greater opportunity to find solutions to challenges within the training arena.

Orlick and Partington (1988) found that there was consistency amongst the athletes in the majority of mental skills they identified. Distraction control, dealing with setbacks or distractions appeared to be the strongest discriminators between successful and unsuccessful Olympians. The athletes who were the most consistently able to perform at the highest level possessed excellent strategies for regaining focus when things had gone wrong or when faced with distractions. Piedmont et al. (1999) make an association between neuroticism, its effect on distractibility, game performance and the coaches' ratings of the players. They suggested that elements of the Five Factor Model of Personality may have a significant influence on athletic performance with the two, potentially, most important factors identified as conscientiousness and neuroticism. Low neuroticism may help people to be 'undisturbed by distracting, negative impulses' Piedmont et al. (1999). According to Costa and McCrae (1992), conscientiousness reflects 'the tendency toward being dependable, purposeful, organised and achievement orientated'. Gould et al. (2002) studied ten Olympic champions, across nine different Olympic sports. Eight, (what they termed), 'umbrella categories,' of the athletes' psychological characteristics were identified. These 'umbrella categories' were constructed from 40 'higher order themes' and were described as the most global overall psychological characteristics. All the components of Costa and McCraes' (1992) conscientiousness definition were found in the 'higher order themes'. Grant and Langan-Fox (2007) demonstrated how conscientiousness plays a role, along with two other of the 'Big Five' characteristics, in maintaining wellbeing and occupational health in the

workplace. Connor-Smith and Flachsbart (2007) specifically linked conscientiousness and extraversion with better coping effectiveness.

Having re-analysed the qualitative data and discussed it with colleagues, quality of preparation was identified as an important theme by the rugby coaches in Chapter 2. Partington and Orlick (1986) identified and developed a rating scale based around a similar construct. In their case, they labelled the construct athlete readiness. From the results of The Athlete Readiness Form, Orlick and Partington (1988), identified important mental constructs as: quality training; simulation training; quality imagery; daily goal setting; pre-competition planning; competition focus planning; competition evaluation procedures; and distraction control which, collectively, they labelled 'learning the elements of success.' The present study examines whether there is a difference in the use of the seven behaviours described above by professional rugby players when compared to amateur rugby players of a similar age.

Method

Introduction

Two groups were recruited, one consisting of premiership rugby union players and the other consisting of amateur rugby union players to assess whether they differed in their use of different training behaviours. Two versions of a training related behaviours questionnaire were developed, one for players, and the other for coaches.. The coaches participation in the study was to try and compensate for self-bias (Podsakoff, MacKenzie, Podsakoff, Lee, 2003) in completing the questionnaires on the part of the players.

Participants

A total of 308 rugby union players participated in this study. The participants comprised of 151 professional players drawn from the English Premiership and the Celtic League. 157 players were, drawn from an array of amateur clubs in a range of English divisions from National League Three North, to North Lancashire League One. The professional players were drawn from six English Premiership clubs (N = 116), and one Celtic League club (N = 35). The amateur players were drawn from nine clubs in the English league system (N = 157): one club from National Division Three North (N = 18), four clubs from North Division Two West (N = 78), one club from South Lancashire and North Cheshire 1 (N = 8), and three clubs form North Lancashire division one (N = 53).

The professional players, ranged in age from 18 to 36 (M = 21.62 S.D. = 4.04). The rugby experience of the professional players ranged from 1 year to 30 years (M = 12.13 S.D. = 5.50). The years as a professional player ranged from 0 to 13 years (M = 3.13 S.D. = 3.10). The amateur players ranged in age from 18 to 47 (M = 25.41, S.D. = 4.81). The experience of the amateur players ranged from 1 to 34 years (M = 13.94 S.D. = 6.45).

A total of 17 rugby union coaches from the 16 clubs took part in this study. Nine coaches were based at the seven professional rugby union clubs and eight coaches were based at the seven amateur rugby union clubs. The range of the ages of the coaches at the professional clubs was 29 to 57 (M = 40.64 S.D. = 9.68). The experience of the professional coaches in years ranged from 3 to 30 (M = 12.73 S.D. = 10.46). The range of ages of coaches at the amateur clubs was 26 to 50 (M = 43.12 S.D. = 8.22). The experience of the amateur coaches in years ranged from 1 to 12 (M = 6.63 S.D. = 3.70)

Instrumentation

Training Related Variables Questionnaire (player's version).

To assess behaviours during training, the Training Related Variables Questionnaire (TRVQ) was developed from earlier questionnaires by Woodman et al. (2010) and Morgan (2004) who used the TRVQ with gymnasts Woodman et al. (2010) and Rugby Union players Morgan (2004). The version of the TRVQ used Woodman et al. (2010) consisted of 4 constructs: distractibility, coping with adversity, quality of preparation, and negative perfectionism. The version of the TRVQ used by Morgan (2004) consisted of 3 constructs: distractibility, withdrawal of effort, and taking criticism badly. In the present study the TRVQ consisted of 7 constructs: intensity of effort, coping with the training environment, ability to be coached, dependability, quality of preparation, distractibility and social skills. An exploratory qualitative study, which preceded the current exploration (see Chapter 2), identified seven areas which coaches regarded as important to success. Four of the areas had also been identified and initially explored by Woodman et al. (2010) and Morgan (2004). The further three areas that were considered in this study were: ability to be coached, dependability and social skills.

Through discussions with experienced rugby coaches and sport psychologists a total of 42 items were devised to try and capture the seven constructs. Players responded to each of the 42 items on a Likert scale (see Appendix 2); by rating items from 1 to 9 anchored by

'strongly disagree' (1) and 'strongly agree' (9). Examples of questions from each area are given: 'If I think the coach is making us work too hard I try to save some energy' (intensity/ withdrawal of effort); 'If the coach criticises me I feel less confident in my ability' (coping with the training environment / taking criticism badly); 'In every training session I try to improve my game' (ability to be coached); 'I do what I say I am going to do' (dependability); 'I use training situations to practice what I would do in a match (quality of preparation); 'At times my mind wanders to non-rugby thoughts during training' (distractibility) and 'I make an effort to engage with other members of the squad' (social skills).

Zourbanos (2003) and Morgan (2004) established internal reliability scores (Cronbach α) for their inventories that were above the accepted threshold (Cronbach's α > .70) (Hammond, 1995): withdrawal of effort (α .79), taking criticism badly (α .76), Quality of preparation (α .74) and, Distractibility (α .82). However, the construct validity of the present seven scale questionnaire had not been previously assessed using confirmatory factor analysis (CFA), nor had the three additional constructs (ability to be coached, dependability and social skills) had their internal consistency assessed by Cronbach's alpha. The seven scale questionnaire was tested for structural validity and internal reliability after data had been collected from the players..

Training Related Variables - Coach Questionnaire.

(TRV-CQ) A grid version of the TRVQ was created to enable the coaches to comparatively rate each of their players on the seven identified training behaviours (see Appendix 3). The TRV-CQ was a re-formatted version of the TRVQ. An example item from the TRVQ is 'I always think how I can improve my game' in the TRV-CQ the corresponding statement is 'this player always thinks how he can improve his game.'

The players' questionnaires were distributed with a front sheet on which descriptive data were gathered. There were two questions given to the amateur players to identify the players who were ex-professional sportsmen and those players who were good enough to play professional sport but chose not to:

     1. Have you ever been offered a contract to play full time professional sport?
     2. Did you accept the contract?

These questions were designed to screen out of the data those players who had been professionals in the past and those players who had reached a professional level but

decided to follow a different career path. Both these sets of amateurs were removed from the study because they were likely to demonstrate the behaviours of professionals although they were amateur athletes at the time of data collection.

A marker variable was introduced, in this case recovery state, to try and control for negative affect. The marker variable is not related to any of the other scales in the questionnaire, so that it should show no correlation to the other variables. The lack of correlation demonstrates that there has been no negative affect on the player's part. (Podsakoff, MacKenzie, Podsakoff and Lee, 2003).

Procedure

The researcher contacted the coaches by telephone to explain the purpose of the study. The data collection was carried out by the researcher organising a day to attend at the club. At each of the players' data collections, the researcher was present to answer any queries that arose from the players. A time was organised in agreement with the coaches that the players could complete the questionnaire.

The researcher was introduced to the players by the coach. The researcher gave a brief overview of the purpose of the study. The TRVQ was then distributed to the players. The researcher explained the data collection process to the players and emphasised the results would be kept confidential from other players and the coaches. It was explained to the players that there were no wrong or right answers and that they should answer as truthfully as possible. The emphasis on these factors was done to offset the likelihood of players giving socially desirable answers (Podsakoff et al. 2003). After completing their questionnaires, the players returned them to the researcher who stored them confidentially.

The coaches were too busy to complete the questionnaires on the day, so, the researcher explained the process to the coaches and left them a stamped addressed envelope so that they could return the questionnaires when completed. A list of players who had completed the questionnaires was sent to the coaches the following day by email, so only players who had completed the questionnaires were rated by the coaches. Where multiple coaches from one club were involved in the study, they divided the players up into groups which they felt they knew best and completed the TRV-CQ for those players. The researcher asked for the coaches' questionnaires to be returned within a week. In most cases this was complied with.

One of the professional coaches failed to complete the questionnaires and two of the professional coaches took three weeks before returning them.

Analyses

Confirmatory factor analysis was performed on the seven training related variables to try and reduce the multivariate dataset (Munro and Page, 1993).
Descriptive statistics and Discriminant Function Analysis were performed on the test variables to examine whether the training behaviours discriminated between the playing levels of the two groups of players.

Results

Confirmatory Factor Analyses

Confirmatory factor analyses (CFA) were performed to examine factorial validity of the player and coach questionnaires using LISREL8.80 (Joreskog and Sorbom, 1993). In accordance with the recommendations of Joreskog (1993) a sequential approach to model testing was adopted. Joreskog's approach examined the goodness of fit of the single factor models separately. Factors were then paired and the fits of these models were examined. Finally, a full model was constructed and the goodness of fit for the complete model was examined. In this study an abbreviated version of the sequential approach (Joreskog, 1993) was adopted. The abbreviated approach examined the goodness of fit of the single factor models and then the goodness of fit of the complete model. Initially, single factor analyses were completed on all the latent variables explored by the Training Related Variables Questionnaire (TRVQ) and the Training Related Variables –Coaches Questionnaire (TRV-CQ). Single factor models were tested to eliminate any poor loading items prior to a full model being examined. The distribution of the variables violated the assumption of multivariate normality, (TRVQ probabilities ranged from p<0.001 to p = 0.020 and TRV-CQ probabilities ranged from p< 0.001 to p = 0.003) so the maximum likelihood method of estimation was used with the Satorra-Bentler χ^2 (Satorra and Bentler, 2001), which corrects for non-normality. The χ^2 statistic tests the null hypothesis that the implied model and the observed covariances were not significantly different, so a good fit is indicated by a non- significant χ^2. Accepting or rejecting a model based on χ^2 alone has been criticised (Cohen, 1994). Hu and Bentler (1999) advocated the χ^2 statistic should be used in association with additional fit indices in

order to avoid the problems of sample size identified with χ^2 (Bentler and Bonett, 1980). In addition to the fit indices proposed by Hu and Bentler (1999), this study used a χ^2 to degrees of freedom ratio (df), (Loo and Loewen, 2002). Traditionally researchers have reported the χ^2/df ratio and taken values of less than or equal to 2.00 to indicate a reasonable level of model fit (Loo and Loewen, 2002). However, 2.00 does seem to be a somewhat arbitrary number and there appears to be a lack of consensus with researchers using cutoff values varying between 2.00 and 5.00 (Byrne, 1989). In parallel with consideration of the χ^2/df ratio, the standardised root mean square residual statistic (SRMR; Hu and Bentler, 1995), the root mean square error of approximation (RMSEA; Steiger and Lind 1980), comparative fit index (CFI; Bentler 1990), and the non-normed fit index (NNFI; Bentler 1990). The CFI and the NNFI were selected as goodness of fit assessment tools because they are not affected by sample size.

In the present study, goodness of fit was therefore determined with reference to chi squared, its degrees of freedom and significance value (χ^2 (df) and *p* value), the RMSEA, it's 95% confidence interval and significance value, (RMSEA; Steiger and Lind, 1980), the SRMR, and the CFI. Hu and Bentler's (1999) suggested cut off values of around 0.08 for SRMR, less than 0.06 for RMSEA, greater than or equal to 0.95 for CFI, and greater than or equal to 0.95 for NNFI are used in order to conclude that there is a relatively good fit between the hypothesised model and the observed data. Each subscale consisted of six items which were constructed to tap each of the seven constructs (dependability, coping with the training environment, quality of preparation, distractibility, ability to be coached, social skill and, intensity of effort).

Players Data

In the first instance data from the players were examined. Single factor analysis was carried out on all the items of the seven constructs. The initial results of these analyses are shown in Table 1.

Table 1 Initial Single factor analysis scores for TRVQ

Variable	S-B x^2	Degrees of freedom (df)	P-value	RMSEA	SRMR	NNFI	CFI
Dependability	11.93	9	0.21717	0.033	0.0297	0.982	0.989
Coping with the training environment	68.38	9	0.00000	0.147	0.1230	0.606	0.764
Quality of preparation	30.73	9	0.00033	0.089	0.0641	0.859	0.915
Distractability	28.20	9	0.00088	0.830	0.0470	0.941	0.965
Ability to be Coached	27.31	9	0.00124	0.810	0.0446	0.955	0.973
Social Skill	23.73	9	0.00476	0.073	0.0557	0.886	0.932
Intensity of effort	66.77	9	0.00000	0.145	0.0874	0.864	0.918

Subsequently, the items reflecting each construct were examined to try and reveal problematic items. Factor loadings, standardised residuals, modification indices and the content of the item were used as decision making tools to decide whether to retain or remove each item. This process resulted in the TRVQ being reduced from a 42 item questionnaire to a 30 item questionnaire. The final results of the single factor analyses are shown in Table 2. All of the remaining revised subscales demonstrated an acceptable level of fit according to guidelines by Hu & Bentler (1999).

Table 2 Final Single factor analysis scores for TRVQ

Variable. (Final number of items)	S-B χ^2	Degrees of freedom (df)	P-value	RMSEA	SRMR	NNFI	CFI
Dependability (5)	11.93	9	0.21717	0.033	0.0297	0.982	0.99
Coping with the training environment (3)	0.92	2	0.63040	0.000	0.0178	1.020	1.00
Quality of preparation (4)	2.04	2	0.36086	0.008	0.0202	0.999	1.00
Distractibility (4)	2.02	2	0.36473	0.005	0.0208	1.000	1.00
Ability to be Coached (4)	7.85	5	0.16462	0.043	0.0269	1.010	1.00
Social Skill (4)	3.33	2	0.18909	0.047	0.0303	0.990	0.99
Intensity of effort (3)	1.92	2	0.38320	0.000	0.0436	1.000	1.00

The Full Model

Once an acceptable fit for the single factor models had been established the full model was tested to assess the fit of the overall structure and to highlight any poor or cross loading items. Examination of the fit statistics revealed that the model had an acceptable fit by some criteria and an unacceptable fit by other criteria, (S-B χ^2/df = 1001.53/384: P-value = 0.0000: RMSEA = 0.074: SRMR = 0.0714: NNFI = 0.933: CFI = 0.941). An S-B χ^2/df ratio of 2.61, RMSEA of greater than 0.06 and, some high modification indices in the, dependability and, ability to be coached subscales, warranted a re- inspection of the model. After consideration of the modification indices for each of the three subscales and consideration of the item content, three further items were removed from the scales. A third model was tested and this time an acceptable fit was obtained (S-B χ^2/df = 616.10/303: P-value = 0.0000: RMSEA = 0.058: SRMR = 0.0707: NNFI = 0.965: CFI = 0.970). Cronbach's α scores are shown for each of the factors in Table 3, together with the factor loadings for each item.

Table 3 Final full model confirmatory factor analyses scores for TRVQ

Factor	Item	Factor loading	Cronbach's A	Mean	SD
Dependability	I do what I say I am going to do in training	0.59			
	In training, the coaches can rely on me to get the job done	0.66			
	My reputation as a 'good trainer' is important to me	0.57	0.70	7.01	1.49
	I take responsibility, for my actions, when training	0.68			
	I treat a training session as seriously as a game	0.70			
Coping with the training environment	I always take onboard the coaches' instructions and suggestions	0.63			
	If the coach criticises me in training I work harder to do things correctly	0.58	0.58	7.22	1.53
	If the coach criticises me I feel less confident in my ability	0.63			
Quality of preparation	I complete my own cool down after each session	0.54			
	I never go and work on my skills in my own time, or at the end of the training session	-0.53	0.62	6.02	1.85
	I use training situations to practice what I would do in a match	0.52			
	I mentally rehearse match situations a lot in training	0.80			
Distractibility	At times my mind wanders to non-rugby thoughts during training	0.82			
	I am easily distracted by others during a training session	0.67			
	I find it hard to concentrate when something is explained during training	0.61	0.71	4.30	2.06
	I let my concentration levels drop if I am performing something I know well in training. e.g. a drill	0.55			
Ability to be coached	I ask questions when I am not sure what to do	0.64			
	I can usually understand what the coaches are trying to do	0.66	0.70	7.47	1.36
	I am always ready to be coached	0.75			
	In every training session I try to improve my game	0.66			
Social skills	I am easy to work with	0.63			
	I make an effort to engage with other members of the squad	0.71	0.70	7.32	1.31
	I relate well to other people	0.76			
	I try to consider other people's opinions	0.57			
Intensity of effort	I always try my hardest in training	0.82			
	I consistently work hard in training	0.88	0.84	6.79	1.56
	I put maximum effort in right up to the end of every session	0.76			

Factor - Factor Correlations

Bivariate correlations between the factors were also examined. All factors showed positive correlations with each other with the exception of the distractibility factor which showed negative correlations with the other five factors. The positive correlations ranged from 0.85, between dependability and quality of preparation, and between ability to be coached and coping with the training environment, to 0.43, between Social Skill and Intensity of effort. Negative correlations ranged from - 0.54 between distractibility and intensity of effort to -0.18 between distractibility and social skills. All factor to factor correlations are shown in Table 4.

Table 4 Factor to factor correlations for the TRVQ

Factors	Dependability	Coping with the training environment	Quality of preparation	Distractibility	Ability to be coached	Social skills
Coping with the training environment	0.71					
Quality of preparation	0.85	0.72				
Distractibility	-0.46	-0.41	-0.41			
Ability to be coached	0.77	0.85	0.69	-0.26		
Social skills	0.67	0.61	0.53	-0.18	0.81	
Intensity of effort	0.81	0.68	0.65	-0.54	0.57	0.43

From the players data, Quality of preparation and Dependability had a very high factor-factor correlation loading 0.85. Consequently, a full factor model was run with these two factors combined to see what effect this had on the fit of the model. The result of combining the two factors worsened the overall fit of the model rather dramatically: (S-B χ^2 /df =

2471.719 / 309: P-value = 0.000: RMSEA = 0.151: SRMR = 0.212: NNFI = 0.782: CFI = 0.808). A very high factor - factor correlation was also noted between Coping with the training environment and Ability to be coached 0.85. These two factors were combined and a full factor model was run to examine the effect of this on the overall fit of the model. The combination of the two factors again rather dramatically worsened the fit of the model (S-B

x^2 /df = 2961.785/ 309: P-value = 0.000: RMSEA = 0.167: SRMR = 0.222: NNFI = 0.733: CFI

= 0.765).

Coaches Data

Alongside the TRVQ a second questionnaire, the training related variables-coaches
questionnaire (TRV-CQ) was also factor analysed. The TRV-CQ tapped into the same
factors as the TRVQ, but from the coaches' perspective. The same analytical strategy was
used. Single factor analyses were carried out on all the items of the seven constructs. The
initial results of these analyses are shown in Table 5.

Table 5 Initial Single factor analysis scores for TRV-CQ

Variable	S-B x^2	Degrees of freedom (df)	P-value	RMSEA	SRMR	NNFI	CFI
Dependability	23.45	9	0.00526	0.084	0.0425	0.975	0.985
Coping with the training environment	35.84	9	0.00004	0.114	0.105	0.858	0.915
Quality of preparation	93.46	9	0.00000	0.202	0.135	0.637	0.782
Distractibility	36.22	9	0.00004	0.115	0.0541	0.953	0.972
Ability to be Coached	30.42	9	0.00037	0.102	0.0808	0.938	0.963
Social Skill	100.79	9	0.00000	0.211	0.147	0.571	0.743
Intensity of effort	27.76	9	0.00105	0.095	0.0588	0.975	0.985

Each construct was examined to identify problematic items. Factor loadings, standardised
residuals, modification indices, and content of the item were again used as decision making
tools. The result of the single factor analyses reduced the TRV-CQ from a 42 item
questionnaire to a 31 item questionnaire. The final results of the single factor analyses are
shown in Table 6. All of the revised subscales demonstrated acceptable levels of fit
according to guidelines by Hu & Bentler (1999).

Table 6 Final Single factor analysis scores for TRV-CQ

Variable	S-B x^2	Degrees of freedom (df)	P-value	RMSEA	SRMR	NNFI	CFI
Dependability	5.41	5	0.36814	0.019	0.0305	0.999	0.999
Coping with the training environment	0.48	2	0.78767	0.000	0.0138	1.019	1.000
Quality of preparation	2.68	2	0.26175	0.038	0.0306	0.990	0.997
Distractibility	0.31	2	0.85492	0.000	0.0063	1.012	1.000
Ability to be Coached	2.60	5	0.76202	0.000	0.0225	1.012	1.000
Social Skill	1.84	2	0.39917	0.000	0.0261	1.004	1.000
Intensity of effort	0.87	5	0.97240	0.000	0.0096	1.009	1.000

The Full Model

Once an acceptable fit for the single factor models had been established a full model was then tested. The full model was tested to assess the fit of the overall structure and to highlight any poor or cross loading items. Examination of the fit statistics for the TRV-CQ revealed the model was an acceptable fit by some criteria and an unacceptable fit by other criteria, (S-B x^2/df = 1080.72/413: P-value = 0.0000: RMSEA = 0.084: SRMR = 0.113: NNFI = 0.954: CFI = 0.959). An S-B x^2/df ratio of 2.62, RMSEA of greater than 0.06 and, some high modification indices in the, dependability and, ability to be coached subscales, warranted a re- inspection of the model. An identical process to the TRVQ was followed with items being removed on the grounds of either empirical, or theoretical weakness, or both. Testing of the full model continued until the best fit statistics were arrived at (S-B x^2/df = 408.642/ 209: P-value = 0.0000: RMSEA = 0.064: SRMR = 0.0693: NNFI = 0.0.975: CFI = 0.979). The final results of the confirmatory factor analyses for the TRV-CQ are shown in Table 7.

Table 7 Final full model confirmatory factor analyses scores for TRV-CQ

Factor	Item	Factor loading	Cronbach's α
Dependability	He does what he says he is going to do in training	0.75	
	His reputation as a 'good trainer' is important to him	0.59	0.32
	In training we can rely on him to get the job done*	0.85	
Coping with the training environment	He always take onboard our instructions and suggestions	0.71	
	If we criticise him in training he works harder to do things correctly*	0.66	0.64
	When we tell him to do something differently he usually think we is trying to help him	0.33	
Quality of preparation	He completes his own cool down after each session	0.65	
	He is at the training session before he need to be*	0.43	0.58
	He mentally rehearses match situations a lot in training	0.75	
Distractibility	At times his mind wanders to non-rugby thoughts during training	0.88	
	He finds it difficult to maintain concentration throughout a training session	0.75	0.70
	He finds it hard to concentrate when something is explained during training	0.66	
Ability to be coached	He can usually understands what we are trying to do*	0.84	
	He is always ready to be coached	0.71	0.70
	He is open to new ideas	0.47	
Social skills	He gets frustrated at his own performance in training	0.85	
	He likes to get his own way*	0.37	0.61
	He makes an effort to engage with other members of the squad*	0.56	
Intensity of effort	If he is doing something he doesn't enjoy he tends to ease up a bit	0.90	
	He always tries his hardest in training	0.89	0.89
	He consistently works hard in training	0.84	

* Question which was excluded in the single factor analyses but re-introduced in the full model analyses.

Within the process of testing the full model six items were re-introduced which had been removed during the single factor analyses. All of these Items improved the fit of the full model when re-introduced in spite of being seen as weak items during the single factor analyses.

Factor - Factor Correlations

Bivariate correlations between the factors were examined. All factors showed positive correlations with each other with the exception of the distractibility factor which showed negative correlations with the other six factors. Positive correlation scores ranged from 0.64, between coping with the training environment and quality of preparation, to 0.99 between ability to be coached and social skills. Negative correlation scores ranged from -0.57 between distractibility and ability to be coached, to -0.72 between distractibility and dependability. All factor to factor correlations are shown in Table 8.

Table 8 Factor to factor correlations for the TRV-CQ

Factors	Dependability	Coping with the training environment	Quality of preparation	Distractibility	Ability to be coached	Social skills
Coping with the training environment	0.75					
Quality of preparation	0.88	0.64				
Distractibility	-0.72	-0.69	-0.68			
Ability to be coached	0.74	0.80	0.79	-0.57		
Social skills	0.79	0.82	0.85	-0.64	0.99	
Intensity of effort	0.86	0.76	0.79	-0.59	0.87	0.81

In the Coaches Factor-Factor correlations, Ability to be coached and, Social skills produced a remarkably high correlation of 0.99. A full factor model was then run with these two scales combined to investigate the effect of this combination on the fit of the model. However,

rather surprisingly, this resulted in a dramatically worsened overall fit (S-B χ^2/df =

896.270/170: P-value = 0.0000: RMSEA = 0.136: SRMR = 0.238: NNFI = 0.867: CFI =

0.893). A high factor - factor correlation was also noted between Dependability and Quality

of preparation 0.88. These two factors were combined and a full factor model was run to

examine the effect on the overall fit of the model. The combination of the two factors again

considerably worsened the fit of the model (S-B χ^2/df = 377.740/174: P-value = 0.000:

RMSEA = 0.077: SRMR = 0.0815: NNFI = 0.929: CFI = 0.941).

Discriminant Function Analysis

In reporting discriminant function analysis there appears to be no standard set of guidelines.
Field (2009) suggests reporting: the squared canonical correlation, the chi - squared
significance test, and the structure matrix scores for each factor. However, other
researchers frequently report the percentage of cases correctly classified and so are they
are also reported in this section. It is standard practice to consider standardised canonical
correlations of greater than 0.3 (Field 2009) as major contributors. Box's M is also reported
for both the TRVQ and the TRV-CQ because this tests one of the assumptions underlying
Discriminant function analysis. Outliers were identified from each set of data and removed.
When using Cronbach's α to report internal reliability of psychological constructs from
questionnaire based studies 0.7 is a generally accepted as an adequate cut off point (Field,
2000). The dependability scale, for the TRV-CQ showed a Cronbach's α score of 0.32. The
test for internal reliability may be difficult to improve upon because the scale contained only
three questions. If the dependability scale was the only scale being measured then the
internal reliability of the items would not be acceptable. Here, however, dependability is one
factor in a greater construct; training behaviours. Within the construct of training behaviours,
dependability shows some statistical rigour because of the factor loading for each question
and the goodness of fit statistics for the CFA. Miller, (1995) suggests that Cronbach's α
scores can underestimate test reliability. The underestimation of reliability is due to an
assumption with α that all items have an equal loading on each factor. Dependability shows
a strong factor-factor correlation with quality of preparation, when the two constructs are
combined the Cronbach's α rises to 0.72, thereby showing some support for Miller's position.

Players (TRVQ)

The analysis revealed a significant discriminant function. R^2 = 0.24, Λ = 0.756, χ^2 (7) =

75.53, p = 0.00. Four factors had standardised canonical correlations of greater than 0.3,

(Quality of preparation, 0.819: intensity of effort, 0.441: coping with the training environment, 0.426: dependability, 0.423). All structure matrix scores for the TRVQ are shown in Table 9.

Table 9 Structure Matrix score for the factors of the TRVQ

Factors	Structure Matrix Scores
Quality of preparation	0.819
Intensity of effort	0.441
Coping with the training environment	0.426
Dependability	0.423
Distractibility	-0.266
Social skills	-0.052
Ability to be coached	0.13

Box's M for the TRVQ was F approx. = 4.726: df1= 28.00, df2 = 245186.76, p = 0.000. Although Box's M was significant it was not seen as a major problem in the analyses because of the similarity of group sizes amateur = 149, professional = 126. Stevens (1979) suggest as long as the group size ratio is within 1:1.6 then a significant Box's M in not a problem. The percentage of items correctly classified for the players were: amateur = 65.8%, professional = 74.6%, Total = 69.8%.

Coaches (TRV-CQ)

The analysis revealed a significant discriminant function R^2 = 0.198 Λ = 0.801 χ^2 (7) = 39.18, p = 0.00. Four factors again had standardised canonical correlations of greater than 0.3, (Ability to be coached, 0.691: social skills, 0.553 intensity of effort, 0.491: dependability 0.313). Structure matrix scores for the TRV-CQ are shown in Table 10.

Table 10 Structure Matrix score for the factors of the TRV-CQ

Factors	Structure Matrix Scores
Ability to be coached	0.691
Social skills	0.553
Intensity of effort	0.491
Dependability	0.313
Quality of preparation	0.205
Distractibility	0.204
Coping with the training environment	0.193

Box's M for the TRV-CQ was F approx. = 2.335, df1 = 28.00, df2 = 112442.15 p = 0.000. Although Box's M was again significant it was not seen as a major problem in the analyses because of the similarity of group sizes amateur = 89, professional = 93. The percentage of items correctly classified for the coaches were: amateur = 71.9%, professional = 64.5%, total = 68.1%.

Discussion

Results overview
The factor structures for the two questionnaires (TRVQ and, TRV-CQ) were verified. Single factor analyses were completed on all seven of the scales on the TRVQ. After the removal of problem items, all seven scales gave a good fit, using the criteria set by Loo and Loewen (2002), Hu and Bentler (1999), and Steiger and Lind (1980). Following the removal of several more items, the full models also produced a good fits. Factor-factor correlations showed positive correlations between all the factors except distractibility, as would be expected. In an attempt to identify self-rated player characteristics that might classify successful and less successful rugby union players training behaviours, discriminant function

analysis identified quality of preparation, intensity of effort, coping with the training environment and, dependability, as discriminating factors.

Single factor analyses were completed on the TRV-CQ. All seven scales gave a good fit using the criteria set for the TRVQ. After having several items removed, all seven items gave a good fit using the criteria set by Loo and Loewen (2002), Hu and Bentler (1999), and Steiger and Lind (1980). Following the removal of several more items, the full models also produced a good fits. Factor to factor correlation showed the same relationships as for the TRVQ. A remarkably high factor to factor correlation between ability to be coached and social skill warranted the two factors being combined and another full confirmatory factor analyses being run. The resulting model gave a much poorer fit, so the two factors remained separate. In an attempt to identify characteristics that might classify successful and less successful rugby union players training behaviours from the coaches' perspective, discriminant function analyses were implemented on the TRV-CQ data. Results of the TRV-CQ revealed ability to be coached, social skills, intensity of effort and dependability, as discriminating factors in the coaches' opinion.

Theoretical implications Players

The players' rated of quality of preparation as the most important discriminating factor between successful and less successful rugby union players. Orlick and Partington (1988), in a qualitative study of Olympic athletes perceptions, identified important mental constructs quality training, simulation training, quality imagery, daily goal setting, etc; pre-competition planning; competition focus planning; competition evaluation procedures; and distraction control, under their title of 'learning the elements of success.' According to the players perceptions, the constructs identified by Orlick and Partington (1988) may also discriminate between successful and less successful rugby union players. Successful players could have experienced some or all of the constructs identified by Orlick and Partington (1988) under the banner of quality of preparation. Amateur players may never have been exposed to these constructs.

The players rated coping with the training environment as a discriminating factor between successful and less successful rugby union players in training. In a qualitative study of Olympic and World Championship athletes across seven individual sports, Durand-Bush and Salmela (2002) identified the need to cope on a daily basis as players are challenged physically, mentally, tactically and technically. Lazarus and Folkman (1984), and Folkman and Moskowitz (2004), identified coping effort and coping quality as necessary elements for success. Players who are successful may have better coping quality and effort. Nicholls et al. (2006) suggest that this may not be the case as the coping strategies they most

frequently recorded were not necessarily the most effective. In the present study, coping outcome is identified as important by the players, the best ways to do that however are not. The area of coping in the training environment is a possible future research direction.

Coaches

Coaches identified ability to be coached as the most important discriminating factor. Piedmont Hill and Blanco (1999) described the constructs of 'coachability' as listening and learning to apply the coaches' instructions. It would seem logical for this construct of the TRV-CQ to be seen as the most important by the coaches. Coaches would like players who are easy to work with, providing that they fulfil the necessary requirements to make the grade as a professional rugby union player. Quality of preparation, identified as the most important discriminating variable by the players, appears to have a natural correlation with the ability to be coached. Players who prepare well for training, prepare to listen, learn and apply the coaches' instructions are more easily coached, would seem a sensible starting point to explore. Two of the questions from the TRVQ: 'Go and work on their skills in their own time' and 'Mentally rehearse match situations in training' would allow players to be more coachable. A correlation between the two variables may be why these two variables were identified as the most important by the players and the coaches, i.e. players misinterpret ability to be coached as quality of preparation or coaches misinterpret quality of preparation as ability to be coached. There seems a logical indirect link between the players' interpretation of the construct and the coaches. If this was the case then a significant correlation might be expected between the players construct quality of preparation, and coaches construct ability to be coached. However, a correlation of $R^2 = 0.029$ was found. It appears that the coaches are looking for players who are easy to coach and easy to get on with, hence rating ability to be coached and social skills as discriminating factors between successful and less successful players. But the players do not recognise that this is what the coaches are looking for. Coaches identified social skills as a discriminating factor. Cote and Gilbert (2009) state, 'Coaches, like teachers, do not work in isolation their effectiveness depends on individual and group interactions'. They go on to describe coaching as 'a multidirectional conceptualization of coach athlete interactions which suggests coaching is a complex, reciprocally- influential process based on systems of social interactions'. Segrin and Taylor (2007) noted both effectiveness and appropriateness of communication in their description of social skills. Coaches will want appropriate communication from the player and effective communication to see improvement of skills. An indirect link may be drawn here between quality of preparation and social skills in that players who have prepared well for training may have the opportunity for more social interaction with the coaches. However, the correlation between players' ratings of quality of preparation and coaches' ratings of

social skills was R^2 = .0008. The result appears to show that coaches are looking for players with good social skills but the players do not recognise this.

Players and Coaches Different Perspectives

Both players and coaches identified intensity of effort as a discriminating factor between successful and less successful rugby union players in training. Durand - Bush and Salmela (2002) identified the increase in intensity and volume of training during the investment years. Jones (2006) also identified the increase in volume and intensity of training for Paula Radcliffe (current women's marathon world record holder). Intensity of effort would seem a logical discriminating factor between amateur and professional players as amateur players may not have been exposed to the intensity of effort necessary to succeed in order to achieve professional status or they may have been exposed somewhat and were unable to cope. Coaches at a professional level may expect a certain intensity of effort as a baseline standard. Both players and coaches identified dependability as a discriminating factor. Dependability seems closely related to conscientiousness, and Gould et al. (2002) identified all the elements of the conscientiousness definition by Costa and McCrae (1992) in their research with Olympic athletes. These elements were: purposeful, organised and achievement orientated. Dependability was also identified by Connor-Smith and Flachsbart (2007) as an element of better coping effectiveness. Woodman et al. (2010) found that conscientiousness interacted significantly and positively with quality of preparation when investigating training behaviours in high level gymnasts. The identification of dependability in successful players by both coaches and players. alongside the relationship it may have with quality of preparation (Woodman et al., 2010), and coping effectiveness, Connor- Smith and Flachsbart (2007) warrants further investigation.

It seems odd that players and coaches appear to disagree with each other on the important behaviours in training. In speculating on this point, players may not understand that it is how easy they are to work with that is important to the coaches at this level, rather than the traditional qualities of hard work, physical, mental and technical competencies which they have developed as they have risen through the system.

Applied Implications

As the players rated quality of preparation and coping with the training environment as discriminating factors between successful and less successful training behaviours, it would be useful for the players to develop skills and mechanisms which will allow them to become more skilled in these factors. These factors were not recognised as important by the coaches however. By helping the players develop skills and mechanisms around these

factors the coaches may improve the working relationship with the players and come to understand them better, so improving the coaches, interpersonal knowledge (Cote and Gilbert 2009) . An argument may suggest that coaches need not pay attention to the players, because the coaches select the teams, and it is in fact the players, who should pay attention to the factors the coaches identified as discriminatory. Players clear understanding of the factors the coaches rated as discriminatory would improve their likelihood of selection. Players may not be able to accurately report how good they are at ability to be coached or social skills, the factors which the coaches deemed as important. The players may not recognise the behaviours involved. The inability to accurately report these factors may mean the players regarded them as unimportant. The lack of recognition of these factors is, however, important because the players would be disadvantaged to whatever extent they are unaware of the behaviours the coaches consider important, as the coaches select the squads. Continued research into the misunderstanding and the misinterpretation of these constructs is warranted.

The coaches' ratings of ability to be coached and social skills were discriminating factors in determining successful and less successful training behaviours of rugby union players. In developing ability to be coached and social skills in the players it seems sensible to suggest that the players become 'easier to deal with.' Although these factors were not recognised as discriminating by the players, the players need to be aware of the factors selected by the coaches. In becoming 'easier to deal with' in the coaches eyes this may give the players more opportunities when being coached and then more opportunity of selection. Coaches may lack an understanding of what the players think is important. Coaches however may engender more commitment from the players if they help them with the factors they rated as discriminatory. The coaches and the players appear to have rated different training behaviours as discriminatory and so seem to emphasise different behaviours during training. In order to resolve this misunderstanding an education process may be started as the players enter the academy system so the players understand the behaviours the coaches rated as discriminatory.

Both players and coaches rated intensity of effort and dependability as discriminatory. Intensity of effort in training may be seen as a necessity for both the players and the coaches and elements of dependability as part of conscientiousness may be recognised by both, players and coaches, as essential in the progression to, and through the professional ranks.

Limitations

The current investigation was an exploratory study to identify if certain characteristics and training behaviours discriminate between successful and less successful rugby union players. During the CFA, a number of items were removed before the final analyses. Several of the factors were reduced to only three items on the TRVQ and all the factors were reduced to three items on the TRV-CQ. With this said, the overall factor structure of both the TRVQ and the TRV-CQ were good. Cronbach's α scores were low on several factors of both the TRVQ and the TRV-CQ, Streiner D.L., Norman G.R. (1989). Further development of these scales would probably improve the internal reliability scores, and continued testing of the questionnaire is necessary to achieve an improved balance between Cronbach's α and confirmatory factor analyses. In the present study, CFA was used in an essentially exploratory fashion. Ideally, confirmatory analyses should then have been performed on both the TRVQ and the TRV-CQ. However, the emphasis of this study was not to develop a measure for training behaviour but to discover if certain characteristics discriminate between successful and less successful players. As a generic questionnaire more work is necessary to develop the tool but, in the specific context it has been used here, it has been adequate. Definitions and operational definitions may also be further developed as research increases in this area. The coaches results may represent a 'self-fulfilling prophecy', i.e. it was interviews with coaches that led to the development of the factors for the two questionnaires. It would seem odd if the coaches had not discriminated ability to be coached as a factor for differentiating successful and less successful players.

Future directions for research in this area could follow several strands: further development of the TRVQ and the TRV-CQ through further confirmatory factor analyses. Studies of training behaviours currently have been based in specific sports, gymnastics, Woodman et.al. (2010) and rugby union. Further studies of different sports are worthwhile to obtain a more developed picture of the important characteristics. In particular, a more complete picture needs to be developed in the areas where the coaches and players disagree. Research considering how to improve the coaches views of what the players consider important and vice versa, can only improve the understanding and therefore will likely improve training standards in rugby union academies.

Study Three

Abstract

This study attempted to improve a group of professional rugby players' ability to be coached. Ability to be coached was the most discriminatory training behaviour identified by coaches. Two groups of professional players were asked to take part in the study (N=37). The first, the intervention group (N=20) were from a single professional club. The second, the control group (n=17) were from a second professional club. The intervention took place over a 12 week period in which the players in the intervention group and the control group were asked to complete The Training Related Variables Questionnaire (TRVQ) on three occasions. The three occasions were: week 0, as a baseline measure prior to the intervention; at week 6, half way through the intervention; and at week 12, at the end of the intervention. The coaches were asked to complete The Training Related Variables - Coaches Questionnaire (TRV-CQ) on the players at the same times. The intervention consisted of an educational workshop during week 0, to raise the awareness of the players to the sub-constructs of ability to be coached; readiness, openness, and understanding. The researcher then had ad hoc meetings with individual players and groups of players to discuss what the sub-constructs might look like in the context of their training. During week 6, a presentation was given by the researcher, and a brief survey taken, to reinforce the emphasis on the three sub-constructs. The researcher then continued with the ad hoc meeting for the next six weeks. A mixed model MANOVA was conducted on the players' data. Results revealed a significant group x time interaction for the training behaviours. Univariate follow ups revealed no significant differences for the specific variables. Independent t-tests were therefore used to try and find differences between the groups at each of the measurement points. The t-test results showed a significant difference for coping with the training environment at week 0, and for distractibility at week 6, A mixed model MANOVA was conducted on the coaches data. Results revealed a significant group x time interaction. Univariate follow ups revealed significant differences in coping with the training environment, quality of preparation, and distractibility. Bonferroni adjusted t-tests showed significant differences for coping with the training environment at week 0, and distractibility week 6. Any implications drawn from these results should be treated with caution as a series of confounding variables potentially disrupted the study.

<u>Introduction</u>

The current study implements an intervention which hopes to raise the awareness of the players to the most powerful discriminatory factor identified by the coaches in Chapter 3: ability to be coached. By raising the awareness of the players to this factor it was hoped that players would be able to improve performance in training and so increase their likelihood of being selected. It was also hoped that the standard of training in general would be raised giving the coaches a larger pool of players to select from.

In Chapter 3, coaches rated the players on training behaviours. The training behaviours were: dependability, coping with the training environment, quality of preparation, distractibility, ability to be coached, social skill, and intensity of effort. The results of Chapter 3 showed coaches considered ability to be coached as the most powerful discriminating variable between successful and less successful rugby players. In their interviews with Olympic champions, their coaches, and parents/siblings/significant others, Gould et al. (2002) also identified being coachable as a sub-theme of performance enhancement skills and characteristics. In that study, the construct of being coachable were not explored in any further detail but its recognition as a construct in successful athletes is important. In Chapter 3, ability to be coached was addressed by six questions. Following confirmatory factor analyses of the items three were removed. The three items that remained were:

1. He can usually understand what we are trying to do
2. He is always ready to be coached
3. He is open to new ideas

The themes of the three items, understanding, readiness, and openness, formed the basis of the planned intervention study. Understanding appears to be a difficult concept to define. Johnson-Laird (1983, 1987) describe understanding as; 'a mental state, a product of mental processes which infer relationships between elements of information'. Causal understanding is described by Krieger (1992) as, 'getting a handle on it and having a mental grasp of it.' The concept of 'grasp' allows people to explain or predict situations; however the link is not easy to establish (Newton, 1996). Zacks (2004) suggests that one way people may understand daily activities is by segmenting the activity in time, e.g. people may understand cricket better if they understand that the game consists of innings and overs. People segment on-going activities at salient boundaries, e.g. the end of the first half in a rugby match, or the end of a game or set in a tennis match. The result of this segmenting is that people perceive activity as a series of events. Each of these events has a location, a

beginning, and an end. The perceiver may use distinct sensory characteristics to delineate segments e.g. a bell in a boxing match. Dynamic movement features may act as a particularly powerful sensory characteristic e.g. the transition stage in a triathlon. A second way which a person may identify segments is by using knowledge structures, (Zacks 2004). Knowledge structures involve recognising the activity in progress and analysing it in relation to the knowledge previously possessed about the activity. Knowledge structures are also known as schemas (Bartlett, 1932).

The need to understand specific situations is central in many areas of knowledge. The need for professional rugby players to understand what a coach is trying to achieve in training is central to the success of the team. Figure 1 shows the process of understanding (Newton, 1996).
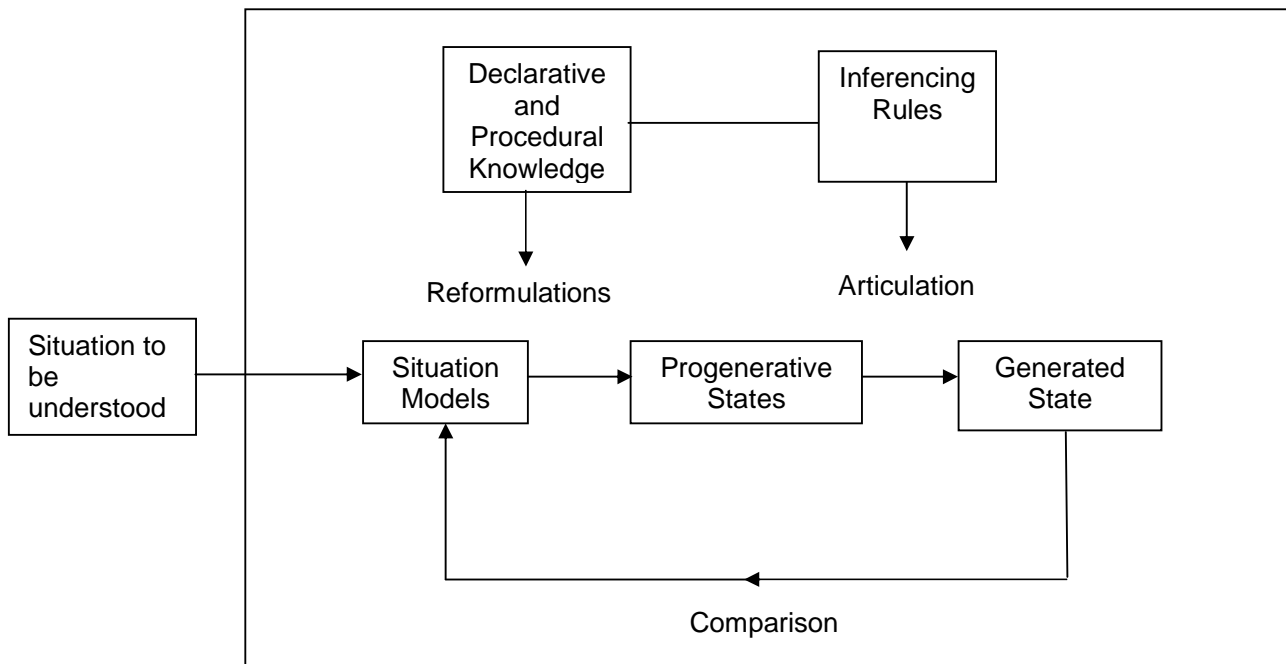
Figure 1 The process of understanding (Newton, 1996)

Declarative knowledge is being able to describe the aims of the task and why you are doing it. Procedural knowledge is specific understanding of the processes needed to complete a task. Procedural knowledge is specific to the task whereas declarative knowledge is more generalised. In complex situations it may be necessary to reconstruct and simplify mental models in order to achieve a successful outcome. The process of simplification or focusing on the salient features is represented in Fig.1, by the pro-generative states box. For rugby players this may involve focussing on the salient points of their role in a drill to begin with

rather than trying to take in the whole situation. Development of understanding the whole situation may come at a later stage. The whole situation may also be included at the beginning of the process. In many cases it is dependent on the complexity of the situation and the capability of the players. The process of running the simplified model or pro-generative state is known as articulation. Jarodzka et al. (2010), produced evidence that when visual cues are involved experts are more likely than novices to select and attend to the salient points involved. However, the knowledge structures needed to analyse the information and relate it to previous experiences will be an idiosyncratic process as every person's experiences will differ. The generated state is a position of understanding the situation having successfully run through the simplified models.

Within a sporting context, Orlick and Partington (1988) identified 'learning the elements of success' as an important factor in Olympic performance. These elements that were identified by Orlick and Partington were brought about by athletes listening to others and themselves, watching, talking, reading, experimenting, practicing, performing, thinking, experiencing, recording and evaluating. By allowing players to work through all or some of these elements it will give them the opportunity to increase articulation (Fig.1), and so increase the number of knowledge structures they possess, and increase their depth of understanding. Similarly 'always ready to be coached' linked closely to Orlick and Partingtons category of 'learning the elements of success'. They identified the training elements as: quality training, simulation training, quality imagery, and daily goal setting. All these elements were learned by athletes throughout their careers. Each of these elements could be seen as generated states, Fig.1. If rugby players improve their skills related to training by using the processes identified by Orlick and Partington then players will, not only, appear to be 'always ready to be coached' but will be better players, and so increase their chances of being selected.

In the coaching domain, Cote and Gilbert (2009) discuss three kinds of knowledge. The categories of knowledge they discuss are based on declarative and procedural knowledge (Anderson, 1982; Newton, 1996), but extend beyond those two constructs. Coaches' professional knowledge includes declarative knowledge in the sport sciences, sport specific knowledge, and accompanying procedural knowledge. Coaches' intrapersonal knowledge is described as understanding oneself and having the ability for introspection and reflection. Coaches' interpersonal knowledge is described as 'a multi-directional conceptualization of coach-athlete interactions.' Cote and Gilbert (2009), suggest it is important for coaches to develop this type of knowledge. Newton (1996) states, 'Understanding is not something which can be transmitted from the teacher to the student; the student has to do the

grasping.' Academics in the coaching domain seem to have an understanding of the knowledge process (Cote and Gilbert, 2009). Anecdotal evidence and the results from Chapter 3, suggest, however, the rugby players who are 'receiving' or 'grasping' the knowledge do not seem to have formal structures or processes in place to make the transfer as efficient as possible in training. Anecdotal evidence and the results from Chapter 3, suggest that coaches in the field have varying degrees of understanding of the knowledge process. 'Being open to new ideas', is a component of 'Ability to be coached'. Openness was identified by Costa and McCrae (1992), as one of the 'Big Five' personality characteristics. Costa and McCrae (1992) suggest that open individuals are 'willing to entertain new ideas and unconventional values', and because of this 'their lives are experientially richer'. Further to that they suggest that people who are closed are 'more comfortable with the familiar and have little incentive to try the new'. The very nature of trying to improve involves a process of change. Within professional rugby, skills, tactics, and strategies, change on an almost continuous basis as each team and coach tries to gain an advantage over opponents. Players who are open to change would appear more likely to be willing to adapt, as new demands are placed upon them. More closed players may be less willing to adapt to new demands. Studies from a variety of domains appear to concur on this point. People who are open tend to be more successful. There is considerable evidence to support the link between openness and success, openness and successful aging (Gregory, Nettelback and Wilson, 2010); openness and professional comedians (Greengross and Miller, 2009); openness and learning (Zhang 2003). In a meta-analysis by Judge and Ilies (2002) which studied the relationship between personality and performance motivation, openness was found to be a significant predictor of goal-setting and self-efficacy and motivation. Driskell et al. (2006) identified flexibility as a sub-construct of openness and suggested that it is 'critical in interdependent behaviour'. The nature of a large team sport involving open skills would suggest that players who are open will increase their chances of selection because they are able to accept new ideas, and demonstrate flexibility in their behaviour.

The intervention will focus on readiness; openness and understanding and this will benefit the ability to be coached of the rugby players who receive it.

Method

Two groups of professional rugby players were identified and asked to take part in the study. One group formed the intervention group and the second a control group. Players in both groups were asked to complete the Training Related Variables Questionnaire (TRVQ) on a six weekly basis. At the same time, the coaches were asked to complete the Training Related Variables - Coaches Questionnaire (TRV-CQ) on the players.

Participants

A total of 37 professional rugby players participated in this study. The intervention group were drawn from players from a single club in the Superleague (N = 20). The age range of these players was 20-35 years (M = 26.75, S.D. = 4.59). The control group were drawn from a single club in the Co-operative Championship (N = 17). The age range of the players in the control group was 20-34 (M = 25.20, S.D. = 4.62). Although drawn from different divisions both sets of players are professional. In this study, players were not randomly allocated to an intervention or control group because of the closeness with which the players in each club train. Practically, it would be impossible to prevent cross contamination from the intervention group to the control group within a single squad of players.

Instrumentation

The training related variables questionnaire (TRVQ) is a 27 item questionnaire which was completed by all players. Players respond to each of the 27 items on a Likert scale, by rating items from 1to 9 anchored by (1) 'strongly agree' and (9) 'strongly disagree'. The 27 items are designed to tap seven different training behaviours: dependability; coping with the training environment; quality of preparation; distractibility; ability to be coached; social skills; and intensity of effort. Following confirmatory factor analysis in Chapter 3 (CFA; S-B χ^2/df =

616.10/303: P-value = 0.0000: RMSEA = 0.058: SRMR = 0.0707: NNFI = 0.965: CFI = 0.970), the TRVQ showed adequate factor loadings for each of the items (M = 0.62, SD = 0.24). Internal reliability scores (Cronbach's α) were computed for each of the constructs: dependability (0.70); coping with the training environment (0.58); quality of preparation (0.62); distractibility (0.71); ability to be coached (0.70); social skills (0.70); and intensity of effort (0.84). Five of the seven constructs were found to be above the generally accepted threshold (α > 0.70; Hammond 1995), with two, coping with the training environment and quality of preparation, being below the threshold.

The training related variables – coaches questionnaire (TRV-CQ) is a 21 item questionnaire that taps the same seven constructs of training behaviour as the TRVQ, from a coaches'

perspective. The TRV-CQ rates the coaches' perceptions of the players' behaviour. The 21 items are designed to tap seven different training behaviours: dependability; coping with the training environment; quality of preparation; distractibility; ability to be coached; social skills; and intensity of effort. Following confirmatory factor analysis in Chapter 3 (CFA; S-B χ^2/df = 408.642/ 209: P-value = 0.0000: RMSEA = 0.064: SRMR = 0.0693: NNFI = 0.0.975: CFI = 0.979), the TRV-CQ showed adequate factor loadings for each of the items (M = 0.68 SD = 0.17). However, internal reliability scores (Cronbach's α) showed three of the seven constructs were below the accepted threshold: dependability (0.32); coping with the training environment (0.64); quality of preparation (0.58); distractibility (0.70); ability to be coached (0.70); social skills (0.61); and intensity of effort (0.89). The very poor internal reliability score of dependability led to consideration of removal of this variable. To examine the effect the removal of dependability would have on the remaining items a confirmatory factor analysis (CFA) was performed on the original data from Chapter 3 with dependability removed. However, the CFA (S-B χ^2/df = 386.914/120: P-value = 0.0000: RMSEA = 0.085: SRMR = 0.0774: NNFI = 0.95: CFI = 0.96) revealed that the removal of dependability significantly worsened the fit. Furthermore, the low internal reliability scores may be due to the low number of items in each variable (Miller, 1995). Consequently, all subscales were retained, although findings for dependability needs to be viewed with considerable caution.

Procedure

The participants in the intervention group were told the purpose of the study, which was to enhance the training behaviours of the participants by ameliorating the components of 'ability to be coached'. The players were told any information they gave would remain confidential. The study period lasted 12 weeks and was divided into three phases: baseline measurement, intervention, and post intervention. Initially, baseline data were collected using the TRVQ (week 0). Training behaviour data were collected from the participants in the intervention group, using the TRVQ once every six weeks, during the intervention phase (two data collection points; week 6, and week 12). The intervention lasted 12 weeks and was introduced to the participants using an education workshop (see Appendix 4). This was supported by a presentation six weeks later (see Appendix 5, coaches names have been removed). Individual discussions with participants took place throughout the intervention phase. Training behaviour data were collected from the coaches in the intervention group, using the TRV-CQ during the baseline measurement phase, once every six weeks during the intervention phase (two data collection points; week 6, and week 12). Training behaviour data were collected from the players in the control group, using the TRVQ, every six weeks during the intervention phase (two data collection points; week 6, and week 12). Training

behaviour data were collected from the coaches in the control group, using the TRV-CQ every six weeks during the intervention phase (two data collection points; week 6, and week 12).

Pilot Workshop

Prior to the intervention the author conducted a pilot version of the educational workshop planned with the participants. The pilot workshop was conducted with a group of undergraduate coaching students. The students were asked to discuss the construct of 'ability to be coached'. The components of readiness, openness, and understanding, formed the basis of the discussion areas. The students were asked how they would expect players to demonstrate each of the components and give examples of the behaviours they would associate with each one. Each of the component discussions were initiated by a slide and a definition for that component e.g. 'readiness: completely prepared or in fit condition for immediate action': 'openness: open to change, open to new ideas': 'understanding: knowledge of or familiarity with a particular thing; skill in dealing with or, handling something.' Timing emerged as a possible cause for some concern as the students were able to discuss readiness and openness for an hour each, whereas understanding appeared to be more difficult to discuss and the process was much shorter. The researcher was allocated 90 minutes to conduct the workshop with the participants. At the end of the pilot workshop the students were asked to rank the three components in order of discussion difficulty. The student's ranked readiness as the easiest to discuss followed by openness and understanding. From this, the researcher decided to place the understanding component between the readiness and the openness components in the discussion order. Placing readiness first, the easiest component, would allow the participants to familiarise themselves with the process before moving to the more difficult component of understanding. The discussion led to the introduction of what the absence of readiness and openness looked like. It was felt that a descriptor of the absence of the behaviour would give the players another opportunity to describe the actions. An absence question was added to the slide e.g. 'What does it look like when you are not ready to train?'

As part of the intervention process the researcher spent as much time as possible with the participants to familiarise himself with the participants and the club. The time spent with the participants was on average between 2 to 2.5 days per week, for 12 weeks. The time varied each week due to the nature of the training programme set up by the coaches e.g. some weeks, the players' days off maybe a Tuesday and a Wednesday and other weeks it may be a Friday and a Saturday. Outside professional commitments of the researcher also became a factor in the amount of familiarisation time that was spent with the participants. During the intervention process the author got involved in some training sessions, and generally

assisted the players and coaching staff. The authors involvement involved completing some of the running drills with the players, helping coaching staff identify training venues, feeding balls into skill sessions, and entertaining one of the players children whilst they trained on one occasion.

Intervention

The participants educational workshop was based around the three components of the 'ability to be coached' construct: understanding, readiness, and openness. The workshop began with a brief presentation on how the researcher had arrived at the three items which were being discussed. In small groups, the participants were asked to think about and discuss how they could demonstrate each of the components during training. The participants were asked to consider what the absence of the behaviours for each component would look like. At the beginning of the group discussion process the researcher used prompting questions to initiate the small group discussions e.g. 'In a training session how would the coach know you are ready to start?' The small groups were asked to write down the ideas they produced. Each of the small groups of players produced ideas, thoughts and behaviours about each of the components. The ideas, thoughts and behaviours that were produced were then themed together to produce common higher order themes. These higher order themes were collated into a list by the researcher. It was explained to the participants that the list they had produced would form the basis of future discussions. At the end of the workshop the participants were told that the researcher would be available to discuss the points on the list at any time. No regular slot in the player's weekly training calendar was formally given to the researcher. He simply attended as many of the training sessions as possible and worked with the players on an ad hoc basis as opportunities arose. The total number of sessions the researcher attended was 26. Discussions with individual participants took place prior to, during and after the 26 training sessions over the 12 week period.

In the week following the educational workshop four of the participants initiated discussions with the author around the themes of training. These four participants engaged regularly with the researcher to discuss training and other issues. The author initiated discussions with two other individuals around the training theme. The rest of the participants were engaged in small groups during training sessions in the weights room. During this week all the participants were spoken to either individually or in the weight lifting groups they were assigned to. The weightlifting groups consisted of four or five participants and were rotated into the weights sessions by the strength and conditioning coach. Each week a similar process was undertaken by the researcher with levels of engagement varying by the

participants. In the researcher's opinion, approximately 80% of the participants were willing to engage with him in general discussions about ability to be coached. Approximately 20% of the participants appeared reluctant to engage with the researcher beyond superficial chat. Of the 80 % of participants who did engage with the researcher, five participants wanted to know how they could improve their training. These discussions were about how the training they did made them better participants and if they understood the link between strength and conditioning and their improvement. They wanted to know how they could prepare for training and what this would do to improve them as players. The emphasis in this block of training was very much on strength development, conditioning, and skill development. After six weeks of training the emphasis of the players' programme changed. In the second six week block the emphasis was placed on speed and tactics. The skill development remained.

At the beginning of the second six week block, the researcher reinforced the components of 'Ability to be coached'. The researcher produced a set of questions for the participants to score themselves on. The questions were based on the components of 'Ability to be coached' and 'Social skills', from the TRVQ. 'Social skills' were introduced at this point because of its remarkably high correlation with 'Ability to be coached', (r = 0.99). 18 participants from the intervention group were approached with the eight questions from the TRVQ. The participants were asked to rank themselves 1-8, (1) being the best training behaviour and (8) being the worst. The participants ranked themselves and the researcher collated the results. The results revealed the participants identified 'I consider other peoples opinions' as the component they ranked as the worst. Using this information a presentation was given about whose opinions may need to be considered and why considering other people's opinions is important. In the training environment the opinions of the coaches was considered important. Issues raised by the coaching and support staff around the training environment were integrated into the presentation, as examples of what those opinions were. The five main issues raised by the coaching staff were firstly: the provision of data by the players without being chased up for the information. Secondly, a list of daily tasks the players needed to, and were expected to complete. Thirdly, the number of missed appointments and the number of times players rang to confirm appointments were presented. Fourthly, the fines accrued by the squad for missing appointments and lateness were gathered by the researcher and presented. Finally, questions around the first minutes of training sessions and matches regarding poor skills and scoring first. Following the presentation a discussion around these issues and how they linked to the components of 'Ability to be coached', ensued. At the end of the discussion it was agreed by the participants to pay special attention to the first five minutes of every session, the participants

coined the phrase 'setting the standard at the start of each session'. A goal of no fines was set for the following week. By completing this goal successfully they would have succeeded in completing issues one and three as these were finable offences. The researcher went on to emphasise the need for quality training and attention to detail rather than quantity of training. At the end of the presentation the researcher emphasised he was available to discuss points that had been raised in the presentation. During the second six week block the same four participants continued to engage with the researcher and were joined by two more, who regularly spoke about training and other issues. The rest of the group were engaged by the researcher during the small group weight lifting sessions and other sessions. The overall engagement remained at about 80%.

Prior to the participants' week 6 workshop the coaches were asked to complete the TRV-CQ. Following the completion of the TRV-CQ an education workshop was produced for the coaches. The coaches' workshop began with the same presentation about how he had arrived at the items which were selected for attention with the participants. It was elucidated, to the coaches how the researcher was going to emphasise the components of 'Ability to be coached' to improve the training behaviours of the participants. It was described to the coaches how the participants had identified behaviours under each component, readiness, openness, and understanding, which the participants regarded as important in improving training behaviours. The list the participants had produced was then given to the coaches and they were asked for their comments. The coaches were then asked if they would like to add any more behaviours to the list. They chose not to add any. Following a discussion about the list with the coaches, the researcher asked for ways the coaches thought they could help the players improve their training behaviour using the construct of 'ability to be coached' and its components readiness, openness, and understanding. Following the presentation and discussion, with the participants, at the beginning of the second, six week block of training the researcher approached the head coach. The researcher asked the head coach to include key words and phrases into the review sessions he did with the participants. The key words and phrases selected were from previous discussions with the players, e.g. 'Setting the standard at the start of each session.' The head coach was happy to do this and included phrases and words into his review sessions.

The players in the control group were asked to complete the TRVQ at the same time as the participants i.e. at the beginning of the first, six week block of training; after the first, six week block of training; and after the second, six week block of training. Between each data collection the researcher had no contact with the players in the control group. The same procedure was followed for the coaches in the control group with them completing the TRV-

CQ at weeks 0, 6 and 12.Following the completion of the intervention period the participants were left to continue training without the researcher present.

Analyses

Two mixed model MANOVA's were performed on the data collected, one on the player's data and the second on the coach's data. The study investigated a genuinely multivariate hypotheses i.e. some linear combination of the variables, (dependability, coping with the training environment, quality of preparation, distractibility, ability to be coached, social skills, and intensity of effort) may be effected by the intervention on training behaviours. In the case of the players' data a significant time and group interaction was found. However univariate follow ups revealed no significant differences. To try and find another way to explore the significant interaction effect, Independent t-tests were then used to identify differences between the groups at each collection point. The coach's data followed a more traditional line as both the MANOVA revealed a significant group x time interaction and the univariate follow ups exposed significant differences in specific variables. More traditionally, a Bonferroni adjustment was the employed to perform the multiple comparisons tests.

Results

Two factor mixed model MANOVAs were used to examine if the psychological based intervention had a significant effect on the training behaviours of professional rugby players. Seven aspects of training behaviour (dependability, coping with the training environment, quality of preparation, distractibility, ability to be coached, social skills, and intensity of effort) were measured at three time points over a 12 week period (week 0, week 6, and week 12). Two groups of players were selected from two different professional rugby clubs one as an intervention group and the other as a control group. Data was collected from both groups at six week intervals for the duration of the intervention. A mixed model MANOVA using Wilk's Lambda (Field 2009) revealed a significant group x time interaction on player rated training behaviours, Λ (29, 7) = 0.24, p = 0.009, (see Appendix 6).

Follow up univariate ANOVAs were conducted on each of the seven constructs to examine significant differences within each of the seven training behaviours over time and between groups. However, none of these revealed any significant interactions for any of the variables, and none of the interaction effects approached significance (see Appendix 9). Consequently, in order to identify what had caused the group x time MANOVA interaction, independent t-test were used to examine differences between groups at each data collection point (week 0, week 6, and week 12). Results revealed no significant differences for dependability, distractibility, ability to be coached or intensity of effort. However, a significant difference

between groups was found for coping with the training environment at week 12 (t (37) = -2.54, p = 0.015; intervention group M = 6.66, SE = 0.21, and control group M = 7.38, SE = 0.17), indicating that the intervention group coped more poorly than the control group at this time point. A significant difference between groups was also found for quality of preparation at week 6 (t (37) = 2.06, p = 0.046; intervention group M = 5.94, SE = 0.23, and control group M = 5.33, SE = 0.16), indicating that the intervention group prepared better than the control group at this time point. Finally, a significant difference between groups was found for social skills at week 12 (t (37) = -2.24, p = 0.031; intervention group M = 7.45, SE = 0.26, and control group M = 8.19, SE = 0.16, indicating that the intervention group was again less socially skilled than the control group at this time point, (see Appendix 10).

Significant main effects between groups were found for two of the variables; coping with the training environment F (df, 1, 35) = 4.196, p = 0.048, and social skills F (df, 1, 35) = 8.759, p = 0.005, (see Appendix 7).

None of the univariate ANOVAs, showed significant main effects over time. However, for two constructs, the main effect for time approached significance: coping with the training environment F (df, 1.66, 58) = 0.029, p = 0.065; Social Skills F (df, 1.41, 49.53) = 0.029, p = 0.053, (see Appendix 8).

A two factor mixed model MANOVA was used also to examine if the psychological based intervention had had a significant effect on the training behaviours of professional rugby players as perceived by the player's coaches. The same training behaviours were measured at the same three time points, during the same 12 week period by the coaches. Four coaches from the intervention group completed the TRV-CQ and two coaches from the control group completed the TRV-CQ. The mean scores of the coach's ratings were taken across the seven constructs before analysis. Pearson's correlations were used to test the reliability between the coach's assessments. The results of the correlations revealed strong correlations between the four coaches in the intervention group. Coach's 1 and 2; r = .96, (p < 0.001). Coach's 1 and 3; r = .99, (p < 0.001). Coach's 1 and 4; r =.71, (p = 0.01). Coach's 2 and 3; r = .98, (p = 0.00). Coach's 2 and 4; r = .67, (p = 0.018). Coach's 3 and 4; r = .64 (p = 0.026). The results for the control group revealed a moderate correlation. Coach's 5 and 6 r = .50 (p = 0.098). However, it is almost certainly the case that the mean of these two coaches' ratings would be much more reliable.

A mixed model MANOVA using Wilk's Lambda (Field 2009) revealed a significant group x time interaction, Λ (26, 7) = 0.27, p = 0.010, (see Appendix 11). Follow up univariate

ANOVAs were conducted on each of the seven constructs to examine significant differences within each of the seven training behaviours over time and between groups. Univariate ANOVAs on the group x time interaction revealed significant differences for: coping with the training environment F (df, 2, 64.00) = 0.031, p= 0.016; quality of preparation F (df, 1.434, 45.90) = 0.031, p = 0.042; and distractibility F (df, 2, 64.00) = 0.031, p = 0.004 (see Appendix 14).

In order to identify what had caused the group x time MANOVA interaction, a Bonferroni adjusted (0.05/ number of dependent variables) independent t-test were used to examine differences between groups at each data collection point (week 0, week 6, and week 12) an alpha level of 0.0167 was adopted. The Bonferroni adjustment was adopted to control for Type 1 errors when using multiple comparisons (Vincent 1999). Results revealed significant differences for coping with the training environment at week 0; (t (41) = -2.50, p = 0.003), intervention group M = 6.75, SE = 0.31, and control group M = 7.83, SE = 0.18).
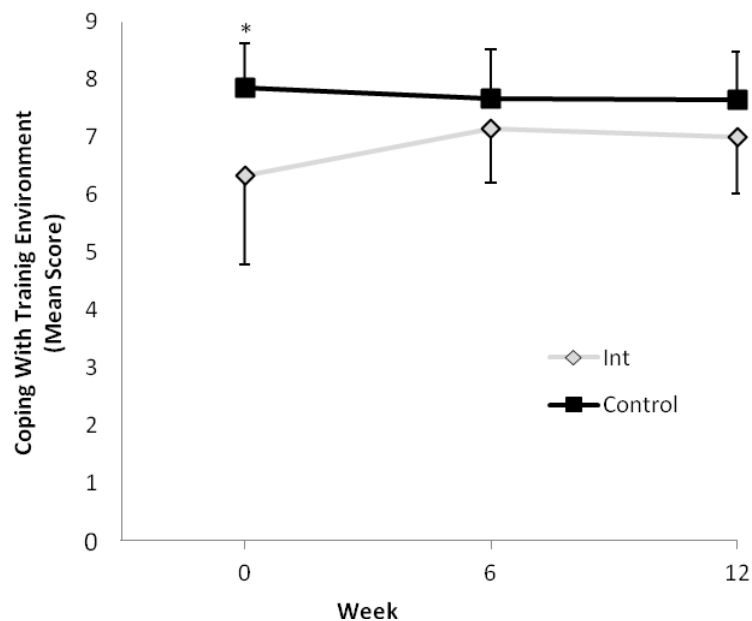
Figure 2 Graph to show mean coping with the environment scores over the 12 week intervention period.

* P=0.003

Distractibility at week 6; (t (34) = 2.56, p = 0.0075), intervention group M = 6.65, SE = 0.34, and control group M = 5.37, SE = 0.37.
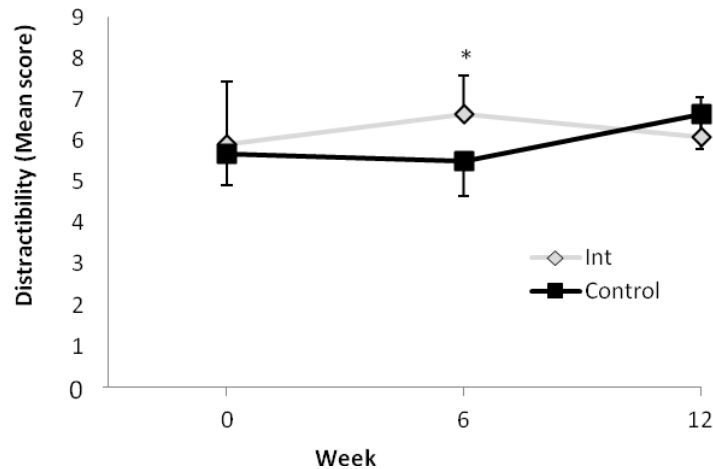
Figure 3 Graph to show mean distractibility scores over the 12 week intervention period
* P=0.0075

Quality of preparation, although not significant did show a distinct improvement at week 6; (t (34) = 1.075, p = 0.145), intervention group M = 6.17, SE = 0.22, and control group M = 5.85, SE = 0.18 (see Appendix 15).

Significant main effects between groups were found for coping with the training environment F (1, 32) = 8.851, p = 0.006. Main effects for social skills between groups approached significance F (1, 32) = 3.679, p = 0.064 (see Appendix 12). Significant main effects over time were found for ability to be coached F (1, 32) = 6.628, p = 0.002 (see Appendix 13).

<u>Discussion</u>

In the light of the results being counter to the hypotheses, the discussion will focus on the variables with significant results first, followed by the results obtained for the hypothesised variables second. Coaches and players results are integrated and implications drawn. Any implication drawn at the applied level should be treated with caution because of limitations identified with the study. Future directions for research are offered. The intervention followed two professional rugby teams for the final seven weeks of their preseason training and the first five weeks of training once the season had started.

Results Overview

Two factor mixed model MANOVAs were used to examine a psychological based intervention into training behaviours in professional rugby players. Seven training behaviours were measured (dependability, coping with the training environment, quality of preparation, distractibility, ability to be coached, social skills, and intensity of effort), over a 12 week period at six week intervals. Data were collected from both the players and the coaches at the same data collection points. Using Wilk's Lambda, the players' MANOVA, revealed a significant group x time interaction. Follow up univariate ANOVA's for each of the seven variables revealed no significant differences for the player's data. However, two of the variables did approach significance, coping with the training environment and social skills. Between groups t-tests were therefore carried out on these two variables in an attempt to identify the source of interaction. Results suggested that quality of preparation was better in the intervention group at week 6, but coping with the training environment and social skills were worse in the intervention group at week 12.

The coaches' data also revealed a significant group x time MANOVA interaction. Univariate ANOVAs revealed significant differences for coping with the training environment, quality of preparation, and distractibility. Between groups Bonferroni adjusted t-tests were used at weeks 0, 6, and 12 to identify the source of the interaction. Two of the variables measured revealed a significant difference. These suggested that from the coaches' perspective, the intervention group was worse at coping with the training environment at week 0 and more distractible at week 6. The coaches recognised a distinct improvement in the quality of preparation although this was not significant. The coaches' results suggested that the players in the intervention group had poorer coping skills than the control group at the beginning of the intervention. The coping skills of the players improved then from week 0 to week 6 as the intervention proceeded. The players' results suggested that the intervention

group thought they had adequate coping skills at week 0 and week 6, but these coping skills had worsened by week 12.

According to Lazarus and Folkman (1984), coping is defined as the changing thoughts and actions that are needed to manage the specific environment of that the person defines as stressful. In Lazarus and Folkman's transactional framework, coping is seen as a response to stressors, i.e. the person cognitively evaluates the situation (primary appraisal) and then evaluates what can be done to resolve the situation (secondary appraisal). There is no attempt to pre-empt the stressor in this framework and so remove the stressor before it may occur. Processing efficiency theory (Eysenck and Calvo 1992) suggests that effectiveness and efficiency are the dimensions that should be used to evaluate the success of episodes involving engagement with stressors. Effectiveness refers to the quality of task performance indexed by standard behavioural measures. Efficiency refers to the amount of effort or resource needed to complete the task and its relationship to effectiveness. According to processing efficiency theory the effects of stress may have greater effects on processing efficiency rather than on performance effectiveness (Eysenck et al. 2007). In the case of the coaches recognising poor coping skills in the players, several reasons can be put forward to support this idea. The demand of the physical training needed at the beginning of pre-season training could have caused stress. The players' were often required to attend three sessions per day with the first group beginning at 6am. The demand placed on the players is similar for both the intervention and the control group but, the arrival of a new strength and conditioning coach may have caused extra stress for the intervention group as the players got used to a new way of working and different expectations.

Woodman and Hardy (2001) identified coaching styles and coaches as a source of stress. Six of the players were in dispute with the club regarding financial matters from the previous season. These players arrived at pre-season training with these issues still on-going. Players were having daily discussions with the coach, whom they saw as the club's representative, but, who in fact had no power to change the situation. These continuous discussions may have been reflected in the results of the coaches at week 0. Eysenck et al. (2007) suggest effectiveness of coping as a way to resolve issues. The coaches may have recognised poor performance effectiveness in the players as the pension issue was repeatedly raised. Contracts for several players in the intervention group were also still in debate and several players were still to arrive either from other clubs or from overseas. The discussion of all these factors, daily, could have been interpreted by the coaches as reflecting poor coping skills of the players.

Woodman and Hardy (2001), identified finances as source of stress under a group of issues they labelled environmental. Coaches then felt that the coping of the intervention group improved as the differences at week 6, and 12 were not significant. Although the major financial issue was not resolved, it was progressing. Contracts and issues regarding players arriving in the intervention group were also resolved. Players usually settle into the rhythm of pre-season training and training within the season. At week 12, with the intervention group were on a poor run of results, the coaches still felt the players were coping better than at week 0. The coaches deal with the players on a daily basis and tended to compartmentalise the season into individual weeks. The coaches only looking as far forward as the next game may have helped the players to cope with the training environment. In this situation there appeared to be so much going on which was beyond the power of the coaches that working in single week blocks may have allowed the coaches to try and control their environment as much as possible. The coaches were still driven by results on the field. The number of disputes going on with the control group was unknown by the researcher. However during the time the researcher was collecting data with the club one player was sacked.

The coaches' results also revealed a significant main effect for time for ability to be coached in the intervention group. The improvement in this variable over time may indicate the players were coming to terms with the new coaching staff and so understanding, readiness, and openness were improving. The lack of significance between the two groups may suggest that this process is to be expected in the pre-season period as the players and coaches spend more and more time together. The time spent together may allow the players to understand what it is the coaching staff are trying to achieve in more detail. Effects of strength and conditioning programmes may give an opportunity for the three sub-constructs to develop e.g. As the players see themselves getting stronger and faster their confidence in the coaches may rise and so the players may be more open or ready to try new ways of working.

The players' own perceptions of their coping appeared to follow an opposite pattern. According to the players in the intervention group, they were coping, better at week 0 where there was no significant difference between the intervention and the control group, and similarly at week 6. However at week 12 the intervention group were significantly worse than the control group. Most of the players were experienced professional players and understood the commitment needed to complete pre-season training. At this point in time, there were no external comparisons e.g. matches. It appears that the player's perceptions are far more driven by results than the coaches because it is in week 12, after a run of 6

defeats, which the players identify that they are not coping as well. The point of not coping may have arrived anywhere between week 6 and week 12. Several incidents happened during that period which may have been examples of the players beginning to cope less well. One player was suspended from training for a seven day period following a dispute with the coach (cf., Woodman and Hardy, 2001). Later in the period, seven players from the intervention group were reprimanded for breaking curfew.

The players' perceptions of their social skills in the intervention group followed a similar pattern to coping, with week 12 being recognised as a time when social skills got worse. The apparent fall in the social skills of the intervention group may have occurred in conjunction with the intervention groups struggle to cope. Segrin et al. (2007) suggested that high social skills could act as moderator in forming lower perceptions of stress. Social skills may also contribute to the 'team' element of stress issues identified by Woodman and Hardy (2001). They identified; team atmosphere, support networks and communication all of which would appear to be enhanced by high social skills. Coaches did not detect any change in social skill throughout the 12 week period.

The players recognised quality of preparation as significantly improving in week 6, at the end of the pre-season training period. The players were preparing for the first game of the season, so pre-competition planning and competition focus planning were prominent. The training had more emphasis on the tactical elements than the physical elements during the first 6 weeks of the intervention. Prior to the week 6 data collection, the researcher had completed a presentation with the players focusing on attention to detail and the quality of the first five minutes of the training. The emphasis of the presentation may have raised awareness of the players towards quality of preparation. Alongside this two of the quality of preparation questions were 'I use training to practice what I would do in a match' and 'I mentally rehearse match situations I do in training'. The week 6 questionnaire was completed just before the beginning of the season and so the two references to 'match' may have had an effect on the player's responses as the first game of the season was very close. Coaches' univariate follow up tests revealed quality of preparation as a significant variable. However further detailed analysis using Bonferroni corrected independent t-tests did not identify significant differences between groups at any time point. Although quality of preparation showed no significant difference in the t-tests there was a distinct improvement at week six by the intervention group. The improvement at week six may suggest the players were becoming accustomed to the new methods of coaching implemented by the coaching staff and were making a concerted effort as the beginning of the season approached.

Coaches assessments revealed a significant group x time interaction for distractibility. for the intervention group. Further investigation identified a significant difference at week 6, with the intervention group being more distracted than the control group. According to Orlick and Partington (1988), distraction control differentiates between successful and less successful Olympians. New events off the field had risen at this point; two of the players in the intervention group had been asked to leave the European Union until their visa situations had been put in order. The players were assured the overseas players would soon return and that the cause had been an administrative error. These two players were missing from training for three weeks. The players, who remained, were in daily contact with the players who had been asked to leave. The players' distraction may have had several sources; the removal of the players from the European Union initially, several other players worried about their visas; the daily contact between the remaining players and the players who had been removed; the assurances from the coaching staff that the issues about visas was being resolved, the players may have become sceptical about the coaches when dealing with issues away from the training environment; and the length of time the players were away. Communication was identified as a potential source of stress by Woodman and Hardy (2001).These events came at a time when the players may have felt under acute pressure as selection for the first game was imminent. Selection was identified by Woodman and Hardy (2001) as a source of stress. The combination of these events may have led to the coaches identifying the players as distracted.

The primary aim of the intervention was to try and improve the training behaviour ability to be coached. Ability to be coached was broken into three sub-constructs; readiness understanding and openness. In the analysis, no significant difference was found in either the players' or the coaches' perceptions of ability to be coached for the intervention group during the 12 week intervention period. Social skills, which were strongly correlated with ability to be coached (see Table 8), worsened at week 12 according to the players. It appears that the players in the intervention group were trying to cope with the difficult situation they found themselves in. In this case, the possibility of improving other areas of training behaviour was remote, e.g. trying to improve openness is very difficult when several of the players are in dispute with the club, or the coach, or have been asked to leave the European Union. This sort of situation has an effect not only on the players involved but also on the rest of the squad. Allied with this, when the season began the team was on a losing run of results. Other than trying to cope with all this, which by week 12 the players, in the intervention group, appear to have recognised they were not doing well, the primary objective of the intervention was not achieved.

All applied implications drawn from this study must be treated with caution. A number of previous researchers have suggested that coaches and players should strive to open communication channels between themselves e.g. Yukelson (1997), who concluded coaches should strive to get to know players as unique individuals, clarify role expectations, set aside time for team meetings, and establish a players counsel. Cote and Gilbert (2009) suggest the importance of interpersonal knowledge. They describe this knowledge as 'a multidirectional conceptualization of coach- athlete interactions'. Both players and coaches must be open to the other, so issues may be resolved as they arise; e.g. what can the coaches do to help the players cope better at week 0 and how can the players approach the coaches with issues at week 12? The opportunity for this discussion needs to be created for individuals or on a team level, or both. As Yukelson (1997) suggests several levels of communication should be made available to the players so they can select the easiest way to discuss issues with the coaching staff.

Segrin et al. (2007) suggest that positive relationships are developed by; trust, openness, concern, and connection. The results of this study seem to have been distorted by a series of events which took place away from the training environment: pensions; visas; coach player disputes; breaking curfew. The systems at any professional club need to be in place, and be robust, in order to support the players away from training. Cote et al.'s (1995) coaching model defined the main components of a high performance environment. They found the overall goal of the coach was the development of the athlete. The development of the athlete can be achieved across several dimensions. One of these dimensions was organisation; this component involved applying knowledge to establish optimal conditions for training and competition. The players appear to need to feel secure with off the field issues, so they can be left to get on with on the field training. Woodman and Hardy (2001) identified finances as a source of stress for elite athletes. More specifically stress appeared to be caused by 'the perception of money being used to control the athlete.' The pension situation with several of the players may have been perceived as a source of stress. There will always be some players who will complain, as in any walk of life. If robust systems are put into place then even these players can be dealt with. They may not be happy with the outcome but there is an outcome and so the player has closure on that issue and the club has fulfilled its duty.

Limitations.

Following the completion of the second study the coaching staff at the rugby union club where the researcher was involved were changed. Arrangements with the previous coaching staff had been made for them to be the intervention group for the final study. A control group had also been organised. The new coaches appeared open to the idea of psychological support and several discussions ensued over a period of four months. During this period the researcher became increasingly concerned with the time issue. After this period, the new coach decided he did not want any research to take place in the club at that moment in time. Fortunately, at the same time a colleague of the researcher was approached by the physiotherapist of another professional rugby league club to help with some fitness testing. On the back of this, the researcher was able to complete the intervention study but in rugby league. The researcher felt it necessary to get a control group in the same sport. Whilst the researcher was attempting to find a control group, the rugby league coach from the intervention club put the researcher in contact with another professional rugby league team. The potential control group team had entered negotiation with another institution for scientific support. The researcher approached the sport psychologist involved in the negotiation and asked if he would allow the research to take place. The researcher was told no because the consultant did not 'believe in' using questionnaires. Fortunately, the researcher's colleague had a contact in another professional team who were happy to act as a control group. The process of finding both an intervention group and a control group was very difficult and took six months in total.

The very nature of professional team sport appears to make them driven by short term goals e.g. winning. Coaches are very quickly moved on and replaced, so the development of a relationship between a researcher with a coach is difficult. Trust between the coach and researcher needs to exist so each is confident in what the other has to offer. Harwood (2008) developed a relationship with a professional football club over two years before instigating an intervention programme with the club's youth and academy players. Pain and Harwood (2004) reported a lack of coach knowledge, time, and awareness as internal barriers to the successful implementation of sport psychology interventions within football clubs. Trust is developed over time. The time wasted soliciting a control group could have been far better spent developing a relationship with the coaches and the players in the intervention group. Having gone through the process, however, it is the nature of applied research that things frequently do not go exactly according to plan. For this researcher, ecological validity has high value which makes the time consuming process of getting professional clubs involved worthwhile.

The research was carried out with only a small group of players in the intervention group and a small number in the control group. The small sample size means that results would need to be treated cautiously as the power of the results is low. A random sample of the population of professional rugby league players may have led to a reduction in the bias found in the results here because the contextual circumstances affecting each player in either group would not have been the same.

Typically, a randomised control trial tries to minimise the likelihood of confounding variables particularly unknown confounding variables. In this intervention there were several. Reality, however, is that without the co-operation of the rugby league, the head coaches and the selected players at each of the clubs it would be very unlikely that any results would have been produced. To organise and meet with that many people would have taken even longer to solve than the problems encountered by the researcher. The nature of the intervention study would have rendered the design of the study difficult to complete. The nature of the intervention was to discuss issues with players on a daily basis. If the researcher needed to travel as far south as London, or as far north as Leeds, due to the random sampling process, the time constraints of conducting the study would have been extremely difficult to manage. The nature of the intervention did not follow a strict protocol, so issues were raised by players in various training venues at various times and they were discussed either with the individuals or in small groups. Development of rapport was necessary for the players to approach the researcher. Random sampling of the population would have meant much less time spent with the players. By selecting a single cohort of players the researcher had much more access to that group in order to complete the intervention. The development of rapport with the players was much easier to establish when using a single group.

The same issues apply to the control group as applied to the intervention group. Random sampling of the control group may have helped control for confounding variables but this would need to be balanced against the possibility of contamination across the intervention group and the control group where players were at the same club. The arduous nature of trying to collect the data because of the geography of the teams would also make this prohibitive for a single researcher.

Each of the seven training behaviours selected needed to have a clear definition which made it independent from the other training behaviours. For several of the variables, definitions are clear and well-established, e.g. dependability which is synonymous with conscientiousness as has been defined by Costa and McCrae (1992). Others, however, are

less well-established, e.g. ability to be coached, which was made up of the sub-constructs of understanding, readiness, and openness. Promotion of openness may also be part of the coping with the training environment construct as suggested previously. Social skills appear as a group of skills where the importance and power may change according to the circumstance. These skills less clearly defined and seem to have a moderating effect on the effectiveness of coping according to Segrin et al. (2007).

Questionnaires by their nature come with limitations e.g. social desirability, i.e. people respond to items as a result of their social acceptability rather than their true feelings; or consistency motif, i.e. people try to respond consistently over a period of time irrespective of their true feelings; or mood state, i.e. people may view the world around them in a generally positive, or generally negative way. These are examples of variables which may have affected this study, for a fuller list see Podsakoff et al. (2003).

The list of training behaviours considered is also not exhaustive; e.g. Woodman et al. (2010) considered coping with adversity, quality of preparation, and concentration in their study on personality and training behaviours with British gymnasts. Oliver (in press) identified professionalism, motivation, coping ability, commitment and effort, seeking improvement, concentration, and negative behaviours, during interviews with elite coaches from three team sports (rugby union, soccer, and rugby league). The behaviours which were not measured may be a further confounding variable.

Future directions.

There is a strong case for this study to be repeated using a team which did not have so many issues. Equally, a study involving a modified random block sampling procedure, where small groups of volunteer players were used from different clubs and compared against non-volunteer players from the same clubs may be an alternative. There would also be a case for a study in rugby union and rugby league with comparisons being drawn between the codes. Other intervention studies may be useful in other interactive team sports e.g. hockey or football. In these studies an intervention may placed in other variables the players or the coaches found discriminatory e.g. for the players: Quality of preparation, intensity of effort, coping with the training environment and dependability, and the coaches intensity of effort and dependability. Other more coactive training groups may be useful to study, e.g. a group of runners who train together or tri-athletes. The establishment of important training behaviours across different sports would also be a useful development. The opportunity for a researcher to be placed with a club fulltime may also enhance the

development of rapport with both the players and the coaches. The opportunity to work with a team on a full time basis, however, may cause the reduction of objectivity.

General Discussion

Summary

The purpose of this research programme was to try and identify and improve psychological characteristics that were associated with success in professional rugby players. Three studies were undertaken. The purpose of Study 1 was to try and make explicit the psychological characteristics coaches implicitly recognised in potential future professional rugby players. Specifically, seven professional rugby coaches were interviewed using unstructured interviews to elicit common psychological characteristics coaches deemed important. A grounded theory approach (Strauss and Corbin 1998) was employed to allow the theory to emerge from the data. All the interviews were transcribed verbatim; open coding was conducted to establish emergent themes. Axial coding followed to create common themes between the coaches. Member checking, parallel coding, and a focus group were all employed to improve the validity of the interpretation of the coaches' data. The results revealed seven important training behaviours, as seen by the coaches (dependability, intensity of effort, coping with the training environment, distractibility, ability to be coached, social skills, and quality of preparation).

Study 2 developed a series of items representing each of the seven training behaviours the coaches had identified as important in study 1. Once the items had been established two questionnaires were designed, the Training Related Variables Questionnaire (TRVQ) and the Training Related Variables-Coaches Questionnaire (TRV-CQ). The questionnaires were distributed to 308 rugby players, and the coaches of those players. 151 professional players and 157 amateur players were sampled. Confirmatory factor analyses were carried out on the two questionnaires and the items were reduced from 42 to 27 in the TRVQ and from 42 to 21 in the TRV-CQ. Once the factorial validity of the two questionnaires was adequately established, discriminant function analyses were performed on the players and the coaches' data. Results revealed coaches identified ability to be coached, social skills, intensity of effort, and dependability as discriminating between professional and amateur players. Players, however, identified quality of preparation, intensity of effort, coping with the training environment, and dependability as discriminating between professional and amateur players. From these results there seemed to be a lack of understanding on the part of the players and the coaches as to the others perspective of which training behaviours are important.

The aim of study 3 was to design and implement an intervention based on the construct of ability to be coached. This construct was selected as it was the most powerful discriminatory factor identified by the coaches in study 2. It was also thought that it was the coaches who selected the side so it would be more applicable for the players to understand the coaches' perspective in terms of important training behaviours. A professional rugby team was selected to act as the intervention group and a second professional team selected to act as the control group. Each of the players in the intervention group and the control group completed the TRVQ, three times over a 12 week period; week 0 week 6, and week 12. At the same time the coaches completed the TRV-CQ on the players at the same time points. In this study week 0 to week 6 were in preseason and weeks 6 to week 12 were in the season proper. The twelve weeks ran consecutively. Prior to the intervention beginning, baseline data were collected from the players and coaches of the intervention and the control groups (week 0). The intervention began with an educational session where the players in the intervention group were facilitated to identify behaviours associated with the sub-constructs of ability to be coached; readiness, openness, and understanding. From this point the players were told that the researcher would meet with them on an informal ad hoc basis, before, during, or after training to discuss applying the three sub-constructs to their training. There was approximately an 80% take up by the players, who engaged as individuals or in small groups. At week 6, a second measurement was taken from the players and coaches of the intervention and the control groups. The ability to be coached construct was reinforced via a presentation and a social skills questionnaire was given to the players in the intervention group (essentially, because social skills correlated very highly with ability to be coached). During this six week period the researcher had no contact with the control group. Engagement with the players remained around the 80% for the second six week period. A final data collection was conducted with the players and coaches from the intervention group and the control group in week 12, six weeks into the season.

Two mixed model MANOVA's were conducted on the data collected from the players and the coaches. The players' data revealed a significant group x time interaction, but the univariate follow up ANOVAs failed to identify any significant differences. To try and identify the source of the significant interaction, independent t-tests were used to try and find differences between groups at each data collection point. The analysis of the coaches' data followed a more traditional line. A significant group x time interaction was obtained, and the univariate ANOVA follow ups revealed significant differences in coping with the training environment, quality of preparation, and distractibility. Bonferroni adjusted t-tests were then used to perform multiple comparison tests. The results from this study should be interpreted with caution. Improvement of ability to be coached was the primary aim of this study but neither the players nor the coaches of the intervention group detected a significant difference

in that construct over the 12 week period. This lack of a significant difference may be due to control of the study rather than the failure of the intervention. Several confounding variables plagued the study; these confounding variables were beyond the control of the researcher, the most significant of them being that the club concerned went bankrupt. Taking that into account there are several ways the design of the study may have been improved. A randomised single subject or small group design across several clubs may have minimised the impact of such confounding variables. Participant observation across two clubs may have alerted the researcher to the confounding variables earlier.

Conclusions, Limitations and Future Directions

The research programme made an attempt to increase the number of factors which rugby coaches or their governing bodies may consider in a talent development programme from three to four. Traditionally anthropometric, physiological, and personality measures have been used with limited success (Reilly and Williams 2000; Abbott and Collins 2004). As a result of this research programme a fourth factor, training behaviours may be used. In the first study, interviewing seven coaches who worked with 'talented' athletes in professional rugby union seemed a logical place to start. A weakness of the first study was that the coaches who were interviewed came from only two clubs. If a broader number of clubs had been selected then other training behaviours may have emerged. Training behaviours might also be common across sports so it may have been useful to adopt a more generic approach to begin with and interview coaches across several sports. The middle ground may have been to select similar groups of sports e.g. invasion games or net games. However, the practicality of getting in contact with a group of coaches all coaching at a similar level may have proved difficult. Developing rapport with the coaches may have been difficult as the researcher's experience of playing and coaching was in rugby. This experience allowed the researcher to speak the language of rugby; a similar understanding of a number of different sports would have taken considerable time to develop. The nature of the unstructured interviews could be seen as a strength because the researcher began the process without clearly defined research questions, this allowed the coaches not to be confined by the preconceived ideas of the researcher. However, the very nature of this type of research probably means that the only interview which was truly unstructured was the very first one. Even though a deliberate effort was made by the researcher not to impose ideas from previous interviews on the next interview it may well have happened sub-consciously. The fact that it is recognised here may in itself suggest ideas were transferred from one interview to the next. Seven trained interviewers could have conducted a single interview each. However, this brings its own problems with it, namely, seven sets of possible biases rather

than the one set from a single researcher. Whether this study used a truly grounded theory approach is also open for debate. 'Theoretical saturation' may or may not have taken place. Again this question will no doubt be answered over time as more training behaviours are uncovered in rugby and in other sports. In this case, as Strauss and Corbin (1998) acknowledge the researcher needs to act 'within the limits of available time and money'. Having said all this, seven training behaviours were unearthed (dependability, intensity of effort, coping with the training environment, distractibility, ability to be coached, social skills, and quality of preparation).

One question that future research may consider is differences in the most important training behaviours across different sports or different types of sports. Alongside this, future research may consider the most important training behaviours across age groups and if important training behaviours change as athletes progress through the stages of the elite development model proposed by Cote and Hay (2002). During the analysis phase of the first study several of the initial categories were discarded e.g. family. Further exploration of the role the family plays in the development of talented athletes is warranted.

Independence was discarded by the researcher in the second round of coding. However, the area of independence is a future direction for research which may have some potential. Should talented athletes be encouraged to develop interests outside of their sport? Academy players are with the coaches for a maximum of five hours per day which leaves 19 hours away from supervision. Nutritional, sleep, and rest advice appears to be given by most professional clubs but adherence to this advice may be an interesting line to investigate.

In the second study, the design of the Training Related Variables Questionnaire (TRVQ) and the Training Related Variables-Coaches Questionnaire (TRV-CQ) from the seven categories (dependability, intensity of effort, coping with the training environment, distractibility, ability to be coached, social skills, and quality of preparation) took place. The resultant data collected was analysed using confirmatory factor analysis (CFA) in a somewhat exploratory way. As a result of the CFA the TRVQ was reduced from 42 to 27 items and the TRV-CQ was reduced from 42 to 21 items. Internal reliability was also examined by Cronbach's alpha with varying degrees of success. Further development of the TRVQ would be of use to make it into a psychometrically validated instrument. This would require the development of some new items and confirmation of the factor structure and internal reliability. Discriminant function analyses were performed on both sets of data, from the players and the coaches. The results seemed to expose that professional rugby players perceive different training behaviours to determine success to the training behaviours perceived by coaches. Further research should try to understand how these different perceptions develop, what the consequences of them are, and whether they disappear in some circumstances. It could

also consider if an intervention could be designed that removes differences between coaches and players ratings of the most important training related variables.

In the third study the researcher was exposed to the short term nature of professional sport. This study provided professional rugby players with an intervention to improve the most powerful discriminatory training behaviour from the coaches' perspective. As the intervention was being planned the researcher's contacts at the primary professional rugby club left along with several of the coaching staff. The researcher then approached the new coach to ask if the intervention could be continued with the club as planned. After several meeting, over several months, the researcher was refused access to the players. The researcher is not sure what to conclude from this experience. Applied research can be a very fragile process; however the researcher would still advocate as much ecological validity as possible in studies as the very nature of sport psychology is an applied science. Further issues continued to upset this study many of which remained beyond the control of the researcher. With hindsight there were several ways in which the study might have proceeded more successfully. These have been mentioned in the limitations section of that study. This study required a large and sustained effort on the part of the researcher and it is a disappointment that the study is unlikely ever to be published.

To develop talent is a long term process and this seems to clash with the short term goals of the private owners of professional rugby teams. There is a balance to be found between the development of talent and the necessity to stay in the top division of that sport. The balance between the issues of long term development and short term results is likely to be a problem with all achievement activities. In high level sport achievement activities have deadlines when achievement must be demonstrated.

Reflection

The PhD process has always been carried out with its application in mind. How can I help athletes and coaches improve what they do? During that time there have been many changes to me as a person, a consultant, a researcher, and a teacher. As a person I have become a father and hopefully a good role model for Sam and Matt. I have taken up running and found it a great place to listen to tutorials and think through ideas.

As a consultant, the PhD process has helped me become more analytical and given me a greater experience in working with athletes. It has improved my confidence and given me the opportunity to interact with many professional athletes, to try and understand where they are coming from and what they are trying to achieve. I have used skills which I did not know I had, e.g. selling my research ideas to professional rugby clubs and getting them to buy into

the ideas I was trying to understand. Being able to justify and defend my position to coaches so they understand what I am trying to achieve for them. Ironically, my best attempt at this resulted in failure.

As a researcher I have learned skills and techniques that I did not know existed. I have been exposed to both qualitative and quantitative research techniques. It is only by spending time with these things that you become familiar with them and so the apprehension subsides.   I have hopefully become more organised and learned the benefit of planning, still an area I need to do considerable work on. I look at everything with a different eye than seven years ago. I am much less likely to accept what people say, at face value, and much more likely to question myself. I am beginning to appreciate how little I actually know and how we have made only slight scratch on the surface of training behaviours. My writing skills have improved, although there is still room for a great deal of improvement. No more five line sentences and no more split infinitives, most of the time. Still only occasionally do I wander off onto a tangent when my writing should be focussed on the subject at hand. It has been difficult at times working in isolation, even though I know Lew is only at the end of the phone. I would advise anyone to try and get into a group of students who are all studying together. It may just be me.

As a teacher, I can only hope to pass on as much as possible to the students. I hope I can develop their curiosity to ask good questions, and their appreciation that good science and rigorous methodology is the best way to quench that curiosity and answer those questions. By doing this we can move the process forward centimetre by centimetre.

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<u>Appendices</u>

<u>Appendix 1</u>

<u>INFORMATION SHEET</u>

Coaches beliefs about desirable characteristics of potential professional rugby players

You are being invited to take part in a research study. Before you agree to take part it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. If you wish take time to discuss it with friends or relatives. Ask us if anything is not clear or if you would like more information. Take time to decide whether you wish to take part, or not. Consumers for Ethics in Research (CERES) provides information about research and questions you may have (www.ceres.org.uk)

I am interested in finding out what you look for in a player entering the academy system and the characteristics they should have in order to 'graduate' the system as a professional athlete. This will form part of a larger study which will consider how to try and develop these characteristics . The way the initial study, in which you are invited to participate, will be done is by a series of interviews. The first interview will be conducted individually. The information will be recorded using a tape recorder. Information that you give me will be transcribed and written down by me in a report. At a later date the information in this report will be discussed with you, to confirm the information is accurate. When I have repeated this process with a number of coaches I will collate the information from all participants. There will then be an open discussion with other coaches, within the club, on the themes which have emerged. The sources of the themes will remain anonymous throughout the discussions.

It is up to you to decide to take part. If you do decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are free to withdraw at any time without giving a reason. During the interviews you are free to refuse to answer any of the questions.

The study will involve you taking part in an initial interview which will last approximately one hour at a suitable venue. Several weeks later you will be asked, in a second meeting, to confirm that the information from the first interview is correct and sufficient (approx half an hour). Several weeks later again, the group of coaches will be brought together to discuss the themes which have emerged from the individual interviews. The source of the themes will remain anonymous.

The possible advantages of taking part in this study are, it may make you more aware of what you, and others, are looking for in academy players. The information gained may help you direct your efforts when developing academy players.

All information which is collected about you during the course of the research will be kept strictly confidential. Any information which leaves the School will have your name and address removed so that you cannot be recognised from it.   It will not be possible to identify you in any report or publication of this study. The audiotapes which are used in this study will be transcribed and the transcribed, validated information used to inform the focus group. The audiotapes will remain in the possession of the researcher until the study is completed. They will then be destroyed.

Please contact me if you have any question.

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Appendix 2

Please read each of the following statements carefully. There are no correct or incorrect answers. Simply circle the number that best corresponds to your own experiences. The result of the questionnaire will remain totally confidential and will be used for research purposes only.

1   I take responsibility, for my actions, when training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

2   I do what I say I am going to do in training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

3   I treat a training as seriously as a game

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

4   If we are doing something I don't enjoy I tend to ease up a bit (R)

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

5   At times my mind wanders to non rugby thoughts during training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

6   I always take onboard the coaches instructions and suggestions

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

7   I always try my hardest in training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

8   I ask questions when I am not sure what to do

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

9   I can usually understand what the coaches are trying to do

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

10 I complete my own cool down after each session

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

11 I complete my own warm up before the session

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

12 I consistently work hard in training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

13 I find it difficult to maintain concentration throughout a training session

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

14 I find it hard to concentrate when something is explained during training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

15 I get frustrated at my own performance in training

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

16 I have completely recovered from the last training session

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

17   I am always ready to be coached

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

18   I am at the training session before I need to be

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

19   I am easily distracted by others during a training session

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

20   I am easy to work with

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

21   I am open to new ideas

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

22   I let my concentration levels drop if I am performing something I know well in training. eg a drill

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

23   I like to get my own way (R)

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

24   I like to try new skills

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

25   I make an effort to engage with other members of the squad

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

26   I mentally rehearse match situations a lot in training

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

27   I never go and work on my skills in my own time, or at the end of the training session (R)

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

28   I only try really hard on the things I enjoy (R)

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

29   I put maximum effort in right up to the end of every session

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

30   I relate well to other people

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

31   I put maximum effort in right up to the end of every session

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

32   I tend to concentrate less during training sessions than during games

1	2	3	4	5	6	7	8	9
	Strongly Disagree			Not Sure			Strongly Agree	

33   I try to consider other peoples opinions

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

34   I use training situations to practice what I would do in a match

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

35   My reputation as a 'good trainer' is important to me

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

36   If I think the coach is making us work too hard I try to save some energy (R)

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

37   If the coach criticises me, in training I feel less confident in my ability ®

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

38   If the coach criticises me in training I work harder to do things correctly

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

39   If the coach criticises me in training I feel I have let myself down (R)

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

40   In every training session I try to improve my game

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

41   In training, the coaches can rely on me to get the job done

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

42   When the coach suggests I do something differently I feel he is undermining my play (R)

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

43   When the coach tells me to do something differently I usually think he is trying to help me

1	2	3	4	5	6	7	8	9
Strongly Disagree				**Not Sure**			**Strongly Agree**	

Appendix 3

Please read each of the following statements carefully. There are no correct or incorrect answers. Simply score the player from the scale below, by placing a number in the corresponding box. The result of the questionnaire will remain totally confidential

	1	2	3	4	5	6	7	8	9
		Strongly Disagree			Not Sure			Strongly Agree	

		Players names:																	
1	23	He takes responsibility, for his actions, when training																	
2	19	He does what he says he is going to do in training																	
3	25	He treats training as seriously as a game																	
4	3	If he is doing something he doesn't enjoy he tends to ease up a bit (R)																	
5	39	At times his mind wanders to non rugby thoughts during training																	
6	7	He always take onboard our instructions and suggestions																	
7	1	He always tries his hardest in training																	
8	13	He asks questions when he is not sure what to do																	
9	15	He can usually understand what we are trying to do																	
10	34	He completes his own cool down after each session																	
11	33	He completes his own warm up before the session																	
12	6	He consistently works hard in training																	
13	38	He finds it difficult to maintain concentration throughout a training session																	
14	41	He finds it hard to concentrate when something is explained during training																	
15	30	He gets frustrated at his own performance in training																	
16	24	He has completely recovered from the last training session																	
17	16	He is always ready to be coached																	
18	32	He is at the training session before he needs to be																	
19	40	He is easily distracted by others during a training session																	
20	26	He is easy to work with																	
21	14	He is open to new ideas																	

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			1 Strongly Disagree	2	3	4	5 Not Sure	6	7	8 Strongly Agree	9
		Players names:									
22	43	He lets his concentration levels drop if he is performing something he knows well in training. eg a drill									
23	28	He likes to get his own way (R)									
24	17	He likes to try new skills									
25	27	He makes an effort to engage with other members of the squad									
26	37	He mentally rehearses match situations a lot in training									
27	35	He never goes and works on his skills in his own time, or at the end of the training session (R)									
28	5	He only tries really hard on the things he enjoys (R)									
29	2	He puts maximum effort in right up to the end of every session									
30	31	He relates well to other people									
31	21	He takes responsibility when training with others									
32	42	He tends to concentrate less during training sessions than during games									
33	29	He tries to consider other peoples opinions									
34	36	he uses training situations to practice what he would do in a match									
35	22	His reputation as a 'good trainer' is important to him									
36	4	If he thinks we are making him work too hard he tries to save some energy (R)									
37	12	If we criticise him he feels less confident in his ability (R)									
38	9	If we criticise him in training he works harder to do things correctly									
39	11	If we criticises him in training he feels he has let himself down (R)									
40	18	In every training session he tries to improve his game									
41	20	In training,we can rely on him to get the job done									
42	44	When we tell him to do something differently he usually think we is trying to help him									
43	10	When we suggest he does something differently he feels we are undermining his play (R)									
44	8	When we tell him to do something differently he usually thinks we are trying to help him									

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Appendix 4

Improving players training behaviours

Training behaviours
- Behaviours
- Dependability
- Coping with the training environment
- Quality of preparation
- Distractability
- Ability to be Coached
- Social Skill
- Intensity of effort

Ability to be coached.
- The coaches identified 'ability to be coached' as the most important training behaviour.
- Players identified 'quality of preparation' as the most important variable.
- ABC Made up of
- Readiness
- Openness
- Understanding

Three areas to look at
- Readiness : completely prepared or in fit condition for immediate action.
- How would the coach know you are ready to train? Before training, during training
- What does it look like when you are **not** ready to train?

Openness
- Open to new ideas
- Open to change
- How do you demonstrate openness within training?
- What does it look like when you are **not** open in training?

Understanding
- Knowledge of or familiarity with a particular thing; skill in dealing with or handling something.
- How does the coach know you understand?
- Who picks things up quickly, what do they do?

1

Appendix 5

Attention to detail

Are the first five minutes the most important?

Areas to work on

18 players asked – The worst skill identified:

- I try to consider other peoples opinion
- I am easy to work with
- In every training session I try to improve my game

I try to consider other peoples opinion

Who's opinions do you need to consider?

- Approx 35% of players not completed all data over the last two weeks.
- How many times in the last two weeks have you been asked for RPE's.
- Sleep system has changed? How many of you keep a record even though you do not need to? (Developing good habits)

- Remember your times for massage/ treatment
- How many people rang up to check their times ?
- If you cannot remember the time for treatment how do you remember the right place to be on the field?
- Do you still have your individual pre-season reports?
- How many of you work on the points from the report?
- How many days per week should Ben be available?
- How often do you do your re-hab/ pre-hab

1

Fines

- 2011 - £300 paid !

  £200 still owed !

- When was the last time we scored first in a match?

- When was the last time we scored first in the second half of a match?

- Why are skills poor at the start of a session, and good by the end of the session?

- You have rated yourself as a top six team

- Are you fulfilling that rating?

Col

Is this about **Quality of training** not Quantity of training?

- These are all training behaviours, how can we get all these issues down to zero?
- It is the attention to detail on a day to day basis that gives you practice for attention to detail on match day.
- You cannot switch it on and off.

Are the first five minutes the most important?

Where do we go from here ?

- Go for a week without getting any fines
- Go for a week without Daf chasing anyone for information.
- Make the first five minutes of every session you do the most important.
- Think about the session before you arrive.
- Switch on mentally as well as physically.
- Come and talk to me, I can help with skills and techniques to help

Appendix 6

			Multivariate Tests[b]				
Effect			Value	F	Hypothesis df	Error df	Sig.
Between Subjects	Intercept	Pillai's Trace	.997	1293.747[a]	7.000	29.000	.000
		Wilks' Lambda	.003	1293.747[a]	7.000	29.000	.000
		Hotelling's Trace	312.284	1293.747[a]	7.000	29.000	.000
		Roy's Largest Root	312.284	1293.747[a]	7.000	29.000	.000
	Group	Pillai's Trace	.306	1.825[a]	7.000	29.000	.120
		Wilks' Lambda	.694	1.825[a]	7.000	29.000	.120
		Hotelling's Trace	.441	1.825[a]	7.000	29.000	.120
		Roy's Largest Root	.441	1.825[a]	7.000	29.000	.120
Within Subjects	Time	Pillai's Trace	.527	1.748[a]	14.000	22.000	.117
		Wilks' Lambda	.473	1.748[a]	14.000	22.000	.117
		Hotelling's Trace	1.112	1.748[a]	14.000	22.000	.117
		Roy's Largest Root	1.112	1.748[a]	14.000	22.000	.117
	Time * Group	Pillai's Trace	.661	3.071[a]	14.000	22.000	.009
		Wilks' Lambda	.339	3.071[a]	14.000	22.000	.009
		Hotelling's Trace	1.954	3.071[a]	14.000	22.000	.009
		Roy's Largest Root	1.954	3.071[a]	14.000	22.000	.009

a. Exact statistic
b. Design: Intercept + Group
Within Subjects Design: Time

Appendix 7

Tests of Between-Subjects Effects

Transformed Variable:Average

Source	Measure	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	DEP	6317.881	1	6317.881	4326.542	.000
	COP	5675.425	1	5675.425	5225.116	.000
	QUAL	3377.307	1	3377.307	3990.804	.000
	DIST	4041.565	1	4041.565	736.549	.000
	ABC	6670.741	1	6670.741	4715.267	.000
	SOC	6932.020	1	6932.020	6684.082	.000
	INT	6730.785	1	6730.785	3776.995	.000
Group	DEP	4.381	1	4.381	3.000	.092
	COP	4.558	1	4.558	4.196	.048
	QUAL	.343	1	.343	.405	.528
	DIST	.768	1	.768	.140	.711
	ABC	2.437	1	2.437	1.722	.198
	SOC	9.083	1	9.083	8.759	.005
	INT	2.009	1	2.009	1.127	.296
Error	DEP	51.109	35	1.460		
	COP	38.016	35	1.086		
	QUAL	29.620	35	.846		
	DIST	192.051	35	5.487		
	ABC	49.515	35	1.415		
	SOC	36.298	35	1.037		
	INT	62.372	35	1.782		

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Appendix 8

Univariate Tests

Source	Measure		Type III Sum of Squares	df	Mean Square	F	Sig.
Time	DEP	Sphericity Assumed	1.077	2	.538	1.542	.221
		Greenhouse-Geisser	1.077	1.338	.805	1.542	.225
		Huynh-Feldt	1.077	1.411	.763	1.542	.225
		Lower-bound	1.077	1.000	1.077	1.542	.223
	COP	Sphericity Assumed	1.733	2	.866	3.041	.054
		Greenhouse-Geisser	1.733	1.657	1.046	3.041	.065
		Huynh-Feldt	1.733	1.779	.974	3.041	.061
		Lower-bound	1.733	1.000	1.733	3.041	.090
	QUAL	Sphericity Assumed	.567	2	.283	.553	.578
		Greenhouse-Geisser	.567	1.947	.291	.553	.573
		Huynh-Feldt	.567	2.000	.283	.553	.578
		Lower-bound	.567	1.000	.567	.553	.462
	DIST	Sphericity Assumed	1.288	2	.644	.565	.571
		Greenhouse-Geisser	1.288	1.921	.671	.565	.564
		Huynh-Feldt	1.288	2.000	.644	.565	.571
		Lower-bound	1.288	1.000	1.288	.565	.457
	ABC	Sphericity Assumed	.408	2	.204	.531	.590
		Greenhouse-Geisser	.408	1.306	.312	.531	.517
		Huynh-Feldt	.408	1.375	.296	.531	.525

	Lower-bound	.408	1.000	.408	.531	.471
SOC	Sphericity Assumed	2.075	2	1.037	3.055	.053
	Greenhouse-Geisser	2.075	1.408	1.474	3.055	.073
	Huynh-Feldt	2.075	1.491	1.391	3.055	.070
	Lower-bound	2.075	1.000	2.075	3.055	.089
INT	Sphericity Assumed	1.321	2	.661	1.097	.339
	Greenhouse-Geisser	1.321	1.478	.894	1.097	.325
	Huynh-Feldt	1.321	1.572	.841	1.097	.328
	Lower-bound	1.321	1.000	1.321	1.097	.302

Appendix 9

Univariate Tests

				df		F	Sig.
Time * Group	DEP	Sphericity Assumed	.467	2	.234	.669	.515
		Greenhouse-Geisser	.467	1.338	.349	.669	.459
		Huynh-Feldt	.467	1.411	.331	.669	.467
		Lower-bound	.467	1.000	.467	.669	.419
	COP	Sphericity Assumed	1.512	2	.756	2.654	.077
		Greenhouse-Geisser	1.512	1.657	.912	2.654	.088
		Huynh-Feldt	1.512	1.779	.850	2.654	.084
		Lower-bound	1.512	1.000	1.512	2.654	.112
	QUAL	Sphericity Assumed	2.492	2	1.246	2.430	.095
		Greenhouse-Geisser	2.492	1.947	1.280	2.430	.097
		Huynh-Feldt	2.492	2.000	1.246	2.430	.095
		Lower-bound	2.492	1.000	2.492	2.430	.128
	DIST	Sphericity Assumed	2.322	2	1.161	1.019	.366
		Greenhouse-Geisser	2.322	1.921	1.209	1.019	.364
		Huynh-Feldt	2.322	2.000	1.161	1.019	.366
		Lower-bound	2.322	1.000	2.322	1.019	.320
	ABC	Sphericity Assumed	.597	2	.298	.777	.464
		Greenhouse-Geisser	.597	1.306	.457	.777	.415
		Huynh-Feldt	.597	1.375	.434	.777	.421
		Lower-bound	.597	1.000	.597	.777	.384
	SOC	Sphericity Assumed	.370	2	.185	.545	.582
		Greenhouse-Geisser	.370	1.408	.263	.545	.523
		Huynh-Feldt	.370	1.491	.248	.545	.532
		Lower-bound	.370	1.000	.370	.545	.465
	INT	Sphericity Assumed	1.413	2	.707	1.174	.315
		Greenhouse-Geisser	1.413	1.478	.956	1.174	.305
		Huynh-Feldt	1.413	1.572	.899	1.174	.307
		Lower-bound	1.413	1.000	1.413	1.174	.286

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
										95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ADEP	Equal variances assumed	.511	.479	-.728	42	.470	-.15000	.20593	-.56558	.26558
	Equal variances not assumed			-.730	40.815	.470	-.15000	.20561	-.56530	.26530
BDEP	Equal variances assumed	5.227	.028	1.180	39	.245	.67416	.57125	-.48129	1.82962
	Equal variances not assumed			1.107	20.429	.281	.67416	.60923	-.59495	1.94328
CDEP	Equal variances assumed	1.314	.259	-1.792	38	.081	-.89463	.49931	-1.90544	.11618
	Equal variances not assumed			-1.985	32.326	.056	-.89463	.45071	-1.81234	.02308
ACOP	Equal variances assumed	1.440	.237	-.832	42	.410	-.14167	.17021	-.48516	.20183
	Equal variances not assumed			-.815	35.979	.421	-.14167	.17385	-.49427	.21093
BCOP	Equal variances assumed	4.521	.040	.929	39	.359	.50897	.54787	-.59920	1.61714
	Equal variances not assumed			.871	20.537	.394	.50897	.58403	-.70726	1.72520
CCOP	Equal variances assumed	.123	.728	-2.543	37	.015	-.72326	.28444	-1.29960	-.14692
	Equal variances not assumed			-2.658	36.751	.012	-.72326	.27215	-1.27482	-.17170
AQUAL	Equal variances assumed	10.352	.002	.359	42	.722	.09917	.27643	-.45869	.65703
	Equal variances not assumed			.379	35.049	.707	.09917	.26142	-.43152	.62985
BQUAL	Equal variances assumed	1.303	.261	2.064	37	.046	.60606	.29360	.01117	1.20095
	Equal variances not assumed			2.190	35.499	.035	.60606	.27680	.04441	1.16771
CQUAL	Equal variances assumed	.120	.731	-.934	37	.357	-.24599	.26349	-.77986	.28788
	Equal variances not assumed			-.912	31.001	.369	-.24599	.26979	-.79623	.30425
ADIST	Equal variances assumed	.904	.347	.037	42	.970	.01667	.44797	-.88737	.92070
	Equal variances not assumed			.038	41.842	.970	.01667	.44281	-.87705	.91039
BDIST	Equal variances assumed	.248	.622	.066	37	.948	.03543	.53571	-1.05002	1.12088
	Equal variances not assumed			.067	36.463	.947	.03543	.52573	-1.03034	1.10119
CDIST	Equal variances assumed	2.202	.146	.659	37	.514	.35762	.54271	-.74202	1.45726

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
	Equal variances not assumed			.631	27.808	.533	.35762	.56644	-.80303	1.51827
AABC	Equal variances assumed	.041	.841	-.324	42	.748	-.07083	.21859	-.51197	.37030
	Equal variances not assumed			-.322	39.594	.749	-.07083	.21982	-.51524	.37357
BABC	Equal variances assumed	2.845	.100	-1.101	38	.278	-.51343	.46639	-1.45758	.43072
	Equal variances not assumed			-1.242	28.795	.224	-.51343	.41339	-1.35917	.33231
CABC	Equal variances assumed	.973	.330	-1.516	37	.138	-.52406	.34579	-1.22471	.17658
	Equal variances not assumed			-1.622	34.237	.114	-.52406	.32304	-1.18038	.13226
ASOC	Equal variances assumed	.288	.594	-1.432	42	.160	-.31875	.22258	-.76793	.13043
	Equal variances not assumed			-1.423	39.454	.163	-.31875	.22398	-.77163	.13413
BSOC	Equal variances assumed	1.010	.321	-1.802	38	.080	-.82353	.45705	-1.74879	.10173
	Equal variances not assumed			-2.029	29.197	.052	-.82353	.40593	-1.65350	.00644
CSOC	Equal variances assumed	2.442	.127	-2.243	37	.031	-.73663	.32842	-1.40207	-.07119
	Equal variances not assumed			-2.404	34.044	.022	-.73663	.30643	-1.35934	-.11392
AINT	Equal variances assumed	1.494	.228	-1.188	42	.241	-.32778	.27590	-.88456	.22900
	Equal variances not assumed			-1.140	30.483	.263	-.32778	.28763	-.91480	.25924
BINT	Equal variances assumed	.353	.556	-.533	38	.597	-.24979	.46873	-1.19868	.69910
	Equal variances not assumed			-.589	32.673	.560	-.24979	.42392	-1.11259	.61301
CINT	Equal variances assumed	.794	.379	-.950	37	.348	-.37790	.39789	-1.18410	.42831
	Equal variances not assumed			-1.016	34.373	.317	-.37790	.37203	-1.13366	.37787

Appendix 11

Multivariate Tests[b]			Value	F	Hypothesis df	Error df	Sig.
Effect							
Between Subjects	Intercept	Pillai's Trace	.998	1669.962[a]	7.000	26.000	.000
		Wilks' Lambda	.002	1669.962[a]	7.000	26.000	.000
		Hotelling's Trace	449.605	1669.962[a]	7.000	26.000	.000
		Roy's Largest Root	449.605	1669.962[a]	7.000	26.000	.000
	Group	Pillai's Trace	.614	5.902[a]	7.000	26.000	.000
		Wilks' Lambda	.386	5.902[a]	7.000	26.000	.000
		Hotelling's Trace	1.589	5.902[a]	7.000	26.000	.000
		Roy's Largest Root	1.589	5.902[a]	7.000	26.000	.000
Within Subjects	time	Pillai's Trace	.585	1.912[a]	14.000	19.000	.094
		Wilks' Lambda	.415	1.912[a]	14.000	19.000	.094
		Hotelling's Trace	1.409	1.912[a]	14.000	19.000	.094
		Roy's Largest Root	1.409	1.912[a]	14.000	19.000	.094
	time * Group	Pillai's Trace	.704	3.226[a]	14.000	19.000	.010
		Wilks' Lambda	.296	3.226[a]	14.000	19.000	.010
		Hotelling's Trace	2.377	3.226[a]	14.000	19.000	.010
		Roy's Largest Root	2.377	3.226[a]	14.000	19.000	.010

a. Exact statistic
b. Design: Intercept + Group
Within Subjects Design: time

Appendix 12

Tests of Between-Subjects Effects

Transformed Variable:Average

Source	Measure	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	DEP	5020.829	1	5020.829	1643.975	.000
	COP	5230.280	1	5230.280	2342.793	.000
	QUAL	3573.929	1	3573.929	2154.044	.000
	DIST	3653.622	1	3653.622	594.370	.000
	ABC	5137.541	1	5137.541	1691.100	.000
	SOC	2656.696	1	2656.696	1782.463	.000
	INT	5094.793	1	5094.793	1650.740	.000
Group	DEP	.524	1	.524	.172	.681
	COP	19.760	1	19.760	8.851	.006
	QUAL	.019	1	.019	.012	.915
	DIST	1.831	1	1.831	.298	.589
	ABC	1.892	1	1.892	.623	.436
	SOC	5.484	1	5.484	3.679	.064
	INT	7.520	1	7.520	2.437	.128
Error	DEP	97.730	32	3.054		
	COP	71.440	32	2.232		
	QUAL	53.094	32	1.659		
	DIST	196.706	32	6.147		
	ABC	97.216	32	3.038		
	SOC	47.695	32	1.490		
	INT	98.764	32	3.086		

Appendix 13

Univariate Tests

Source	Measure		Type III Sum of Squares	df	Mean Square	F	Sig.
time	DEP	Sphericity Assumed	.870	2	.435	1.163	.319
		Greenhouse-Geisser	.870	1.530	.569	1.163	.310
		Huynh-Feldt	.870	1.641	.530	1.163	.312
		Lower-bound	.870	1.000	.870	1.163	.289
	COP	Sphericity Assumed	1.725	2	.863	1.549	.220
		Greenhouse-Geisser	1.725	1.815	.950	1.549	.222
		Huynh-Feldt	1.725	1.978	.872	1.549	.221
		Lower-bound	1.725	1.000	1.725	1.549	.222
	QUAL	Sphericity Assumed	.993	2	.497	1.446	.243
		Greenhouse-Geisser	.993	1.434	.692	1.446	.244
		Huynh-Feldt	.993	1.530	.649	1.446	.244
		Lower-bound	.993	1.000	.993	1.446	.238
	DIST	Sphericity Assumed	5.136	2	2.568	2.550	.086
		Greenhouse-Geisser	5.136	1.957	2.624	2.550	.087
		Huynh-Feldt	5.136	2.000	2.568	2.550	.086
		Lower-bound	5.136	1.000	5.136	2.550	.120
	ABC	Sphericity Assumed	9.052	2	4.526	6.628	.002
		Greenhouse-Geisser	9.052	1.983	4.566	6.628	.002
		Huynh-Feldt	9.052	2.000	4.526	6.628	.002
		Lower-bound	9.052	1.000	9.052	6.628	.015
	SOC	Sphericity Assumed	2.746	2	1.373	2.101	.131
		Greenhouse-Geisser	2.746	1.805	1.521	2.101	.136
		Huynh-Feldt	2.746	1.966	1.396	2.101	.132
		Lower-bound	2.746	1.000	2.746	2.101	.157
	INT	Sphericity Assumed	.234	2	.117	.221	.802
		Greenhouse-Geisser	.234	1.544	.152	.221	.745
		Huynh-Feldt	.234	1.658	.141	.221	.761
		Lower-bound	.234	1.000	.234	.221	.642

Appendix 14

Univariate Tests

Source	Measure		Type III Sum of Squares	df	Mean Square	F	Sig.
time * Group	DEP	Sphericity Assumed	1.023	2	.511	1.367	.262
		Greenhouse-Geisser	1.023	1.530	.669	1.367	.261
		Huynh-Feldt	1.023	1.641	.623	1.367	.261
		Lower-bound	1.023	1.000	1.023	1.367	.251
	COP	Sphericity Assumed	4.945	2	2.473	4.442	.016
		Greenhouse-Geisser	4.945	1.815	2.725	4.442	.019
		Huynh-Feldt	4.945	1.978	2.500	4.442	.016
		Lower-bound	4.945	1.000	4.945	4.442	.043
	QUAL	Sphericity Assumed	2.643	2	1.321	3.848	.026
		Greenhouse-Geisser	2.643	1.434	1.842	3.848	.042
		Huynh-Feldt	2.643	1.530	1.727	3.848	.038
		Lower-bound	2.643	1.000	2.643	3.848	.059
	DIST	Sphericity Assumed	12.027	2	6.014	5.971	.004
		Greenhouse-Geisser	12.027	1.957	6.144	5.971	.004
		Huynh-Feldt	12.027	2.000	6.014	5.971	.004
		Lower-bound	12.027	1.000	12.027	5.971	.020
	ABC	Sphericity Assumed	1.008	2	.504	.738	.482
		Greenhouse-Geisser	1.008	1.983	.509	.738	.481
		Huynh-Feldt	1.008	2.000	.504	.738	.482
		Lower-bound	1.008	1.000	1.008	.738	.397
	SOC	Sphericity Assumed	1.117	2	.559	.855	.430
		Greenhouse-Geisser	1.117	1.805	.619	.855	.421
		Huynh-Feldt	1.117	1.966	.568	.855	.429
		Lower-bound	1.117	1.000	1.117	.855	.362
	INT	Sphericity Assumed	1.047	2	.524	.986	.379
		Greenhouse-Geisser	1.047	1.544	.678	.986	.361
		Huynh-Feldt	1.047	1.658	.632	.986	.366
		Lower-bound	1.047	1.000	1.047	.986	.328

Appendix 15

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ADep	Equal variances assumed	.250	.620	1.490	41	.144	.56919	.38212	-.20252	1.34090
	Equal variances not assumed			1.486	31.427	.147	.56919	.38293	-.21138	1.34976
BDep	Equal variances assumed	.117	.735	.456	34	.651	.17162	.37651	-.59355	.93680
	Equal variances not assumed			.459	33.047	.649	.17162	.37392	-.58908	.93233
CDep	Equal variances assumed	2.920	.094	-.536	45	.594	-.19020	.35466	-.90452	.52411
	Equal variances not assumed			-.562	44.992	.577	-.19020	.33830	-.87158	.49117
ACop	Equal variances assumed	10.476	.002	-2.501	41	.016	-1.08016	.43185	-1.95230	-.20802
	Equal variances not assumed			-2.987	38.673	.005	-1.08016	.36158	-1.81173	-.34860
BCop	Equal variances assumed	.042	.839	-1.421	34	.164	-.43425	.30556	-1.05521	.18671
	Equal variances not assumed			-1.435	33.316	.161	-.43425	.30254	-1.04955	.18105
CCop	Equal variances assumed	.753	.390	-1.599	45	.117	-.46296	.28945	-1.04594	.12002
	Equal variances not assumed			-1.642	44.200	.108	-.46296	.28201	-1.03125	.10533
AQual	Equal variances assumed	6.790	.013	.372	41	.712	.13060	.35112	-.57849	.83969
	Equal variances not assumed			.430	40.762	.670	.13060	.30386	-.48317	.74437
BQual	Equal variances assumed	3.905	.056	1.075	34	.290	.31338	.29145	-.27892	.90567
	Equal variances not assumed			1.112	33.834	.274	.31338	.28188	-.25957	.88632
CQual	Equal variances assumed	2.701	.107	-.807	45	.424	-.28741	.35630	-1.00504	.43022
	Equal variances not assumed			-.859	44.297	.395	-.28741	.33465	-.96173	.38692
ADist	Equal variances assumed	.110	.742	.853	41	.399	.49972	.58616	-.68406	1.68351
	Equal variances not assumed			.888	35.679	.380	.49972	.56266	-.64176	1.64121
BDist	Equal variances assumed	.005	.944	2.558	34	.015	1.27388	.49809	.26164	2.28611
	Equal variances not assumed			2.566	32.685	.015	1.27388	.49639	.26359	2.28416
CDist	Equal variances assumed	1.250	.269	-.762	45	.450	-.35880	.47114	-1.30773	.59013

		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
	Equal variances not assumed			-.799	44.989	.429	-.35880	.44929	-1.26373	.54613
AABC	Equal variances assumed	1.412	.242	.519	41	.607	.21576	.41591	-.62419	1.05571
	Equal variances not assumed			.561	38.956	.578	.21576	.38448	-.56195	.99348
BABC	Equal variances assumed	.214	.646	-.302	34	.764	-.10112	.33451	-.78093	.57868
	Equal variances not assumed			-.305	33.204	.762	-.10112	.33164	-.77570	.57345
CABC	Equal variances assumed	3.031	.089	-.829	45	.412	-.30526	.36840	-1.04726	.43674
	Equal variances not assumed			-.896	42.552	.375	-.30526	.34079	-.99274	.38223
ASoc	Equal variances assumed	1.738	.195	-.424	41	.674	-.13928	.32845	-.80259	.52403
	Equal variances not assumed			-.469	40.350	.641	-.13928	.29671	-.73879	.46023
BSoc	Equal variances assumed	.041	.841	-.722	34	.475	-.21713	.30084	-.82851	.39426
	Equal variances not assumed			-.713	30.639	.481	-.21713	.30439	-.83823	.40398
CSoc	Equal variances assumed	2.164	.148	-1.118	45	.269	-.38161	.34121	-1.06883	.30561
	Equal variances not assumed			-1.181	44.822	.244	-.38161	.32325	-1.03274	.26952
AInt	Equal variances assumed	5.288	.027	.402	41	.690	.20456	.50879	-.82297	1.23209
	Equal variances not assumed			.452	40.875	.654	.20456	.45255	-.70947	1.11859
BInt	Equal variances assumed	.808	.375	1.911	34	.064	.77575	.40595	-.04924	1.60074
	Equal variances not assumed			1.935	33.526	.061	.77575	.40084	-.03929	1.59079
CInt	Equal variances assumed	1.044	.312	-.307	45	.761	-.12993	.42377	-.98344	.72359
	Equal variances not assumed			-.325	44.587	.747	-.12993	.39963	-.93504	.67518