CHAPTER 8

DISCUSSION OF RESULTS

"An expedition adventure racer does not look in awe at endurance record holders or listen in disbelief at tales of human struggle and survival. They reflect in quiet agreement and respectful appreciation for the sacrifices of their peers. They share in common a life driven by passion not possessions. For those in the arena, it is the experiences that provide value in living." **– Dan O'Shea**

8.1 INTRODUCTION

The aim of this chapter is to clearly present and systematically discuss the results of this study. The results will be discussed under the following headings or themes: description of the respondents, the perceived impact of environmental factors on performance, motivational strategies used during endurance events, coping strategies used during endurance events, attitude towards problems/challenges, and self-perception of endurance athletes. In the discussion, references will be made to other studies and theories to indicate how the findings of this study fits in with the larger body of sport psychology literature.

8.2 DESCRIPTION OF THE RESPONDENTS

Based on the population distribution factors of race, age, and gender the participants of this study generally reflect the general population of South Africa. Unfortunately no biographical statistics are available of the distribution of endurance athletes to determine whether this study reflects the endurance sport community of South Africa. When compared to the general population of South Africa certain limitations in the application of the results exist. The greater majority of respondents are male. The implication of this is that the results of this study are limited in its application to female endurance athletes. Unfortunately no Asian respondents were available.

No respondents in the age group 40 to 49 were available or willing to participate in the study. Therefore, results of this study might not be applicable to endurance athletes in this age category. However, if one takes into account one of the basic assumptions of the Salutogenic theory that sense of coherence is basically established by the age of 30 (see page 100) with relatively few changes thereafter,

the assumption can be made that coping and motivational strategies for the age group 40 to 49 would be similar to the groups 30 to 39 and 50+ and that with caution, the results can be generalised to this group. However, further research including this age group is essential.

The different disciplines that the respondents of this study participate in are relatively evenly distributed. It would seem that the more technical and "equipment intensive" (and consequently more expensive) the discipline becomes, the less popular the discipline. A possible explanation for this phenomenon might be that the majority of the respondents are from historically disadvantaged communities. The majority of the respondents participate in one endurance sport discipline. However, a significant number of the athletes participate in between two and four or more endurance sport disciplines. The athletes that participated in this study are relatively active in endurance sport and participated in over 200 endurance events during the previous year an average of 3.8 events per participant per year.

8.3 PERCEIVED IMPACT OF ENVIRONMENTAL FACTORS ON PERFORMANCE DURING ENDURANCE EVENTS

Environmental factors can either enhance or encumber performance, depending on the type of environmental factor or the perception of the environmental factor by the athlete. The impact can be on a physical level. It is possible that the environmental factors can have both positive and negative physical influences on performance. This finding is supported by countless other studies of which the following are examples; Warburton, Gledhill, and Quinney (2000) on blood volume, aerobic power and endurance performance, Bachle, Eckerson, Albertson, Ebersole, Goodwin and Petzel (2001) on the effect of fluid replacement on endurance performance, Hahn, Gore, Martin, Ashenden, Roberts and Logan (2001) on moderate training and living at sea level, Andrews, Sedlock, Flynn, Navalta and Ji (2003) on carbohydrate and supplementation in endurance-trained women athletes, González-Alonso, Teller, Andersen, Jensen, Hyldig, and Nielsen (1999) and Sawka and Pandolf (2003) on performance in hot climates. All of these studies (on different environmental factors) show how specific environmental factors influence on the physical performance during endurance events. In all of the studies environmental factors did have an impact on physical performance during endurance events.

Furthermore the results indicate that environmental factors impact on performance during endurance events on a mental level or a combination of both physical and mental. It is perceived that the environmental factors can have both positive and negative mental influences on performance. These results are fully supported by other research. Studies by Creagh *et al*., (1998) on female "off road" runners, Laursen and Rhodes (2001) on factors affecting performance in an ultra endurance triathlon, Ainslie *et al*., (2002) on energy balance, metabolism, hydration and performance during strenuous hill walking, Atkinson, Davidson, Jeukendrup and Passfield (2003) on cycling, Abbiss and Laursen (2005) on fatigue during prolonged endurance cycling, Kayser (2005) on endurance performance at high altitudes show that the environment has a significant impact on mental processes and consequently on performance.

Generally these studies indicate that the impact is situation and individual bound. In other words, each individual's perception as well as the situation determines whether the environmental factor is perceived positively or negatively. However, as seen in the studies by O'Neil (2004) and Abbiss and Laursen (2005) motivation, motivational and coping strategies have an influence on the individual's perception of environmental factors. Therefore, environmental factors should always be seen as an integrated part of endurance sport as a whole that has the potential to influence performance.

8.4 MOTIVATIONAL STRATEGIES USED DURING ENDURANCE EVENTS

In this section the focus was on the motivational strategies that are used by athletes during endurance events. Two factors, focus and source of incentive, were identified in chapter 5. These two factors determine the motivational strategies that will be used. From these two factors, four motivational strategies can be identified. These strategies are positive-internal, positive-external, negative-internal and negative-external. Athletes used all four of these strategies during endurance events to motivate themselves. The most commonly used strategy was positive-internal followed by negative-internal, positive-external and negative-external. It would seem as if endurance athletes are more motivated by internal incentives or rewards than by external incentives or rewards. This finding is supported by several research studies

conducted on the motivational attributions that justify an ultra-triathlete's need to perform (Anthony, 1996), competitive orientations and motives of adult sport and exercise participants (Beaudoin *et al*., 1996), achievement motivation, sports-related future orientation, and sporting career (Halvari & Thomassen, 1997), on adventure racing (Mann & Schaad, 2001), distance running (Williamson, 2003), the relationship between collegiate track runners' achievement orientations and perceptions of motivational climate (McManus, 2004), the influence of intrinsic motivation on an endurance (Tsigilis, 2005). According to these studies a mastery or task orientation as well as an emphasis on intrinsic motivation, as opposed to a win orientation and emphasis on extrinsic rewards, encourages participation and achievement.

The results indicate that the majority of athletes in this study focus on the positive outcomes of performing rather than on the negative outcomes to motivate themselves during endurance events. This finding is partially supported by the work of Atkinson (Gill, 2000; Potgieter, 2003) who stated that the motives to approach success and to avoid failure exist independently of each other and are present in all individuals' personality to some degree. One cannot be predicted on the basis of the other and are two separate achievement-related dimensions susceptible to external influences. However, a study by Halvari and Thomassen (1997) on achievement motivation, sports-related future orientation, and sporting career found that individual endurance athletes were more frequently motivated by the avoidance of failure than by the motive to approach success. There is therefore a difference between the results of this study and available literature. It must be remembered that studies on motivational orientations in sport are still limited (Conroy, Poczwardowski & Henschen, 2001) and it is to be expected that discrepancies will occur.

Under each of these strategies the athletes utilised one or several techniques to motivate themselves. The techniques identified in this study are positive self-talk, anchoring, association, dissociation, positive visualization, goal-setting, visualize negative outcomes, negative self-talk and faith. This is supported by research conducted on the facilitation of physical performance by means of a cognitive strategy (Morgan, Horstman, Cymerman & Stokes, 1983), goal-setting and exercise performance (Smith, Hauenstein & Buchanan, 1996), the effect of goal specificity, goal difficulty and duration of practice time intervals on muscular endurance performance (Bar-Eli, Tenenbaum, Pie, Btesh & Almog, 1997), the use of imagery in fencing, (Boron, 2002), the use of imagery in climbing (Boyd & Munroe, 2003), exercise imagery (Giacobbi, Hausenblas & Fallon, 2003), on the effects of brief yoga

exercises and motivational preparatory interventions in distance runners (Donohue, Miller, Beisecker, Houser, Valdez, Tiller & Taymar, 2006), self-talk and gross motor skill performance (Hardy, Hall, Gibbs & Greenslade, 2005). These studies support the findings of this study insofar as the use of motivational techniques. According to these studies the use of motivational techniques increased performance when compared to athletes who did not use motivational techniques. However, some studies like Schofield, Dickson, Mummery and Street (2002) illustrate the danger to the well being of endurance athletes when using inappropriate motivational techniques. According to this study inappropriate motivational techniques or the inappropriate use of motivational techniques can lead to psychological states such as depression and higher levels of pre-competitive anxiety. Therefore, although these studies confirm the use of motivational techniques in sport and specifically endurance sport and that they generally have a positive effect on performance, the results in terms of its' effect on performance is still ambivalent. However, many of these studies refer to sport in general or non-endurance sport. The influence of and effectiveness of motivational techniques on the performance of endurance athletes have not been extensively studied. There is therefore an opportunity to study the effect and effectiveness of motivational techniques on athletes during endurance events. Studies of this kind will fill the current lack in sport psychology literature. However, the aim of this study to identify motivational strategies and techniques was reached. In the next section the coping strategies utilised by athletes during endurance events will be discussed.

8.5 COPING STRATEGIES USED DURING ENDURANCE EVENTS

The majority of respondents (62%) prefer to utilise the strategy that changes the source of the stress whereas only 36% of the respondents utilises the strategy that changes the individual's perception of the stressor. This differs from previous studies (Van Breda, 2001). Only a small portion of the respondents (2%) utilised a strategy that focuses on the symptoms of the stress. This finding is supported by research conducted by Gould, Eklund and Jackson (1993), Stevinson and Biddle (1998), Dale (2000), Lazarus (2000) and Banghurst, Thierry, and Holder (2004). Additional research by Gould, Finch and Jackson (1993), Anshel and Kaissidis (1997) and Hardy and Gould *et al*. (in Weinberg & Gould, 2003) show that combinations of strategies seems to be most effective and that those athletes that were prepared for

unexpected situations (strategy that change the source of the stress) were more successful than athletes that did not prepare.

The endurance athletes in this study seem to prefer to place themselves in stressful situations. These athletes seem to have a perception that they are able to understand and control the outcome of most situations – specifically in endurance sport. Their own self-perception is that they can cope with the majority of stressors. This is supported by the theories of sense of coherence, self-efficacy and locus of control where the perception and ability to take meaning out of any given situation as well as the ability to understand and manage the situation is central to the individual's self-perception that is needed to cope with adversity. These findings are supported by research regarding anxiety and sport performance (Raglin, 1992), the relationship of coping and its perceived effectiveness to positive and negative affect in sport (Ntoumanis & Biddle, 1998) and gender differences in coping with enurance sport stress (Burton & Hammermeister, 2004).

However, this self-perception is only valid as long as it is tested on a regular basis. In other words, to reinforce their positive self-perception, endurance athletes continuously need to prove to themselves (and sometimes other people) that they can cope in difficult and possibly even life-threatening situations by participating in endurance events. This finding is supported by findings by Wurtele (1986), Lane, Jones and Stevens (2002) whose studies indicated that self-efficacy is the strongest predictor of performance for novice athletes, while previous performance is the best predictor for experienced athletes. Therefore, continued successful experiences in endurance events will increase self-efficacy to cope with difficulties and challenges. An important element of motivation and coping, specifically from the Salutogenic perspective, is the attitude that individual athletes have towards problems and difficulties. The results of this study in terms of this attitude will be discussed in the next section.

8.6 ATTITUDE TOWARDS PROBLEMS AND CHALLENGES

The greater majority of endurance athletes who participated in this study perceive problems and difficulties in a positive manner. They see them as challenges that can be overcome, as learning opportunities, and as opportunities for personal growth. Studies by Skirka (2000), Lane *et al*. (2002), Bandura and Locke (2003), Williams

(2003), Mummery, Schofield and Perry (2004), and Sheldon (2005) found that many successful athletes perceive problems as positive challenges and as opportunities for personal growth as well as opportunities to improve their mastery of their sport discipline. Although the majority of these studies were done on non-endurance athletes, their findings support the results of this study.

8.7 SELF-PERCEPTION OF ENDURANCE ATHLETES

All the athletes in this study believe that they have the ability to overcome at least some of the challenges of endurance sport. The responses could be divided into three groupings; those who believe that they have the ability to overcome all challenges, those who believe that they will be able to overcome most challenges, and those who believe that they will be able to overcome some of the challenges. These findings are fully supported by theory and research conducted on recycling misconceptions of perceived self-efficacy (Bandura, 1984), the effects of personal and competitive self-efficacy and differential outcome feedback on subsequent self-efficacy and performance (Taylor, 1989), self-efficacy and health behaviours (Schwarzer and Fuchs in Conner and Norman, 1995), negative self-efficacy and goal effects (Bandura & Locke, 2003), the role of coping style, social support and self-concept in resilience of sport performance (Mummery *et al*., 2004), and physical and psychological predictors of perceived ability in adult male and female tennis players (Sheldon, 2005).

These studies indicate that a positive perception of own abilities (self-efficacy) is characteristic of successful athletes. It predicted successful performance during sporting events and was also shown to be an indicator of general well being. Furthermore, they believe that they have sufficient resources available to overcome these challenges and that the pursuit of these challenging situations is meaningful. These studies are grounded in theory and specifically that of the social learning theory. An interesting trend is that even those athletes who are unsure of their ability to overcome all challenges attribute this to a lack of effort, training or control over the situation – not necessarily lack of ability. By training harder, preparing and planning better and by learning from previous mistakes, they perceive that they will be able to overcome the challenges of endurance sport.

8.8 SUMMARY

In this study answers have been given to questions that previously have been unanswered or where assumptions had to be made based on previous research. In many cases this research has not been entirely applicable to endurance sport or even the South African environment. This can be seen in results of this study that do not reflect the normal trend of previous research results. Several new and interesting research findings in terms of motivation, rewards, coping strategies and stressors in sport and specifically endurance sport have been identified that should be further explored.

Findings of this study are that environmental factors are perceived to have a physical and mental impact on performance. The perception of this impact differs and can be positive, negative or neutral depending on situational factors.

Motivational strategies that are employed during endurance events by athletes to motivate themselves to overcome the challenges are the result of two factors: focus of motivation and source of motivation. By combining these two factors four motivational strategies or styles were identified: positive-internal, positive-external, negative-internal and negative-external of which positive-internal were most frequently used followed by negative-internal, positive-external and negative-external. It seems as if endurance athletes most frequently focus on the positive outcomes of performance in endurance events coupled with the internal rewards thereof to motivate themselves to overcome challenges in endurance events.

Endurance athletes used all three coping strategies that were identified in the literature. The most frequently used strategy was to remove the source of the stress, followed by strategies that changes the athlete's perception of the stressor and that focuses on the symptoms of the stress.

Endurance athletes perceive themselves able to overcome the challenges of endurance events. However, this ability must constantly be tested by participation in endurance sport or other stressful situations. Previous successful participation in endurance events or other stressful situations leads to an increase in positive self-perception of own abilities as well as an increase in performance in endurance events.

By answering the research questions this study can be considered a success in the sense that all the questions have been (at least partially) successfully answered. However, to claim that this study is without shortcomings would be unwise and detrimental to science. In the next chapter the shortcomings and practical applications of this study will be discussed.

CHAPTER 9

LIMITATIONS, RECOMMENDATIONS AND PRACTICAL APPLICATION OF RESULTS

"It is not the critic that counts…it's not the man who points out how the strong man stumbled…Credit belongs to the man who really was in the arena, his face marred by dust, sweat and blood, who strives valiantly, who errs to come short and short again, because there is no effort without error or shortcoming. It is the man who actually strives to do the deeds, who knows the great enthusiasm and knows the great devotion, who spends himself in a worthy cause, who at best knows in the end the triumph of great achievement. And who, at worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and cruel souls who know neither victory nor defeat".

- **Teddy Roosevelt**

9.1 INTRODUCTION

The aim of this chapter is to analyse and discuss the limitations of this study. Secondly, to recommend further research areas and lastly, the practical applications of the results of this study. Thus, the chapter will be divided into two sections under the following headings:

- Limitations of the study and recommended research areas;
- Practical application of results.

9.2 LIMITATIONS OF THE STUDY AND RECOMMENDED FUTURE RESEARCH

One of the most obvious limitations is one that is probably common to all descriptive explorative studies – too broad a scope.

As can be seen from the results of this study there are several topics that on their own would have been sufficient for a doctoral study. Motivational strategies alone

would have been sufficient. The same is true for coping strategies or stressors. The result of this is that the study might be too broad in its' findings instead of being deeper in one or two areas. The positive side to this limitation is that a large amount of groundwork for further studies in specific areas (such as motivation) has been done through this study.

The basic theoretical approach of this study was the Salutogenic Model of Health and although this model has been used successfully to theoretically explain coping strategies as well as motivational strategies, there was one limitation to this study. The use of the psychometric test, the sense of coherence (SOC), would have confirmed the assumptions of the strength of the respondents' SOC made based on their responses. It is therefore, recommended that future studies, specifically those that focus on coping strategies include the use of the SOC.

Although the respondents approximately represent the general population of South Africa, the lack of Asian endurance athletes as well as athletes in the age group 40 to 49 years is a limitation. The implication of this distribution is that the results of this study might not be applicable to endurance athletes in the age group 40 to 49, nor Asian endurance athletes. This limitation is due to the fact that an availability sampling method has been used. This was necessary due to the difficulty of finding enough respondents to use a stratified random sampling method. However, it is recommended that future studies make use of random sampling or stratified random sampling methods to select respondents.

This study provided answers as to how endurance athletes experienced these environmental stressors as well as the subjective perception of the influence of environmental factors on their performance. An in-depth study of each of the environmental stressors and the influence of each on the performance of endurance athletes is recommended.

The lack of a clear objective measurable definition of endurance sport is a limitation not only in this study but also in sport psychology literature in general. Fortunately, this limitation did not have a serious impact on this study, as the explorative nature of the study did not necessitate an objective measurable definition. However, this limitation might have serious implications for future studies, specifically quantitative studies.

This study focused on the individual endurance athlete. It is recommended that future studies also focus on the effect of environmental factors on other aspects of endurance sport such as teamwork.

As seen in this study, several other stressors such as teamwork, injuries, other competitors for example have been identified. The effect of these stressors on endurance athletes as well as their performance needs to be studied.

It would seem as if there is a general lack of research on the psychological aspects of endurance sport in South Africa. Applicable to this study is the lack of knowledge on the motivations of endurance athletes to start and to continue with endurance sport. The varied cultural and ethnic background of the South African population makes such a study necessary.

This study described the stressors involved in endurance sport, motivational and coping strategies employed during endurance events, endurance athletes' self-perception of their ability to cope with challenges during endurance events, as well as their philosophical view of problems or challenges. However, this study did not focus on the development process of coping strategies, motivational strategies or the philosophical view of problems (or SOC).

A study of the development process of coping strategies, motivational strategies and the SOC will not only enable a better understanding of these concepts, but will also enable the development of training programmes to develop and enhance these skills in endurance athletes. Furthermore, this study did not focus on the development of the resources that enable endurance athletes to cope and thrive with the difficult and challenging situations found in endurance sport. It is therefore, recommended that this development process should be studied.

Although the study did briefly focus on emotion-focused coping strategies as well as avoidant coping strategies, the lack of an in-depth study of these two coping strategies is a limitation that needs to be rectified with future research.

It is recommended that a study be undertaken to determine the effect of endurance sport participation on the development of SOC, coping strategies, motivational strategies and self-esteem.

An important study would be to compare the coping ability of endurance athletes with non-endurance athletes as well as to see if the coping strategies and motivational strategies used during endurance events are transferable to other life situations. An important study would be on specialist groupings in the SANDF and SAPS. Groupings such as the SA Special Forces, Parachute Regiment, Infantry Corps, SA Navy Divers and SAPS Special Task Force work under similar conditions as endurance athletes and face similar if not worse environmental stressors. If research on these groupings indicates similar findings to this study, the results can be used for training and development, recruitment and selection. In the next section, the practical applications of the study's findings will be discussed.

9.3 PRACTICAL APPLICATIONS OF THE RESEARCH RESULTS

Theoretical research is of extreme importance for any science as this forms the basis of future research and increasing subject knowledge. However, as important as theoretical research is the need for research to be useful in the practical setting. This is important for all applied sciences and even more important for emerging sciences. Although sport psychology cannot be classified as an emerging science per se, it certainly is in the South African setting. South Africa and South African athletes are only recently starting to discover the application value of sport psychology. Therefore, to enhance the need for and importance of sport psychology research need to be useful for sport practitioners (athletes, coaches and sport psychologists). This chapter aim to provide some of the practical applications of the results of this study as well as a brief discussion of how the results will be useful to sport practitioners. The main focus of this study was on the stressors encountered in endurance sport, strategies and techniques used to motivate athletes to overcome the stressors of endurance events and the strategies employed by athletes to cope with the stressors of endurance events.

The most obvious practical application of the research results would be the transfer of this knowledge through training or development courses. These courses could enable endurance athletes, coaches of endurance athletes and sport psychologists to develop a better understanding of the general motivational and coping factors involved in endurance sport. This knowledge can be used to select and develop individuals with potential to become endurance athletes by developing the attitudes, strategies and skills needed to overcome the physical and mental challenges of

endurance sport. Knowledge and understanding of concepts such as stressors, motivational strategies and techniques and coping strategies are important as it will enable endurance sport practitioners to know how these factors influence performance on a physical and mental level. By understanding concepts such as stressors, motivational strategies and techniques and coping strategies, endurance athletes develop an understanding of themselves. Understanding of themselves would enable endurance athletes to increase their self-knowledge, thereby increasing their performance. Individual reactions at different times would enable endurance athletes to understand their rhythm of their own performance. This would not only enable athletes to increase their own performance but could have beneficial effects for team dynamics.

As seen in chapter 7, team dynamics is one of the factors that is perceived as a stressor in endurance sport. Not only is it perceived to be a stressor, but also an “unnecessary” stressor. One of the reasons for this perception is the fact that inexperienced team members in endurance sport do not know each other or the individual reactions to the different stressors. By understanding individual differences in reactions to stressors as well as differences in coping and motivational strategies will enable team members to understand each other better. This understanding will enable to team members to support each other better and that could lead to increased team performance. The results of this study could therefore be used as part of team-building programmes as well as individual development.

An understanding of the concepts of this study such as stressors as well as the influence thereof, motivational and coping strategies will enable sport psychologists to develop interventive therapies to enable endurance athletes to overcome the stressors. By focusing on the motivating factors, inexperienced endurance athletes can be taught strategies to motivate themselves before events to train and prepare themselves for these events. Furthermore, athletes can be taught motivational strategies to ensure continued performance in endurance events over extended periods of time.

As seen in chapter 7, motivating factors are the basis for participation in endurance sport. An additional use of an interventive programme dealing with motivating factors might be for endurance athletes that have sustained injuries to develop motivational strategies to enhance their recovery process. Marketing of endurance sport and events is a field of application that can benefit from the results of this study.

Marketing aims to attract people to participate in endurance events or endurance sport by using messages that consciously or unconsciously change their perception of endurance events or endurance sport. Therefore, by focusing these messages on the motivating factors as identified in this study will enable more effective marketing of endurance events or endurance sport. This is particularly important in South Africa where endurance sport can be considered an emerging sport when compared with sport disciplines such as soccer or rugby. In addition to improving the marketing of endurance sport, the results of this study, specifically the type of rewards, would enable the organisers of endurance events to improve the type of rewards given to participants of endurance events. This will not only motivate experienced athletes to participate and perform well, but will also draw more non-elite athletes to endurance events. The importance of "recruiting" new participants to endurance sport, especially from previously disadvantaged communities, cannot be stressed enough. Endurance sport has the potential to become one of the sport disciplines that have numerically the most participants of all sport disciplines in South Africa. This can be seen from the number of participants in events such as the *Comrades Marathon*, *The Pick and Pay 94.7 Cycle Challenge* or the *Pick and Pay Cape Argus Cycle Challenge*. Each of these events draws between twelve and thirty thousand participants. However, these events (as well as a few others) are exceptions that prove what good marketing can do as well as the potential for expansion in the sport. The majority of events are not well attended either by athletes, sponsors or spectators. Using the results of this study, specifically the type of rewards and motivating factors, will enable sport administrators to develop marketing strategies to promote endurance events and endurance sport.

If future research does indicate similar findings, the results of this study would be of particular use to specialist groups in the SANDF and SAPS such as the SA Special Forces, Parachute Regiment, Infantry Corps or SAPS Special Task Force. These groupings work under similar conditions as endurance athletes and are exposed to similar if not worse environmental stressors. If research on these groupings indicates similar findings to this study, the results can be used for training, development, recruitment and selection.