

THE NATURE OF MENTAL TOUGHNESS IN SPORT

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ABSTRACT

This study investigated the components of mental toughness as reported by 131 expert coaches and 160 elite athletes from 31 sport codes. The written statements of coaches and athletes were analysed by means of an inductive content analysis. This resulted in the identification of 12 components of mental toughness. These are: motivation level, coping skills, confidence maintenance, cognitive skill, discipline and goal-directedness, competitiveness, possession of prerequisite physical and mental requirements, team unity, preparation skills, psychological hardiness, religious convictions and ethics. The coaches regarded concentration as the most important characteristic, while the athletes regarded perseverance as most important. The coaches rated the effectiveness of coaches and sport psychologists in strengthening the characteristics of mental toughness more highly than athletes did.

Key words: Mental toughness; Sport psychology; Elite sport.

INTRODUCTION

It is generally believed that mental toughness has a strong influence on personal excellence in competitive sport (Williams, 1988; Hodge, 1994). If the elements of mental toughness that influence performance can be identified and understood, they can be taught to and utilised by athletes to enhance their performance (Graham, 1990; Loehr, 1994; Sargeant, 1998).

In a broad sense mental toughness is regarded as the ability to deal with stress and adversity in such a way that performance does not suffer under conditions that place high physical and psychological demands on the competitor (Smith & Smoll, 1989). This implies that, under competitive pressure, athletes can continue to think productively, positively, and realistically and do so with composed clarity (Loehr, 1994). Mental toughness needs an element of relaxedness, but at the same time requires commitment and courage (Jennings, 1993).

Being tough mentally means that the athlete has acquired skills in thinking, believing and visualisation that enable him/her to effortlessly access empowering emotions during competition. The athlete is also able to promptly alter his/her emotional state from a negative to a positive one, cope emotionally with setbacks and failure, trigger an ideal performance state when needed and cope with crisis and misfortune (Loehr, 1994).

There is a dearth of studies dealing specifically with the elements of mental toughness. Four such studies were found. The first was that of Dennis (1978) who used a scale to determine an athlete's mental toughness by analysing the answers to five questions using a 5-point Likert scale. The validity or reliability of this scale in determining mental toughness, has not been established. A study by Davis and Zaichkowsky (1998) determined mental toughness by means of the subjective ratings of the five on-ice behaviours of: adversity response, over-

achievement, effort, enthusiasm and skill. These show some similarity to the components that were identified in the present study.

Two Korean studies by Dongsung and Kang-Heon (1994) and Kang-Heon *et al.* (1994), used the *Mental Toughness Test (MTT)* developed by Loehr (1982). This test determines mental toughness according to the following seven factors: self-confidence, arousal control, attention control, visualisation and imagery control, motivation level, positive energy and attitude control. These too show some resemblance to the identified components.

PURPOSE OF THE STUDY

The aim of the study was to identify the elements of mental toughness as perceived by expert coaches and elite athletes.

METHODOLOGY

Sample

In total 114 provincial and national sport bodies were contacted by e-mail (n=43), post (n=32), fax (n=25) and personal contact (n=14). In total 65 bodies replied to the request and supplied a list of their top coaches.

The information obtained was used to send questionnaires to 284 coaches. In total 140 questionnaires were returned, which gives a response rate of 49%. Only questionnaires returned by coaches who met the following criteria were used for analysis: They had to (1) coach either provincial, national or international athletes, (2) complete the biographical information, (3) return both pages of the questionnaire, (4) fall into the category of coach, not lecturer. These requirements led to nine coaches' questionnaires being eliminated. In total the questionnaires of 131 elite South-African coaches from 30 different sport bodies were used.

Coaches

The ages of the coaches ranged from 22 to 85 years with a mean of 42.7 years. The average number of years that these coaches had been coaching was 14.3 years, ranging from one to 42 years. There were 53 Afrikaans-speaking and 78 English-speaking coaches. These included 93 male and 38 female coaches. The sample consisted of 49 provincial coaches, 42 national coaches and 40 international coaches.

Athletes

A total of 239 questionnaires were distributed to athletes. In total 231 questionnaires were returned, giving a 97% response rate. Unfortunately 71 questionnaires had to be excluded because they did not meet the following criteria: Athletes had to (1) participate at a provincial, national, international or 1st team university level, and (2) complete the entire questionnaire. A total of 160 questionnaires from 31 different disciplines of sport were analysed.

The ages of the athletes ranged from 14 to 35 years with a mean of 21 years. There were 70 Afrikaans-speaking and 90 English-speaking athletes. Eighty-seven respondents were male and 73 were female athletes. These included 12 university, 47 provincial, 50 national and 24 international athletes.

The questionnaire

The questionnaire consisted of two sections. The first part dealt with biographical factors such as age, gender, sport code, sport experience, etc. In the second section the respondents were requested to list the characteristics of an athlete who is mentally tough. Respondents were also required to rank the first three factors in order of importance. The last two items in the questionnaire measured the extent, on a scale ranging from 1 (“not at all”) to 10 (“to a great extent”) to which the coach and psychologist could strengthen these characteristics in an athlete.

Content analysis

Content analysis is a technique used to interpret words or statements to better understand the perspective of the author or speaker of these words or statements. The researcher needs to understand concepts from the subject’s viewpoint by methodically and objectively identifying special characteristics before conclusions can be drawn from collected data (Berg, 1998).

Objective content analysis of data can only be accomplished when specific rules, called the criteria of selection, are applied during the analysis process. The selection criteria should account for each variation in the content of the data and must be rigidly and consistently applied during the analysis process. This procedure is necessary to ensure that other researchers, looking at the same raw data, would obtain similar or comparable results.

Content analysis organises raw data into interpretable and meaningful themes and categories. The categories that emerge should reflect all relevant aspects of the data and retain, as far as possible, the exact wording used in the data. This ensures that all material is included and not only the data that supports the researcher’s assumptions or preconceived ideas (Dey, 1993).

Themes are developed from the data by using either deductive or inductive content analysis procedures. The deductive approach involves using a predetermined set of themes and categories to organise statements or words, while the inductive process allows the themes and categories to emerge from the statements (Patton, 1980). Abrahamson (in Berg, 1998) indicates that an inductive approach begins with the researcher assimilating the information in order to identify the dimensions or themes that seem meaningful. In a deductive approach, the researcher uses a categorical scheme suggested by a theoretical perspective and the statements provide a means for assessing his/her hypotheses. Berg (1998) maintains that the use of inductive categories permits the researcher to link or ground these categories to the data from which they are derived. The development of categories must be decided upon from inductive references that are concerned with the patterns that emerge from the data.

The inductive building process of identifying emergent themes from statements, is similar to a conceptual factor analysis. It begins with the clustering of the statements around underlying commonalities (Glaser & Strauss, 1967). The underlying commonalities represent the emergent themes. Clustering involves comparing and contrasting each statement with the other statements and emergent themes in order to unite statements with similar meaning and separate statements with different meanings (Glaser & Strauss, 1967; Patton, 1980). Similar statements with the same underlying theme are combined to form higher order themes. These are organised into increasingly more complex themes and categories.

To be able to demarcate a theme as meaningful, the following three criteria have to be met (Krippendorff, 1980; Patton, 1980): Firstly, each individual theme, regardless of level of analysis, has to be inclusive. An inclusive theme adequately captures the clustering of lower order themes that comprise it. Secondly, all themes within a given level of analysis should be mutually exclusive, or distinct from each other. Thirdly, a higher level of analysis should have captured most of the lower order themes, leaving as few as possible unclustered themes.

Before the process of content analysis could begin, the questionnaires that had been answered in Afrikaans had to be translated into English. This was deemed necessary to simplify the analysis process.

A total of 1 093 statements were obtained from the coaches and 1 173 from the athletes. These totaled 2 266 statements, which varied in length from a word to a sentence and comprised the raw data for the content analysis.

A coding procedure was used to categorise the statements into themes to facilitate the handling of so many responses. The statements were codified and then sorted into the different categories using the Microsoft Excel program. This resulted in 534 statement categories from the coaches and 488 from the athletes.

Berg (1998) explains that arriving at the first coding categories is often a multileveled process that requires several successive sortings of all statements under examination. He describes the process with the researchers beginning with a general sorting of cases (statements) into some specified special class and then identifying the themes that emerge through repeated application of the analysis process.

The identified categories were printed and further analysed to identify sub-themes within a higher order theme. Each statement's frequency was determined by allocating the value of one to each characteristic that the subjects (coach or athlete) mentioned. Each statement subsequently had a number of 1s in the row next to it and these numbers were then summed to calculate the frequency.

Counting of the statements provides a means of identifying, organising, indexing and retrieving data (Berg, 1998). By reporting the frequency with which a given concept appears in text, the magnitude of the observation is suggested. Berg (1998) states that it is appropriate to use a frequency calculation to indicate the magnitude of certain responses; however, it is not appropriate to attach cause to these calculations.

Miles and Huberman (1994) explain that counting is used when the researcher identifies themes or patterns in the collected data. Themes are isolated when it (the theme) occurs a number of times and/or when it happens consistently in a specific way. These judgements of the frequency and consistency of a theme are based on counting. Miles and Huberman (1994) contend that there are three reasons to use numbers. These are: (1) to quickly see what kind of information is included in the data, (2) to verify a hunch or hypothesis and (3) to keep the researcher analytically honest, in other words to protect against bias.

The statements that had the highest frequencies were tentatively chosen as higher order theme titles, while other statements that matched the general theme, were arranged and sorted under

these titles. New themes were created from the statements that did not fit. The few remaining unclustered themes were either disregarded if they could not be distinguished, or retained if their frequencies were sufficiently high enough to warrant a separate category.

Consensual validation was gained after the whole process of inductive content analysis had been completed. The supervisor of this study as well as a senior lecturer in motor learning provided validation by checking the themes and making suggestions.

RESULTS

Inductive content analysis

The characteristics of mental toughness, as identified by the coaches and athletes, are presented in descending order from the highest order themes through to the respective lower order themes. The twelve highest order mental toughness themes emerging from the inductive content analysis include in order of appearance: motivation level, coping skills, confidence maintenance, cognitive skill, discipline and goal-directedness, competitiveness, possession of prerequisite physical and mental requirements, team unity, preparation skills, psychological hardiness, religious convictions and ethics.

Motivational level

The first of the highest order themes emerging from the inductive content analysis is motivation level. Motivation level is defined as the ability of the athlete to show perseverance, determination, desire, responsibility and commitment. This theme emerged from the five first level themes presented in order of appearance, namely: perseverance, determination, desire, responsibility and commitment.

Coping skills

Coping skills is defined as the ability of the athlete to reveal his/her coping ability, demonstrate composure, acceptance, activation control and adaptability. The five first level themes were: coping ability, composure, acceptance, activation control and adaptability.

Confidence maintenance

Confidence maintenance is the ability to reveal competence, self-confidence and attitude. The three first level themes from which this theme emerged were: competence, self-confidence and attitude.

Cognitive skill

Cognitive skill pertains to the ability to concentrate, focus, think, make decisions and analyse. The five first level themes presented in order of appearance, were: concentration ability, focus ability, thinking ability, decision-making ability and analysing ability.

Discipline and goal-directedness

Discipline and goal-directedness refer to the ability of the athlete to display discipline, a goal-orientation and idealism. This theme emerged from the following three first level themes: discipline, goal-orientation and idealism.

Competitiveness

Competitiveness is seen as the ability of the athlete to display the appearance of a winner, maintain consistent performance, reveal a high competitive level and big match temperament. This theme emerged from the five first level themes presented in order of appearance, namely: will, appearance of a winner, consistent performance, high competitive level and big match temperament.

Possession of prerequisite physical and mental requirements

Possession of prerequisite physical and mental requirements refers to the ability of the athlete to display strong physical and mental conditioning, an ability to cope with pain and to demonstrate self-sacrifice. This theme emerged from the three first level themes presented in order of appearance, namely: high physical and mental conditioning, ability to cope with pain and self-sacrifice.

Team unity

Team unity is defined as the ability of the athlete to reveal respect, team cohesion and relationship skills. These also were the three first level themes.

Preparation skills

Preparation skills refers to the ability of the athlete to display balance, balanced preparation and visualisation. This theme emerged from the three first level themes of balance, balanced preparation and visualisation.

Psychological hardiness

Psychological hardiness is defined as the ability of the athlete to reveal a strong personality, emotional and psychological well-being, to take charge and show autonomy. The four first level themes from which this theme emerged, were: strong personality, emotional and psychological well-being, charge-taking and autonomy.

Religious convictions

The eleventh of the highest order themes emerging from the inductive content analysis was an unclustered theme. Religious convictions are defined as the religious beliefs of the athlete. This theme emerged from the single first level theme, namely: religious beliefs.

Ethics

The last of the highest order themes, namely ethics, was also unclustered. This deals with the athlete's sense of righteousness.

Frequency data

The following patterns emerge when the percentages and actual numbers of the themes are examined:

- Motivation level was mentioned most often in total (24.58%) as well as individually by both the coaches (20.86%) and athletes (28.05%).
- Coping skills (13.9%), confidence maintenance (12.36%), cognitive skills (12.27%) and discipline and goal-directedness (10.33%) were mentioned almost equally frequently.
- Competitiveness (7.86%), possession of prerequisite physical and mental requirements (6.66%), team unity (4.24%), preparation skills (3.35%) and psychological hardiness (3.18%) were again mentioned almost equally.
- Religious convictions (1.1%) and ethics (0.18%) were mentioned the least.

The coaches' and athletes' raw score contribution to each identified theme shows the following patterns: The coaches and athletes contributed almost equally to the themes that were identified. The coaches contributed more to the following characteristics: team unity, possession of the prerequisite physical and mental requirements, cognitive skill and preparation skills. The largest contribution was to the team unity theme (62.5%). The athletes contributed most to the ethics theme (75%), but this theme was only mentioned four times in total. Therefore, the next highest difference (18%) between the contribution of the coaches (41%) and athletes (59%) is that of motivation level. Both the athletes and the coaches contributed almost evenly to the confidence maintenance theme and that of discipline and goal-directedness. The reader is reminded that these percentages represent the contribution to the single theme and not the theme's importance to mental toughness.

The coaches and athletes were asked to rank their identified characteristics of mental toughness. Table 1 lists the 10 highest ranked characteristics as rated by the coaches and athletes individually. The percentage, with which each characteristic was mentioned, is computed by taking into account the number of subjects in the group of coaches and athletes respectively. The characteristic ranked highest by the coaches is concentration (25%), while this characteristic was only ranked highest by 13% of the athletes. Perseverance was ranked highest by 27% of the athletes and 22% of the coaches. When the coaches' and athletes' frequencies are combined the highest ranked characteristic is perseverance, with 25% of the total combined sample.

TABLE 1. COACHES' AND ATHLETES' 10 MOST IMPORTANT CHARACTERISTICS

Coaches (n=131)			Athletes (n=160)		
Characteristics	<i>f</i>	%	Characteristics	<i>f</i>	%
1. Concentration	33	25.2	1. Perseverance	43	26.9
2. Focus	31	23.7	2. Determination/determined	41	25.6
3. Perseverance	29	19.8	3. Disciplined (during practice and games)	32	20
4. Determination	26	19.8	4. Motivation/motivated (positively)	31	19.4
5. Discipline	23	17.6	5. Focus/focused	28	17.5
6. Self-confidence	22	16.8	6. Commitment/committed	26	16.3
7. Dedication	20	15.3	7. Confidence/confident	24	15
8. Confidence	18	13.7	8. Self-confidence	23	14.4
9. Motivation	18	13.7	9. Dedication/dedicated	22	13.8
10. Self-belief	15	11.5	10. Goal-orientated/directed	22	13.8
11. Will to win	14	10.7	11. Concentration	21	13.1

The last part of the questionnaire asks the coaches and athletes to determine how effective they would judge a coach and sport psychologist respectively in the strengthening of an athlete's mental toughness. Table 2 presents the descriptive statistics of the coaches' and athletes' rating of both a coach and sport psychologist respectively. To determine whether or not any significant differences at an α level of 0.05 existed, four different two tailed t-tests were performed.

TABLE 2. RATING OF COACHES' AND SPORT PSYCHOLOGISTS' ABILITY TO TEACH MENTAL TOUGHNESS

Subjects	<i>M</i>	<i>SE</i>	<i>SD</i>	<i>s</i> ²	<i>ax</i>	<i>N</i>
Coaches						
Coach' rating	7.74	0.144	1.65	2.713	1014	131
Sports psychologist's rating	8.03	0.161	1.85	3.408	1052.5	131
Athletes						
Coach's rating	6.77	0.135	1.7	2.899	1082.5	160
Sport psychologist's rating	7.46	0.143	1.81	3.278	1193	160

Firstly, the coaches' ratings of a coach and sport psychologist were tested for significance. Although the rating by the coaches of the sport psychologist seems higher than that of a coach, no significant difference could be found ($t=-1.36$ and $t=0.05$ ($257df$)= 1.96 , $p>0.05$).

Secondly the athletes' ratings of a coach and sport psychologist were tested for significance. Although the rating by the athletes of the sport psychologist seems higher than that of a coach, no significant difference could be found ($t=-3.515$ and $t=0.05$ ($317df$)= 1.96 , $p>0.05$).

Thirdly, a coach's rating by the coaches and athletes was tested for significance. A significant difference could be found ($t=4.931$ and $t=0.05$ ($289df$)= 1.96 , $p<0.05$). The coaches judged a coach to be more effective in strengthening the characteristics of mental toughness than the athletes did.

Lastly, a sport psychologist's rating by the coaches and athletes was tested for significance. A significant difference could be found ($t=2.686$ and $t=0.05$ ($289df$)= 1.96 , $p<0.05$). The athletes judged the effectiveness of a sport psychologist in the strengthening of mental toughness, lower than the coaches did.

It is interesting that no significant differences could be found in the ratings by the coaches and athletes individually, of a coach or a sport psychologist. This probably shows that within their groups, the coaches and athletes are aware that both a coach and sport psychologist are able to strengthen the characteristics of mental toughness. Interesting is that when the coaches' and athletes' rating of a coach and sport psychologist is compared, the coaches find both a coach and sport psychologist to be more effective than the athletes do. This is probably due to the fact that the coaches have more experience in, knowledge of and exposure to the expertise of both coaches and sport psychologists alike.

DISCUSSION

Due to a dearth of studies dealing with the subject of mental toughness, it is not possible to refer to any studies that deal specifically with the above-mentioned identified components. It is thus impossible to support or exclude any of the themes that were inductively identified via the content analysis of the coaches' and athletes' statements surrounding mental toughness.

The coaches and athletes were quite varied in their description of the characteristics of mental toughness. It can, however, be concluded that an athlete's motivation is very important to both coaches and athletes when mental toughness is exhibited. The coaches regard team unity as an essential characteristic in mental toughness. Further research has still to be done in order to finalise a working definition of mental toughness in modern sports.

The themes *religious convictions* and *ethics* identified by the coaches and athletes are not mentioned in the literature. This could be ascribed to the coaches and athletes not being scientists who need to explain phenomena according to measurable yardsticks. Coaches and athletes are probably more inclined to attribute exceptional performance in sport to spiritual and non-measurable influences.

From the perspective of the coaches and athletes it can be concluded that in order for athletes to display mental toughness, the following should be considered:

- The maintenance of their motivation levels, coping skills, confidence, cognitive skill and discipline and goal-directedness is considered important and these can be developed through thorough training.
- The possession of the prerequisite physical and mental requirements can only be achieved through the appropriate preparation skills.
- Athletes should develop the necessary psychological hardiness.

- Athletes should have strong ethics and/or religious convictions.
- In team sports, the concept of team unity should be emphasised.

Ideally, research on mental toughness should be so extensive that sport psychologists will be able to evaluate athletes' mental toughness and then develop programmes that will enable them to realise their potential.

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