

# Discovering Mental Toughness: A Qualitative Study of Mental Toughness in Elite Athletes [R]

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What is mental toughness? This research draws on the experience of elite athletes and coaches to unearth a conceptualisation and definition of mental toughness. The interviews of 33 elite athletes and coaches (including 25 current or former elite athletes, of whom 15 had achieved an Olympic Gold Medal or World Champion status) were transcribed verbatim and analysed qualitatively to reveal underpinning components of mental toughness. Mental toughness is multi-dimensional and consists of twelve components, including: self-efficacy, potential, mental self-concept, task familiarity, value, personal bests, goal commitment, perseverance, task focus, positivity, stress minimisation, and positive comparisons. Mental toughness is defined as an unshakeable perseverance and conviction towards some goal despite pressure or adversity. This conceptualisation of mental toughness provides a platform from which instruments of measurement can be developed.

*She just had this ability to overcome adversity, she always did... and she would just find ways to push herself through whatever she needs to push through... I think her mother had died of cancer five or six years ago, and her brother got killed this year and she's somebody who always seems to emerge from beyond whatever she's dealing with, to get through it and surpass what anybody would think you could do. She's tough, she'll go that extra yard, that extra hard yard that most people won't.*

What exactly does it mean to be mentally tough? The above quote from an elite sportsman in this study is highly representative of how coaches and athletes alike can readily identify someone in terms of their mental toughness. Yet, despite this apparent understanding, little has been done to develop the concept from a theoretical basis. Indeed, the term mental toughness remains inadequately defined and conceptualized. Stemming from these inadequacies, measurement of mental toughness remains illusive elusive? Therefore, this paper's primary aim is to learn more about mental toughness from "expert" sources – elite athletes and coaches familiar with mental toughness. The primary yield of this study is a definition and conceptualization of mental toughness that is based on sound research methods. This significant work will provide the platform needed to pursue measurement approaches in future work.

## In Search of Mental Toughness

Sport psychologists (researchers and practitioners), coaches, sports commentators, sports fans, and athletes acknowledge the importance of mental toughness in sporting performance (see Goldberg, 1998; Hodge, 1994; Tunney, 1987; Williams, 1988). In early work on the issue, Loehr (1982, 1986) emphasised that athletes and coaches felt that at least fifty percent of success is due to psychological factors that reflect mental toughness. Similarly, Gould, Hodge, Perterson, and Petlichkoff (1987) emphasised that coaches feel that mental toughness is important in achieving success, while Norris (1999) has emphasised the importance of mental toughness in developing champion athletes.

Despite widespread agreement on the importance and benefits of mental toughness and calls to identify psychological attributes that create champions, high quality research into mental toughness is limited. In one study of mental toughness, Fourie and Potgieter (2001) analysed written responses from 131 expert coaches and 160 elite athletes. Their analysis identified twelve components of mental toughness including: 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, and ethics. In contrast to Jones et al. (2002), the researchers suggested that further work was needed to finalise a working definition of mental toughness.

Most recently, Jones, Hanton and Connaughton (2002) conducted a qualitative study of elite athletes, aiming to define mental toughness and to determine the essential attributes required to be a mentally tough performer. The definition that emerged from their analysis concluded that:

*Mental toughness is having the natural or developed psychological edge that enables you to: 1) Generally, cope better than your opponents with the many demands (competition, training, lifestyle) that sport places on a performer; and, 2) Specifically, be more consistent and better than your opponents in remaining determined, focused, confident, and in control under pressure. (p. 209)*

They also identified twelve attributes of mental toughness. These attributes include self-belief, an unshakeable focus, high levels of desire and determination (especially at times of distress), and overall consistency of effort and technique despite life and sport stresses. The strength of their research is that multiple components of mental toughness are identified – thus reinforcing the notion that mental toughness is multidimensional. Unfortunately, the definition presented remains inadequate in that it describes what mental toughness allows one to do, rather than defining mental toughness itself.

Furthermore, little attempt was made to establish or draw upon any theoretical background in the understanding of these mental toughness attributes. When qualitative data are presented in this way, what results is simply a description of what participants said, without any attempt to integrate established theory. Probably the most significant weakness in the area of mental toughness research is the dearth of information establishing any kind of theoretical background. For this reason, the current study draws knowledge significantly from the participant, but is guided by established theory. This approach signifies the birth of mental toughness theory.

Despite significant recent attempts, the concept of mental toughness remains inadequately defined and conceptualised. This study attempts to progress the area by intertwining sound qualitative practice with guidance from relevant established theory, in the development of mental toughness definition and conceptualisation. Indeed, the overarching aim is to develop an understanding of mental toughness that is based on experience tied with theory, providing an excellent platform to explore measurement and training.

### **Statement of the Aims**

The broad aims of this investigation were to draw upon both qualitative data and established theory to develop a theoretical understanding of mental toughness. To this end, both the qualitative data and established theory were explored jointly to identify and clarify constructs relevant to mental toughness. These constructs were taken together to develop a conceptual model of mental toughness that subsumes the factors of mental toughness in a way that lends clarity to the construct but is also useful to athletes and coaches from a practical perspective. Hence, data and theory are considered jointly to identify and clarify constructs relevant to mental toughness and to develop a framework within which they and their inter-relationships can be considered. The specific yields of this work are: mental toughness theory, definition and a conceptual model (including the factors that comprise it).

### **Method**

#### *Qualitative Research Methods*

Grounded theory was the qualitative method employed for this research. The grounded theory approach involves letting themes and understandings emerge or originate from the qualitative data. Quantitative research is generally deductive, that is, it begins with an hypothesis and data are gathered which either accepts or rejects the hypothesis (Bolwing, 1997; Silverman, 2000). In qualitative research, and particularly when adopting the grounded theory approach to qualitative research, it is common to use inductive logic which involves the generation of theories from analysis of data (Bowling, 1997; Mile & Huberman, 1994). In this way, theory is generated “in intimate relationship with the data, with the researchers fully aware of themselves as instruments for developing that grounded theory” (Strauss, 1987, p.6). A grounded theory approach to studying mental toughness was adopted for this investigation because this approach is considered the appropriate method for the researcher wishing to learn *from* the participants how to understand a process or situation (Miles & Huberman, 1994; Morse & Richards, 2002). Allowing the factors of mental toughness to emerge from the data in this way is a major strength of this project.

#### *Participants*

Purposive and snowball sampling techniques were used to select research participants for this project. Purposive sampling involves the researcher targeting participants most closely related to the topic of research – in this case, selection of participants required representative duties for their country as an athlete or in their sport related profession. Snowball sampling involves the researcher gaining additional participants related to the research through the referral of existing participants. In seeking referrals, participants were asked to identify elite athletes whom they would say exhibit mental toughness. These are frequently used qualitative approaches to gathering participants (Miles & Huberman, 1994; Morse & Richards, 2002) as these techniques allow the selection of the best, most optimal examples of the phenomenon, and also ensure that experts in the area of investigation are included in the sample.

The sample comprised a total of 33 participants ranging between 25 and 70 years of age (Mean = 37.68; SD = 13.36). In total there were 21 males and 12 females. The participants include 25 current or former elite athletes (16 and 9 respectively), 15 of them being Gold Medallists or World Champions in their respective sports (8 multiple world champions). The sports represented were: track and field, swimming, boxing, hockey, rowing, archery, basketball, mountain running, mountain climbing, marathon, rugby union, rugby league, Australian rules football, baseball, cricket, cycling, waterpolo, squash, netball, triathlon, power lifting and physically disabled track and field. Of the 25 athletes, six were also currently employed as an elite coach or elite sports management. A further eight participants were non-athletes, who had had extensive elite level sporting experience through their position as sports scientist, coach, psychologist and management.

### *Interview Procedure*

Data were collected using a semi-structured interview schedule, designed to draw out the participants' experience or explanation of mental toughness. Before each interview commenced, the participants were briefed on the study's aims and methods before giving signed consent to participate. An information sheet describing the study and its methods was provided to each of the participants. Participants understood that they could terminate the interview at anytime, or skip any question, and that independent counselling was available if needed.

When rapport had been established, the interviewer began exploring the participant's experience of mental toughness. The duration of each interview ranged between 45 and 90 minutes. The interview was audio taped and transcribed verbatim. These transcripts were used for the data analysis. Finally, participants were asked to suggest names of mentally tough athletes that could be approached for further interviews.

### *Data Analysis*

The data for this research was in the form of qualitative interview transcripts. N-Vivo software (Qualitative Solutions & Research, 1999) was utilised to assist in managing and analysing the data. NVIVO is designed to integrate a number of documents (i.e., interview transcripts) for analysis and index components of text (i.e., interview responses). NVIVO assists the researcher to group their ideas about the data, in a manner that can both harness and generate theory.

### *Coding, Categorising and Abstraction*

The interview transcripts were analysed through a process of coding, categorisation and abstraction. In documenting the coding and categorization process, Constat (1992) suggests researchers outline the components of categorisation and the temporal aspects of category development. The components of categorisation used in this study are origination, verification, and temporal designation.

*Origination* refers to the major influence for categorisation. In this study, origination stems from three sources: (a) Participants: the participants' responses primarily guide category formation; (b) Investigative: the researcher's thoughts and theoretical influences assist in category formation; and (c) Literature: an array of established research findings also provides some influence on category formation. In *verifying* the categories formed in this study, two strategies are employed: (a) Rational: the categories formed have face value and are logically connected the data to the category label; and (b) Referential: category formation is supported by established research findings. *Temporal designation* refers to whether the categories were formed *a priori* or during data analysis. In this study, the majority of categories are formed *a priori*, in that they are based on established research literature. However, a number of categories in this study do not fit predetermined categories, and thus are developed through a combination of the participants' responses and the researcher's interpretations. Taken together, these strategies are the basis upon which the data are interpreted, categorised, and then presented in this chapter to develop a model of mental toughness and the factors that comprise it.

To move beyond the data codes and categories to concepts and theories that help explain the world requires the researcher to employ some level of abstract thinking (Morse & Richards, 2002). Whilst grounded theory describes gaining understanding *from* the data, in practice it is not a passive process. The researcher directs the process, making informed decisions about the data, thinking, linking and abstracting (Morse & Richards, 2002). In interpreting the interviews in this study, the researchers made informed decisions about the data based on abstract thinking about the data in relation to established theory. It is important to recognize that some level of subjectivity is required in the data analysis. Qualitative results reflect the researcher's interpretation, based in part on theories reviewed, but also on the researchers own judgement. Results that arise from qualitative research are not quantitatively derived, nor statistically testable. Rather, they reflect patterns or themes in the data that are derived through the interface of the data collected from respondents and the researcher's analysis of that data.

## **Results and Discussion**

### *Mental Toughness and Adversity*

A dominant finding that emerged when interviewing participants, and also later when reviewing and analysing the interview statements, is that mental toughness seems to exist in the presence of or response to adversity. The types of adversity reported ranged greatly and includes things such as: something going wrong in a competition, high levels of performance pressure, physical pain associated with high level physical effort, competing through an injury, falling behind in a competition, and performing in bad conditions. Whilst the type of adversity can be quite different, the common thread in relation to mental toughness is the notion of overcoming the adversity. Mental toughness exists in relation to overcoming adversity.

In searching for the underpinnings of mental toughness, it is important then to understand each factor of mental toughness in the context of how it assists in overcoming adversity. It is recognised that reactions to adversity will differ

from individual to individual, and the results do suggest that there are a number of ways that athletes interpret and respond to adversity. Notwithstanding this, there are some common features and characteristics associated with mental toughness and what develops below is a list of factors that comprise a proposed mental toughness model.

### *Mental Toughness Characteristics*

Twelve mental toughness characteristics evolved through this qualitative research. These factors include: self-efficacy, mental self-concept, potential, task specific attention, perseverance, task familiarity, personal bests, task value, goal commitment, positivity, stress minimisation, and positive comparisons. Table 1 presents each factor along with definition and a quote that best represents the essence or central theme of the factor. Table 1 also indicates, where appropriate, theories that are useful in interpreting the factors uncovered in this qualitative study. Linking mental toughness with established theory is a major strength of this research.

### *Characteristics Provide Theoretical Building Blocks*

One aim of this research is to go beyond simple description, towards the 'holy grail' of mental toughness theory. Indeed, understanding the theoretical underpinnings of mental toughness shall provide the greatest opportunities for the advancement of this crucial area of research. As outlined earlier, the approach adopted for this investigation is to develop theory grounded in the data. Therefore, in sketching the basic plans for a theory, the first task is to have a good look at the characteristics that have emerged. What do they mean for theory? What follows below is an analysis of the characteristics that emerged within this study, as compared to factors reported elsewhere. These comparisons provide strong evidence from which to select and draw from relevant theories.

Table 2 presents an overview of the mental toughness factors found in this research and elsewhere (namely, Jones, et al, 2002; Fourie & Potgieter, 2001; Loehr, 1986). A comparative discussion between findings on mental toughness is divided into three sections, based upon the sub-scales that are seen as direct parallels, semi-parallels, and sub-scales that are unique factors that have emerged from this study.

### *Factors that Directly Parallel Previous Research Findings*

*Self-Efficacy or Self-Belief.* Self-efficacy as reported in this study, has direct parallels to "Self-belief in ability to achieve competition goals" (Jones et al., 2002), "Self Confidence" (Loehr, 1986), and is quite similar to "Confidence maintenance" (Fourie & Potgieter, 2001). Fourie and Potgieter's (2001) confidence maintenance factor refers to "the ability to reveal competence, self-confidence, and attitude" (pg. 67). The common theme here is that mentally tough athletes require a genuine self-belief in their ability to achieve in their sport.

From a theoretical perspective, theory relating to self-belief is highly significant in understanding mental toughness. Fortunately for this study, the topic of thoughts about oneself has been extensively examined. There is a range of literature available on the overlapping topics of self-confidence, self-efficacy, and self-concept. In reviewing theory, self-concept theory is seen to add the most guidance regarding the characteristics of mental toughness that have emerged. Self-concept research has pointed to the multidimensionality of the self-concept (Marsh and Shavelson, 1985). Indeed, self-concept research suffered a long history of inconsistent findings until a multidimensional view of the concept was adopted. This study, too, suggests that three areas of self-belief are important in mental toughness: self-efficacy (i.e., belief about ability to do); mental self-concept (i.e., beliefs about own mental strength); and potential (i.e., beliefs about the future). Thus, by taking a multidimensional view of self-belief in this study, specificity and greater validity is likely to be the yield of this study.

*Task Focus or Attention Control.* Task specific attention is another factor that has direct parallels across studies of mental toughness. Jones et al., (2002) report the need for: 1) remaining fully focused on the task at hand in the face of competition-specific distractions; 2) remaining fully focused in the face of personal life distractions; and 3) switching a sport focus on and off as required. Additionally, Fourie and Potgieter (2001) reported the need for high cognitive skill, which they define as "the ability to concentrate, focus, think, make decisions and analyse" (pg. 67). Loehr (1986) also included a factor called attention control, which was defined as "the ability to sustain a continuous focus on the task at hand" (pg. 158). Taken together, the research highlights the centrality of task-specific focus or attention on being mentally tough. Mentally tough athletes are able to focus on the execution of the task whilst blocking out or not being adversely affected by "distractions."

There is a large body of research available on attention. Nideffer (1979) developed the notion that as humans we can have different attentional styles: depicted as internal, external, broad, or narrow. Nideffer's theory suggests that each person possesses a unique style of attending to environmental stimuli, and that task performance is a function of the compatibility between the person's attentional style and the attentional demands of the task. The important issue in identifying mentally tough athletes is their level of attentional control at the height of adversity. That is, how well they can shift and/or maintain attention as the situation demands.

### *Factors Sharing Some Parallels with Previous Research Findings*

*Motivation.* The importance of including motivation as a mental toughness characteristic receives overwhelming support. However, the comparison of the range of motivation factors reported in the mental toughness literature highlights that the type of motivation best suited for mental toughness is yet to be confirmed. The general theme that appears to be emerging is that motivations that are internally derived are seen to be of most importance to mental toughness. The current study highlights personal bests and tasks that are personally significant; Jones et al. reports internalised motivation and thriving on competition; Fourie and Potgieter reports determination and commitment; and Loehr reports self-motivation. Taken together, mentally tough responses to adversity are seen to be more likely if the athlete is internally motivated rather than motivated for external or other reasons.

The theoretical offerings of Deci and Ryan (1985; see also Ryan & Deci, 2000) provide a theoretical grounding to understand this internally derived motivation and mental toughness. Their self-determination motivation theory defines intrinsic motivation as a motivation to participate in an activity for the sheer enjoyment it provides to the participant. The individual is motivated to perform for the internal sense of enjoyment that the participation provides. From the results reported here, it is certainly true that motives for mental toughness are internally derived (i.e., personal bests and task value). Theory relating to internal motivations is relevant in the development of mental toughness theory.

*Mental Self-Concept.* The current study reports that mentally tough athletes see themselves as “mentally strong – stronger than their opponents”. It is also reported that mentally tough athletes perceive that they cope better than their opponents do in tough situations (Positive Comparison). These two factors are somewhat similar to Jones et al’s (2002) factor, “having an unshakeable self-belief that you possess unique qualities and abilities that make you better than your opponents.” Mentally tough athletes have positive perceptions of themselves relative to their opponents. They believe they are mentally stronger, and when faced with difficulty, they believe they handle it better than others do.

The self-concept of elite athletes has been defined by Marsh, Hey, Johnson, and Perry (1997). In their description of the elite athlete self-concept, they include six components, namely self-perceptions about the suitability of their: skills, body, aerobic system, anaerobic system, mental capacity, and overall ability to perform. A closer look at the mental capacity factor reveals that it is in fact very similar to the mental self-concept uncovered in this investigation. Thus, the literature and theory relating to the self-concepts of elite athletes, and particularly the mental capacity self-concept, provides a quality source of guidance in the development of mental toughness theory.

*Coping Skills.* Fourie and Potgieter (2001) draw attention to the importance of effective coping with their factor “Coping Skills.” They define coping skills as “the ability of the athlete to reveal his/her coping ability, demonstrate composure, acceptance, activation control and adaptability” (pg. 67). Whilst the definition captures a range of coping elements, the authors draw these elements together under one factor. The current study differs in that it separates the elements of coping and represents them as distinct factors (e.g., positivity, minimization and positive comparison). Jones et al., (2002) present one clear coping factor, “Accepting that competition anxiety is inevitable and knowing that you can cope with it.” However, in addition to the obvious coping factors, other factors such as perseverance, increased motivation, and task focus are all considered as ways of coping as they are ways in which athletes cope with adversity (i.e., countering adversity with increased attention, perseverance and motivation). Even Loehr’s (1986) seven factors include factors pertaining to the ability to cope, such as attention control, attitude control, and positive and negative energy. In summing the various research findings together, effective coping (both emotion and problem-focussed coping) is a necessity of mental toughness. The current study reports specific ways that mentally tough athletes cope.

Lazarus and Folkman (1984) provide a widely accepted theoretical perspective on coping. Their work separates styles of coping into both emotion and problem-focussed coping. Emotion-focussed coping serves primarily to ease emotional discomfort associated with adversity, whilst problem-focussed coping serves primarily to increase efforts at overcoming adversity. Mental toughness seems to draw on both styles of coping. Characteristics such as stress minimisation, positivity, and positive comparisons are forms of emotion-focussed coping. On the other hand, task specific attention, perseverance, and personal bests are all examples of problem-focussed coping. What is clear, then, is that mental toughness theory should consider the dual styles of coping in understanding how athletes cope with adversity.

### *A Unique Characteristic of Mental Toughness that Emerged from this Investigation*

*Task Familiarity (experience).* The role of athletes being familiar with their sport and the adversities that go with sport, and the role of experience in general, was strongly supported by the participants of this study. For this reason, it is of some surprise that the role of familiarity and experience has to date been neglected in conceptualisations of mental toughness. In any case, athletes and coaches believe that with increased experience comes increased mental toughness. One would assume, then, that familiarity reduces negative affect related to performance, thus increasing mental toughness. Athletes reported that specific events (e.g., Olympics) and specific adversities (e.g., injury) become easier to deal with the second time around. It is acknowledged here that experience can also bring about reductions in mental toughness, particularly negative experiences during vulnerable times that adversely impact on the athlete’s self-belief. More immediately relevant,

however, is that familiarity be considered as a factor of mental toughness in the model development, and is a significant addition to the research field.

### *Integrating the Predictors into a Multidimensional Structure*

One aim of this investigation was to move beyond description towards a conceptual model of mental toughness. Supporting a multidimensional model of mental toughness, one participant reports,

I sort of see it a bit like a pyramid I guess, with mental toughness being the final outcome sitting at the top of the pyramid and at the base a number of quite broad platform factors if you like, and then skills being built upon those to the extent that the outcome at the end of the day is an athlete that's mentally tough under pressure.

Here the participant describes a series of "broad platform factors" from which mental toughness originates. This multidimensional view of mental toughness is also supported by the research of Jones et al., (2002) and Fourie and Potgieter (2001), and Loehr's (1986) heuristically appealing, although empirically unsubstantiated model of mental toughness. Taken together, mental toughness should, at a minimum, be considered to be a multidimensional construct.

The components underpinning mental toughness provide a basis for a model of mental toughness that reflects the complexity of the concept. Figure 1 displays a visual representation of the model that was developed as a component of this study. This model divides mental toughness factors into Mental Toughness Strategy and Mental Toughness Orientation. This model is a preliminary representation of mental toughness as guided by the qualitative study and requires further quantitative testing to validate and perhaps refine it.

The separation of mental toughness into 'orientation' and 'strategy' components was derived from two observations. Firstly, participants choose to describe mental toughness from these two perspectives. That is, participants described mental toughness as the things they saw others or themselves doing when they were being mentally tough (i.e., focused, perseverant and coping well), but also by the things they felt influenced someone's orientation to be mentally tough (i.e., self-belief, experience and motivation orientations). The second observation was that when each of the factors was considered for their content, it became clear that there were factors that were actions (i.e., coping strategies, persevering behaviour and focusing of attention) and there were factors that were personal characteristics (i.e., self-beliefs, motivations and familiarity).

Additional component groupings were made within each of the orientation and strategy sides of the model. The coping strategies were grouped under one factor labelled "Emotion Management." Likewise, grouping the beliefs one has about oneself under a factor labelled "Self-Belief"; and grouping the motivation-based factors under a factor labelled "Motivation" make further subdivisions. Therefore, what has been developed is a model of mental toughness that is multidimensional, but also hierarchical. This multidimensional and hierarchical model is a similar structure to that utilized successfully by Shavelson et al. (1976) to substantially progress self-concept research. Like Shavelson et al's research, the strength of conceptualizing mental toughness as multidimensional and hierarchical is in the way this type of model captures with greater specificity the complexity of the concept.

The model of mental toughness presented here is a *description* rather than a *prescription*. The factors were derived via participant description, and the model integrates these descriptions into an overall depiction of mental toughness. This research does not prescribe a set way to be mentally tough. Athletes do not necessarily require all of these factors to be considered mentally tough. Instead, it is hypothesized that athletes can be mentally tough using different combinations of these factors presented in the model. It is most likely, however, that there will be a core group of factors that are essential for mental toughness. Determining the level of contribution each component provides to overall mental toughness remains an important future investigation.

### *Mental Toughness Definition*

Now that mental toughness has been closely examined and is better understood, the development of a preliminary definition of mental toughness is now possible. This definition may be confirmed or further refined in the process of future quantitative study.

The preliminary definition is as follows:

*Mental toughness is defined as an unshakeable perseverance and conviction towards some goal despite pressure or adversity.* Moreover, attaining mental toughness as so defined requires the presence of some or all of the twelve mental toughness components.

The strength of this definition is that it does not limit itself to what may be seen as the outcomes of mental toughness. One drawback that has been levelled at others who have attempted to define mental toughness, is the tendency to confuse what mental toughness allows one to do with what it actually is (e.g., Jones et al., 2002). The definition presented here, however, looks not only at what mental toughness is but also includes the actions of mental toughness (i.e., emotion management, perseverance, and task focus), and also the role of some of the factors that orient an individual to be mentally tough (i.e., self-belief, determination, commitment, attitude, and task familiarity).

### *The Yields of this Study*

The model of mental toughness presented in this research provides an appealing way of considering mental toughness. The model has strengths for both theory development and in application. For theory, the model draws together a series of hypothesized interrelationships between the factors of mental toughness and represents these in a multidimensional and hierarchical model, in many ways similar to the approach adopted by Shavelson et al. (1985) in progressing self-concept research. Further quantitative research is needed to provide support for this multidimensional and hierarchical model.

This research provides preliminary support for examining the role of adversity in mental toughness. Mental toughness may be significantly influenced by the interaction between the factors within the individual and the stressor or environmental characteristics. The interaction between mental toughness characteristics and factors within the stressor or environment remain a significant direction for future investigation.

The model also has strengths for the applied setting. Firstly, by drawing together a set of more complex constructs, the model provides a parsimonious way of considering mental toughness. Whilst the model integrates a complex set of theories, it still provides an easy way for athletes to think about their mental toughness and for coaches and others to explain it to them. The model also holds applied benefits in the area of measurement and training. Firstly, the development of a model, however preliminary, draws the field closer to effective measurement of mental toughness. Secondly, once effective measurement is possible, insights into the success and nature of interventions for developing and then sustaining mental toughness are enhanced.

Overall, the present study advances our understanding of the concept by presenting a more fine-grained view of the components of mental toughness. This was, in part, achieved through methodological changes employed by the researchers. In Fourie and Potgeiter's (2001) study, the qualitative study employed the use of open-ended written response format. This method has its limitations in that participants' comments cannot be probed for further expansion and development. Jones et al (2002) utilised individual (n=10) and group interviews. While this method of data collection was an advancement, the data interpretation lacked any detailed analysis. Instead, the authors adopted a presentation style that was a description of what was said, without any theoretical development. The present study provides an important development on the former two studies in that it extends the method and results to utilise more complex and fine-grained data collection, data analysis, and presentation methods. The present study utilised in-depth qualitative interviews (n=33) of world-class athletes and coaches, presented a descriptive view of what emerged from the interviews, and then developed these ideas into a multidimensional and hierarchical mental toughness model and supported by theory.

### **Conclusion**

This paper provides what has been desperately lacking in the area of mental toughness – definition and conceptualisation. The scientific rigour employed by this study ensures that our understanding of mental toughness is sound. With an understanding of mental toughness firmly in hand, investigations of measurement, development across a lifespan, and training methods are now viable. To truly understand how mental toughness unfolds in people's lives, future research would do well to investigate the *interaction* between personal characteristics (i.e., the twelve mental toughness factors identified here), social support and the nature of the pressure or adversity.

### **About the Authors**

Mr Cory Middleton is a registered psychologist, with a particular interest in understanding and developing mental toughness. He is the PhD candidate working on the Mental Toughness Research Project through the SELF Research Centre, University of Western Sydney.

Professor Herb W. Marsh is a professor of Educational Psychology, founding Director of the Self-concept Enhancement and Learning Facilitation (SELF) Research Centre, and served as Dean of Graduate Research Studies (1996-2000) and Pro-Vice Chancellor of Research (1995-96) at UWS. He is the author of internationally recognised psychological tests that measure self-concept, motivation, an university students' evaluations of teaching effectiveness. He is well known in sports psychology for the development of the physical self-concept instruments for elite athletes (Elite Athlete Self Description Questionnaire) and non-elite athletes (Physical Self Description Questionnaire) and methodological contributions to the field.

Dr Andrew Martin is a Post-Doctoral Research Fellow at the SELF Research Centre, University of Western Sydney. He specialises in student motivation with an emphasis on strategies educators can use to enhance student motivation in the classroom. Dr Martin also has a keen interest in research methodology with particular strengths in survey design and structural equation modelling.

Mr Garry Richards OAM, completed undergraduate degrees at the University of Sydney and his further post graduate studies have been through the Australian National University, James Cook University and Sturt University. He was formally Executive Director of Outward Bound, National Chairman of ORCA, and Executive Director of National Outdoor Education and Leadership Services, a national consultancy and research company.

Mr Clark Perry has a long history of working in elite sport in both the US and Australia. His appointments to four Olympic Games, three Commonwealth Games and multiple world championships demonstrate the respect that he has earned in the field of sport psychology.

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This paper has been formally referred according to DEST requirements.

Table 1. Mental Toughness factors, definitions, and quotes

Factor	Definition	Representative Quote	Research Domain
<b>Self-Efficacy</b>	The athlete's judgment or belief in his or her own ability to succeed in reaching a specific goal	You believe in your heart that you can go and do it...I was just following my heart, believing in myself that I could do it and come back.	Self-Efficacy
<b>Mental Self-Concept</b>	Viewing one's self as being mentally strong in relation to dealing with adversity	I have the attitude that mentally I am superior, mentally I am stronger and mentally I am capable of hanging in there for a longer	Athlete Self-Concept
<b>Potential</b>	Believing that you have the inherent ability or capacity for growth, development or coming into being	The driving thing for me at the moment is the fact that I haven't achieved everything I think I'm capable of, and I still think I can	Future Self-Concept
<b>Task Specific Attention</b>	The unshakeable concentration of mental processes on a task whilst excluding other distractions from concentration	The ability to remain focused in extreme situations... you're constantly trying to redirect your focus back into what you are doing that moment	Attention
<b>Perseverance</b>	Persisting in or remaining constant to a purpose, idea, or task in the face of obstacles, discouragement or adversity	When all hell's breaking loose around you, you just keep going... you just knuckle down to what you're doing and you just keep grinding away	
<b>Task Familiarity</b>	Having a good understanding and being well acquainted with the task or adversity	Being familiar with your environment and with the competition just makes you relaxed	
<b>Personal Bests</b>	An internal motivation or drive to pursue personal best performances	I enjoy exploring my physical and mental limits... seeing how much pain and adversity I can overcome... seeing what my best is	Task oriented; internal motivation
<b>Task Value</b>	The quality of importance or the significance the successful completion of the task holds for the individual	The value of what you're going after is very critical. How significant is that to you? If it's not important, why would you put yourself through it	
<b>Goal Commitment</b>	The act of binding oneself (intellectually and emotionally) to a goal or a course of action	There was no way I would ever have given up after making that commitment to myself. I had to follow it through, no matter what, just for me	
<b>Positivity</b>	The process of being positive and remaining positive in the face of adversity or challenge	I always try to see the positive, no matter what I'm faced with	Positive Self-Talk; Coping
<b>Stress Minimisation</b>	The process of reducing ones emotional reaction to adversity	I think he can see and dismiss small failures for what they are, where the others get focused on small failures and blow them out of proportion	Coping
<b>Positive Comparisons</b>	Sensing that you're coping better with adversity and thus have a psychological and competitive advantage over you opponent	I remember looking across at her and I could see her eyes widening and I thought, - she's shitting herself. So I kept going	Coping

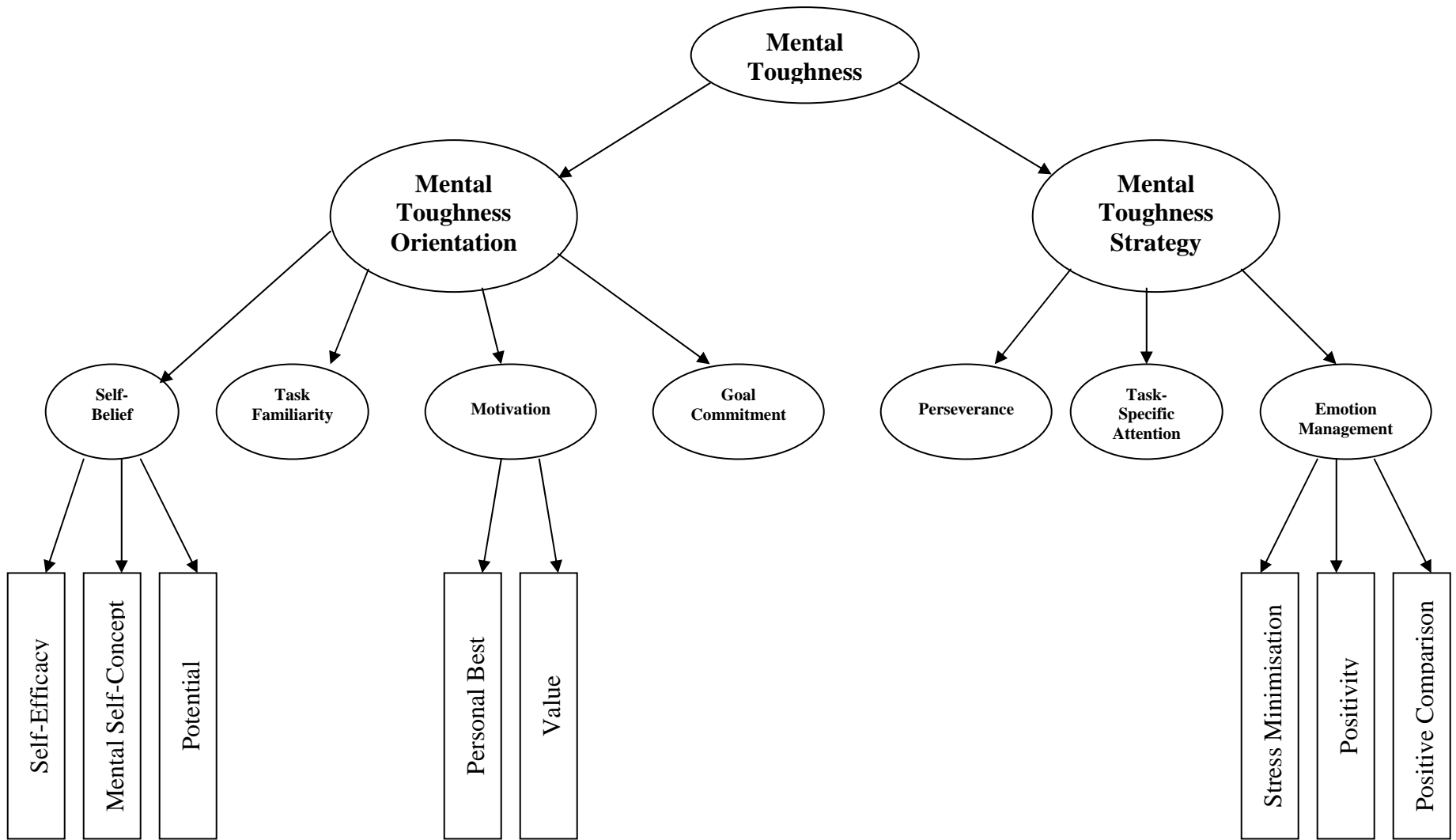


Figure 1. Structure of the proposed model of mental toughness

*Table 2. Overview of Subscales/Skills Identified in Mental Toughness Research*

<b>The present study</b>	<b>Jones, Hanton, &amp; Connaughton (2002)</b>	<b>Fourie &amp; Potgieter (2001)</b>	<b>Loehr (1986)</b>
Self-Efficacy	Having an unshakeable self-belief in your ability to achieve your competition goals	Motivation level	Self Confidence
Mental Self-Concept	Having an unshakeable self-belief that you possess unique qualities and abilities that make you better than your opponents	Coping Skills	Negative Energy
Potential	Having an insatiable desire and internalised motives to succeed	Confidence maintenance	Attention Control
Personal Best (motivation)	Bouncing back from performance set-backs as a result of increased determination to succeed	Cognitive skill	Visual & Imagery Control
Value (or importance)	Thriving on the pressure of competition	Discipline and goal-directedness	Motivation level
Task Familiarity	Accepting that competition anxiety is inevitable and knowing that you can cope with it	Competitiveness	Positive Energy
Goal Commitment	Not being adversely affected by others' good and bad performances	Possession of prerequisite physical and mental requirements	Attitude Control
Perseverance	Remaining fully focussed in the face of personal life distractions	Team unity	
Task Specific Attention	Switching a sport focus on and off as required	Preparation skills	
Stress Minimisation	Remaining fully focussed on the task at hand in the face of competition-specific distractions	Psychological hardiness	
Positivity	Pushing back the boundaries of physical and emotional pain, while still maintaining technique and effort under distress (in training and competition)	Religious convictions	
Positive Comparison	Regaining psychological control following unexpected, uncontrollable events (competition-specific)	Ethics	