Routledge Handbook of Applied Sport Psychology
A comprehensive guide for students and practitioners
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Mental toughness

Publication details
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Published online on: 13 Oct 2010

How to cite: Daniel F. Gucciardi, Clifford J. Mallett. 13 Oct 2010, Mental toughness from: Routledge Handbook of Applied Sport Psychology, A comprehensive guide for students and practitioners Routledge
Accessed on: 20 Jul 2023
Researchers and practitioners have long considered psychological factors as essential ingredients for performance excellence and well-being across a number of settings. Athletes and coaches commonly describe an athlete’s “mental game” as one of the key distinctions between good and great athletes. Mental toughness is the umbrella term that coaches, athletes, sport psychologists, and the media use when referring to the constellation of psychological factors that appear to discriminate good and great athletes. Although once considered a little-understood construct, the knowledge base contributing to current conceptualizations of mental toughness now has some scientific rigor owing to the efforts of several groups of researchers. Researchers have studied the perceptions of athletes and coaches from a variety of team (e.g., rugby union, netball, football) and individual sports (e.g., swimming, triathlon, boxing) in an attempt to identify the make-up of mentally tough performers. Recent investigations have adopted a context-specific approach in which mental toughness is examined within a single sport (e.g., cricket, soccer) to provide a context-rich understanding of this construct (for a review, see Gucciardi, Gordon, & Dimmock, 2009a).

Core components of mental toughness

Perhaps the most common finding from the available empirical literature is that mental toughness appears to be multifaceted with multiple key components. These key components can be broadly classified as values, attitudes, cognitions, and emotions. Among these broad components, there seem to be several central characteristics (e.g., self-belief/confidence, personal values, attentional control, self-motivation, positive and tough attitudes, enjoyment and thriving through pressure, resilience, sport intelligence) that are common across all the sports sampled thus far, suggesting that this constellation of core psychological characteristics would not vary significantly by sport. The cohorts sampled in the investigations to date, however, are certainly not representative of most sport participants. There are some variances in key characteristics that seem to provide sport-specific information.
(e.g., team unity, ability to react quickly) suggesting that mental toughness may be somewhat contextually bound.

Defining mental toughness

Gucciardi and colleagues (2009a) recently defined mental toughness as

a collection of experientially developed and inherent sport-specific and sport-general values, attitudes, emotions, and cognitions that influence the way in which an individual approaches, responds to, and appraises both negatively and positively construed pressure, challenge, and adversity to consistently achieve his or her goals.

(Loehr, 1986)

Unlike previous definitions of mental toughness (e.g., Clough, Earle, & Sewell, 2002), which focus specifically on the end-state of being mentally tough, Gucciardi et al.’s definition captures the holistic nature of mental toughness. Specifically, the definition highlights the multidimensional nature of mental toughness, its usefulness for dealing with and thriving through both positively and negatively construed situations, and the processes by which mental toughness operates. The notion that mental toughness is useful in dealing with and thriving through both positively (e.g., winning streak, individual good form) and negatively (e.g., injury, individual poor form) construed situations on and off the field provides an important conceptual distinction from the related resilience construct. Unlike resilience, which is largely about withstanding, recovering, and adapting from adversity or risk (i.e., situations known to be associated with negative outcomes; Rutter, 2006), mental toughness encapsulates one’s ability to deal with and thrive through pressure, challenge, and adversity when things are going well in addition to when things are going poorly (Gucciardi et al., 2009a). One criticism that can be made of the Gucciardi et al. definition is that it implies that goal achievement is a necessary component of mental toughness. Some may consider individuals who do not consistently reach their goals but maintain unswerving motivation and drive in the face of regular suboptimal performances as mentally tough.

Measuring mental toughness

The lack of a clear conceptualization and operational definition of mental toughness has meant that there have been few attempts to develop inventories that profile and assess mental toughness in sport. Loehr’s (1986) Psychological Performance Inventory (PPI) has been the most influential and widely employed inventory for measuring mental toughness in both applied and research settings. The PPI measures what Loehr claimed to be the seven most essential ingredients of mental toughness: self-confidence, attention control, negative energy, motivation, attitude control, positive energy, and visual and imagery control. Nevertheless, Loehr offered no psychometric support for its use and subsequent research has questioned the psychometric structure, reliability, and validity of the PPI (e.g., Middleton et al., 2004).

Based on their 4Cs model of mental toughness consisting of three elements of the dispositional construct of hardiness (commitment, control, and challenge: Kobasa, 1979) and confidence, Clough et al. (2002) constructed a 48-item questionnaire referred to as the MT48.
Clough et al. reported that the MT48 has excellent test-retest reliability (0.90), adequate internal reliability (α = 0.71 to 0.80), and can distinguish participants reporting high and low MT48 scores in terms of exertion ratings during a 30-minute cycle ride. Nevertheless, Clough et al.’s account of the research process was brief and did not provide details regarding the methodologies employed to develop their model and associated inventory. Such brevity does not convey the extent to which the methodologies employed demonstrate rigor, reliability, and validity. Moreover, Clough et al. have not demonstrated that their measure of mental toughness, and therefore their 4Cs model, can be differentiated from psychometrically sound hardiness measures (e.g., Personal Views Survey III; Maddi & Khoshaba, 2001), thereby adding to the conceptual confusion that exists between mental toughness and resilience or hardiness.

Mental toughness appears to consist of both sport-general and sport-specific components. Researchers have recently demonstrated the usefulness of sport-specific inventories in measuring mental toughness in Australian football (Australian Football Mental Toughness Inventory: Gucciardi, Gordon, & Dimmock, 2009b). Nevertheless, it is important to recognize that triangulation assessment procedures will provide a more reliable indicator of mental toughness, because single-case inventory assessment procedures remain open to potential bias. Obtaining multiple sources of information on athletes’ mental toughness from their coaches, and parents, or teammates (cf. Gucciardi et al., 2009b) affords a means by which to triangulate data in the absence of, for example, behaviorally-based assessments or implicit measures of mental toughness. An evaluation tool that includes observable and measurable behaviors considered indicative of mental toughness has yet to be developed and to date only Gucciardi et al. have generated a preliminary conception of mentally tough behaviors. An understanding of the situations where the components of mental toughness are considered useful (cf. Gucciardi & Gordon, 2009) will facilitate coaches’ and practitioners’ endeavors in developing context-specific behavioral checklists for mental toughness.

**Mental toughness within the framework of positive psychology**

Seligman and Csikszentmihalyi (2000) suggested three missions of the psychology profession: (a) treating mental illness, (b) making people stronger and more productive, and (c) actualizing human potential. Consistent with the field of positive psychology, the development of mental toughness is concerned mostly with the latter two missions of psychologists. Positive psychology foregrounds the development of competencies or qualities that enable humans to flourish. Development of the personal traits associated with mental toughness (e.g., optimism, hope, courage, perseverance, self-determination) is consistent with the strengths-based approach of positive psychology. A strengths-based approach promotes quality of life by developing positive individual characteristics that act as buffers against unhelpful reactions to positive and negative life events (Seligman & Csikszentmihalyi, 2000).

The challenge for practitioners is how to foster these positive human qualities in others. Recent organismic theories such as self-determination theory (SDT; Deci & Ryan, 1985) view humans as active organisms who are adaptive and volitional, and who initiate behaviors to satisfy their innate psychological needs and physiological drives. These theories underscore the importance of the social-contextual environment (e.g., coach–athlete–performance relationship) in nurturing the satisfaction of the psychological needs of humans, which leads to growth and actualization of human potential (Deci & Ryan, 1985). Those empowered...
to influence others can nurture positive individual traits or qualities that promote human flourishing.

**Developing mental toughness: the practitioner’s role**

Facilitating the development of mental toughness beyond that which occurs naturally through normal development involves the interaction of both environmental and intra-personal issues (e.g., coach-training and athlete-centered programs). Key individuals in the socialization network such as parents, siblings, coaches, and teammates play pivotal roles in fostering home, school, and sporting environments that encourage the development and maintenance of those values, attitudes, emotions, and cognitions encompassing mental toughness. Nevertheless, the optimal learning and motivational environment in the early years of individuals’ development in sport is not necessarily the same as the optimal learning and motivational activities in later years (Côté & Fraser-Thomas, 2007). For example, practitioners working with youth athletes might focus on working with coaches and parents, with the focus on psychological skills training for experienced athletes.

**Critical incidents: opportunities for growth**

Previous research has highlighted the importance of perceived critical incidents (e.g., disruptions at school) that occur throughout individuals’ development as playing important roles in cultivating mental toughness (Coulter, 2008). Both positive and negative incidents occurring within and outside of sport settings provide important means by which to facilitate mental toughness. It is not so much what happens to athletes (in and out of sport) but how they interpret what happens, including the causes of those events. Athletes will experience a range of life events – pleasant and unpleasant. The key to developing mental toughness is learning to adaptively respond to these critical incidents or opportunities for growth. Athletes should be encouraged to view challenges or critical incidents as opportunities for growth. For example, non-selection in a representative team could be viewed as fueling the “hunger” of athletes to work harder to improve performance.

The process of reflection is an important tool for empowering individuals to view life experiences in adaptive ways. Using reflective practices, performers can become internally motivated by perceptions of being in control and can influence their future behavior/performance (Ryan & Deci, 2000). Guided reflection by practitioners and coaches is considered important in promoting adaptive responses to critical incidents (Mallett, 2004).

Reflection-on-action is the analysis, synthesis, and evaluation of information post-performance (Schön, 1983). Reflective journals and training diaries to record post-performance evaluation/reflection are useful means of developing the ability to self-reflect (Mallett, 2004). The ability to self-reflect requires structured guidance (e.g., constructive feedback) from psychologists and coaches as well as regular practice. Communication strategies that promote reflection-on-action involve messages that encourage individuals to engage in processing why and how an action emerges from, and serves to create, the affective and psychological environment (Applegate, Burke, Burleson, Delia, & Kline, 1985). Research shows that reflection-on-action that enhances communication can facilitate the development of individuals’ social-cognitive and functional communication skills and promote the development of advanced thought processes and behaviors such as perspective-taking, reasoning, and logic (Applegate et al., 1985). Mental toughness can be promoted through
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guided reflection-on-action. For example, practitioners may facilitate conversations with athletes about mental toughness in their sports, perhaps with a focus on specific behaviors and cognitions (Coulter, 2008). Sport psychologists can promote athletes’ abilities to explore alternative ways of construing critical incidents that foster mental toughness and personal growth. For example, athletes can reflect on conversations about cognitions associated with particular situations that require mental toughness (e.g., positive self-talk).

**Coach-mediated learning environment**

Social-contextual conditions can foster personal growth and actualization (Deci & Ryan, 1985) through socialization; that is, adopting certain attitudes, beliefs, and values from significant role models (e.g., parents, siblings, coaches, teachers). Coaches can design adaptive learning conditions that promote human growth. Creating a coach–athlete–performance environment for developing mental toughness can be the responsibility of the coach. Sport psychologists can play a pivotal role in guiding coaches in how they might develop these qualities in their athletes. They can work indirectly through the coach and/or directly with the athletes in developing a range of psychological skills aimed at developing these mental toughness qualities. Developing mental toughness is central to athletes enjoying their sporting experiences and learning to get the best out of themselves. The role of significant others in developing positive psychological qualities has been frequently reported (e.g., Côté & Fraser-Thomas, 2007). Furthermore, research on mental toughness supports the view that this psychological construct can be developed (e.g., Coulter, 2008).

Although coaches may play a less important role than parents in facilitating athletes’ mental toughness, research has shown they can be influential. For example, in Coulter’s (2008) qualitative study on elite football (i.e., soccer) players in Australia, coaches were reported as helping players in their formative playing years to develop tough attitudes such as valuing hard work, patience, and sacrifice (considered necessary to be successful players) through the in situ teaching of mental skills to cope with anxiety and pressure, and the ability to focus on the task at hand. Furthermore, coaches were found to promote self-belief and acknowledge when players were mentally tough. Coaches are responsible for designing adaptive learning environments that facilitate athletes’ mental toughness; however, coaches may not have the knowledge or skills to develop athletes’ mental toughness. Therefore, sport psychologists can assist coaches in understanding the concept of mental toughness and its development within the sporting environment. Furthermore, sport psychologists can support coaches in designing optimal learning environments as well as provide feedback to coaches about how their coaching behaviors can facilitate or thwart mental toughness. As architects of the learning environment, coaches’ behaviors will influence the thoughts, feelings, and behaviors of the athletes they coach (Mallett, 2005).

An autonomy-supportive approach to coaching, based on SDT (Deci & Ryan, 1985), is consistent with two key missions of positive psychology: (a) making people stronger and more productive, and (b) actualizing human potential (Seligman & Csikszentmihalyi, 2000). Increasing internal (self-determined) motivation promotes a sense of personal control and associated positive outcomes in the way athletes think, feel, and act (Mageau & Vallerand, 2003).

Mallett (2005) used an autonomy-supportive approach to coaching Australian Olympic relay teams, consistent with the suite of autonomy-supportive pedagogical behaviors identified by Mageau and Vallerand (2003). He sought to develop positive psychological qualities such as those identified in research on mental toughness (e.g., self-belief, autonomy,
internal motivation, courage, pursuit of excellence). Essentially, the autonomy-supportive approach to coaching shifted responsibility for learning to his athletes to promote self-determination, personal ownership, and intelligent performance (e.g., remaining calm and problem-solving under pressure). He used guided discovery and problem-solving approaches to instruction that featured divergent and convergent questioning. The following autonomy-supportive behaviors characterized his approach to coaching:

- offering choices (within boundaries) – for example in the design of some content for training sessions;
- allowing athletes to work independently and interdependently with input into solutions for solving problems associated with performance;
- supplying rationales for coaching decisions – why is the task important?
- involving athletes in discussions to seek their opinions on improving performance (e.g., race tactics); and
- providing competence (informational) feedback – non-controlling feedback (including self and peer feedback) that focused on what was good, what can be better, and how they can improve.

Extensive research using SDT strongly supports the adoption of an autonomy-supportive approach to coaching (Mageau & Vallerand, 2003) because it can create an adaptive motivational climate which, in turn, can provide positive outcomes in terms of performance, persistence, effort, and levels of concentration (see Mageau & Vallerand, for a review). We argue that focusing on athletes’ strengths and promoting ownership and control of their performances sends a message of competence to athletes, and encourages autonomy.

Finally, coaches’ abilities to model mental toughness can be influential in developing athletes’ mental toughness. Learning from modeling the behaviors of significant others is not uncommon. For example, athletes are likely to model coaches’ behaviors that demonstrate confidence, calmness under pressure, courage, diligence, and positive but tough attitudes such as valuing hard work, patience, and sacrifice, and resilience. How coaches respond to critical incidents in athletes’ performances (e.g., missing both free throws in the final seconds of a basketball match, which the team loses) can either facilitate or thwart the development of mental toughness. Moreover, the decisions coaches make can send undesirable messages to athletes. For example, coaches should promote and demonstrate appropriate risk-taking in sport rather than potentially modeling “a fear of failure” (e.g., defending a lead). Practitioners can support the coach–athlete–performance relationship by working directly with coaches in designing adaptive learning environments that facilitate the development of mental toughness qualities.

Psychological skills training for athletes

The question remains, however, what happens if individuals have not been exposed to such facilitative environments during their formative and junior sporting years? Can extra efforts make up for the absence of these experiences? Aside from natural learning experiences, critical incidents, and coach-mediated learning environments, psychological skills training (PST) programs focusing on either single psychological skills or multimodal packages integrating more than one psychological skill or technique afford one method by which practitioners can attempt to make up for limited facilitative developmental experiences. The aims of PST programs are to educate and equip athletes with techniques and strategies
that can be used to assess, monitor, and adjust their thoughts and feelings to produce psychological states that both facilitate performance and foster positive personality characteristics through psycho-educational workshops and activities (Vealey, 2007). Both single psychological skill and multimodal packages have been shown to be effective in enhancing psychological and life skills associated with mental toughness as well as facilitating athletic performance and promoting personal development (for a review, see Vealey). Several chapters in this handbook refer to psychological skills and techniques pertinent to mental toughness in sport such as arousal control (Chapter 49), imagery (Chapter 50), goal setting (Chapter 51), concentration and attention (Chapter 52), self-talk (Chapter 53), self-confidence (Chapter 54), time-management (Chapter 55), and pre-performance/pre-competition routines (Chapter 56).

Recent research provides support for the premise of offering PST packages by demonstrating the effectiveness of two multimodal packages in enhancing mental toughness among youth-aged Australian footballers (Gucciardi, Gordon, & Dimmock, 2009c). The first package consisted of six psychological skills commonly employed in PST programs (self-regulation, arousal regulation, mental rehearsal, attentional control, self-efficacy, and ideal performance state). In contrast, the second targeted the keys to mental toughness in Australian football (self-belief, work ethic, personal values, self-motivation, tough attitude, concentration and focus, resilience, handling pressure, emotional intelligence, sport intelligence, and physical toughness) identified by Gucciardi, Gordon, and Dimmock (2008). Box 57.1 provides examples of some of the methods employed within the two intervention programs. Overall, the results showed that participation in both programs resulted in improvements in self-reported mental toughness, dispositional resilience, and flow. Parents and coaches also reported similar improvements in footballers’ mental toughness. Both PST packages appeared to be as effective as each other in enhancing mental toughness. Predictably, a control group receiving no psychological intervention did not show significant changes in mental toughness, resilience, or flow. Caution is urged when interpreting the findings from Gucciardi et al.’s (2009c) intervention research, because the improvements in perceived reports of mental toughness, resilience, and flow were changes in scores on inventories and were not linked with measurable and observable behavioral outcomes reflecting key performance indicators in Australian football.

Program evaluation

Aside from the Australian Football Mental Toughness Inventory (Gucciardi et al., 2009b), no other psychometrically sound measure of mental toughness currently exists. Until such a measure is developed, the revised performance profile technique (Gucciardi & Gordon, 2009) affords one method by which practitioners and coaches can evaluate the effectiveness of an endeavor designed to facilitate or enhance the development of mental toughness. The performance profile is a client-centered assessment procedure that charges athletes with an active role in determining the psychological skills or qualities that are important for performance in their sports and thus warrant assessment. Performance profiling is in direct contrast to traditional psychometric assessment procedures in which the practitioner imposes the important skills or qualities upon athletes. After generating a list of those qualities or skills athletes believe are fundamental to performing at the elite level in their sports or performing to the best of their abilities, athletes then provide an assessment of their current selves on each of the identified qualities. Although the performance profile technique is commonly employed to elicit attributes that constitute the fundamental
qualities of an elite performer in one's sport, Gucciardi and Gordon provided an example of how the performance profile can be used to explore and examine changes in mental toughness with an Australian footballer. In addition to presenting practitioners with a useful tool for monitoring and evaluating performance, the performance profile enhances self-awareness, intrinsic motivation, self-confidence, and team communication, and can be used as a basis for goal setting.

**Conclusion**

Recent advancements in mental toughness research have provided evidence for the conceptualization of mental toughness as a multidimensional construct made up of sport-general and sport-specific components derived largely from experience but involving some genetic components. Key mental toughness components influence the way individuals approach, respond to, and appraise both positively and negatively construed situations involving varying degrees of pressure, challenge, and adversity. Understanding and learning from critical incidents, developing coach-mediated learning environments, and training in psychological skills affords practitioners and coaches opportunities by which to facilitate the development of mental toughness beyond that which occurs through natural development. The performance profile represents a simple and flexible method to assess mental toughness and the effectiveness of interventions designed to develop or enhance this desirable construct, until a measure is developed.

One could conclude that mental toughness has only optimal outcomes for athletes; however, it is important to note there is no research to date that has provided a link between mental toughness and observable and measurable performance outcomes. Until such evidence is presented we can only speculate as to the potential that mental toughness may have for subsequent performances. Little attention has been given to potentially dysfunctional outcomes not only for performance but also for general well-being. For example, some components of mental toughness such as tough attitudes and physical toughness may cause athletes to push themselves beyond their physical limits during rehabilitation exercises in an attempt to speed up the rehabilitation process thereby (negatively) affecting their injuries. It may also be that optimistic tendencies influence mentally tough athletes to appraise their injuries to be less severe and, in turn, place little importance on complying with their rehabilitation programs. Subsequently, mentally tough athletes may be more prone to playing while injured. An internalized desire to achieve success and an attitude to “never accept mediocrity” combined with an insatiable work ethic may also place mentally tough athletes at greater risk of overtraining. In addition to the physical and psychological effects of overtraining, personal relationships with loved ones such as partners, parents, and children may be affected by the desire to do whatever it takes to succeed in sport. Nevertheless, further research is needed regarding this potential “dark side” of mental toughness.

Finally, there is still some debate regarding the most appropriate definition and conceptualization of mental toughness. Given that mental toughness research and theory are still in their infancies, we envisage that the coming years will produce conceptual clarity stemming from quality investigations. In the meantime, practitioners and coaches can draw on the available research described in this chapter and summarized in Box 57.1 to engage athletes and coaches in developing and facilitating this thing called mental toughness.
Box 57.1

Take-home messages about mental toughness for practitioners and coaches

- Key components are made up of a collection of sport-general and sport-specific values, attitudes, emotions, and cognitions.
- Key components enable individuals to deal with and thrive through both positively and negatively construed situations.
- Key components influence the way in which athletes approach, respond to, and appraise situations demanding mental toughness.
- Aside from the Australian Football Mental Toughness Inventory (Gucciardi et al., 2009b), no psychometrically sound measure of mental toughness currently exists.
- Performance profiling affords a simple method by which to measure mental toughness in the absence of established self-report inventories.
- Obtaining multiple ratings of mental toughness from athletes, their coaches, and parents can help alleviate some of the concerns associated with self-report.
- Both environmental and intrapersonal issues should be considered when attempting to facilitate the development of mental toughness beyond that which occurs through natural development.
- Optimal learning and motivational climates differ at various stages in athletes’ development.
- Coaches are key players in the development of athletes’ mental toughness.
- Critical incidents are opportunities for growth.
- The design of adaptive coach–athlete–performance environments can promote athletes’ mental toughness.
- Psychologists and coaches can work interdependently to facilitate the development of mental toughness.
- Psychological skills training programs targeting key components of mental toughness are effective in enhancing mental toughness. For example, exercises identifying individual and team standards for work ethic, sources of confidence, and solution-focused coping strategies can assist in the development of work ethic, self-belief, and resilience components of mental toughness, respectively.

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