

1 **<sup>1</sup> A phenomenological exploration of exercise mental toughness: Perceptions of exercise leaders and regular exercisers.**

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7 **Abstract**

8 Although elite sport has provided an ideal context for exploring mental toughness (MT), currently, there is scant research examining how this  
9 construct might be equally applicable in exercise settings, where high rates of attrition have been reported. The present research therefore aimed  
10 to address this gap, to understand and conceptualise exercise mental toughness (EMT) through in-depth phenomenological interviews with a  
11 range of exercise leaders and exercise participants. Seven qualified and experienced exercise leaders and seven regular and frequent exercisers  
12 from formal exercise environments (i.e. gym, fitness classes) were interviewed. Interviews were digitally recorded, transcribed verbatim, and  
13 analysed independently by members of the interdisciplinary research team. Key themes were agreed and member checking was used to promote  
14 trustworthiness of interpretations. MT was recognisable in exercise settings, with ten general dimensions found to be relatively consistent with  
15 conceptualisations derived from elite sport (e.g. commitment, focus, emotional control etc.). Importantly, present findings reveal how mentally

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1 tough exercisers think and behave in exercise settings. Some negative consequences were also reported such as over-training and training with  
2 injuries. The article also discusses how components of EMT may be valuable in terms of exercise maintenance and relapse-prevention during  
3 exercise behaviour change.

4 **Keywords:** challenge; commitment; exercise maintenance; over-training; resilience.

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## 6 **Introduction**

7 Amidst evidence of increasingly sedentary lifestyles, the health of the nation has become a growing concern for health professionals and  
8 government in the United Kingdom (UK) (Department of Health, 2011). Research has revealed that regular physical activity or exercise of  
9 moderate intensity can reduce the risk of developing chronic illnesses (e.g. cardiovascular disease, obesity) associated with ‘sedentary’  
10 behaviours (Biddle & Mutrie, 2008). Despite the potential benefits of regular exercise, facilitating change from relatively inactive to active  
11 lifestyles has proven complex and challenging and is influenced by numerous factors (e.g. social, economic, environmental). Psychological  
12 variables such as self-motivation and self-efficacy have been among the best predictors of exercise adherence (Biddle & Mutrie, 2008),  
13 suggesting that whether an individual withdraws or persists with an exercise regime is at least partially influenced by individual resources.

14 Mental toughness (MT) is a term well-established in elite sport (Crust, 2008) and used by athletes and coaches to describe individuals  
15 who are able to persist, and find a way to succeed despite setbacks (Cook *et al.* in press). Given the complex and difficult process of behaviour

1 change, and the potential that some individuals (i.e. mentally tough) may be better prepared to deal with challenges and setbacks, we set out to  
2 understand MT in the under-researched area of exercise maintenance. While the term ‘exercise’ is used throughout, we situate this within the  
3 broader conceptualisation of physical activity as a lifestyle behaviour of which exercise is a subcomponent. In this article, we explore and  
4 analyse using a phenomenological methodology, exercise leaders’ and exercise participants’ perceptions regarding MT in formal exercise  
5 settings (i.e. gym and fitness classes).

6 Increased levels of physical activity following active interventions tend to diminish over time across a broad spectrum of behaviours,  
7 including exercise (Biddle & Mutrie, 2008). Exercise interventions have often focussed solely on developing intrinsic motivation for *initial*  
8 behaviour change, with little consideration of how to integrate and implement programmes to understand mechanisms and processes used to  
9 *maintain* change (Naar-King *et al.* 2013). For those beginning formal exercise programmes, studies typically report high rates of attrition and  
10 relapse, with few managing to maintain exercise for six months or longer (Hillsdon *et al.*, 2005; Hutchison *et al.*, 2013). While much previous  
11 research has focused upon barriers that prevent behaviour change (e.g. Allen-Collinson *et al.*, 2011), some recent studies have also examined  
12 what might be learned from individuals who successfully adopt and maintain physically-active lifestyles (Hutchison *et al.*, 2013). In this context,  
13 MT might be an important individual difference that enables some people to persist during the complex processes of behaviour change. It has  
14 been empirically demonstrated that MT is related to persistence and overcoming barriers in sport (Gucciardi *et al.* 2008; Weinberg *et al.* 2011),  
15 but there is a dearth of research relating MT to exercise adherence

16 *Mental toughness*

1           Generally accepted to be multi-dimensional, MT consists of a constellation of positive psychological attributes (Andersen, 2011;  
2 Gucciardi *et al.* 2009a) although conceptual arguments continue concerning overlap with similar yet distinct constructs such as hardiness or  
3 resilience (Crust, 2008; Gucciardi *et al.* 2013). Some theorists such as Andersen question whether a clear conceptualisation of MT is possible  
4 given the plethora of associated positive psychological attributes that have been reported. While nuanced findings have emerged from qualitative  
5 studies in different elite sport contexts, some common components of MT have been consistently reported (see Crust 2008; Weinberg *et al.*  
6 2011) including confidence, focus, commitment, resilience, and perseverance. Furthermore, several different interpretations of MT exist,  
7 cohering around the extent to which MT is inherited and relatively stable (Clough & Strycharczyk, 2012), as opposed to being socialised or  
8 taught via more formal psychological skills-training (Gordon, 2012). The theoretical debate continues, but both qualitative and quantitative  
9 studies have found that MT is at least partially amenable to development through targeted interventions (Gordon, 2012; Gucciardi *et al.*, 2009b).  
10 Although theory-focused debate is undoubtedly important, there is also a need to apply knowledge of MT to help individuals deal with perceived  
11 adversity and challenges toward the initiation and maintenance of behaviour change such as increased physical activity. The following sections  
12 examine the current understanding of MT from sport research before unpacking the concept in an exercise context.

13           Gucciardi *et al.* (2008, p.278) defined MT as:

14           ...a collection of values, attitudes, behaviours and emotions, which enable an individual to persevere and overcome any obstacle,  
15           adversity or pressure experienced, but also to maintain concentration and motivation when things are going well, to consistently produce  
16           high levels of performance.

1 Thus, while commonly construed as an important resistance resource during confrontations with stress and in times of adversity (Jones *et al.*  
2 2002), Gucciardi *et al.* (2008) also identify MT as key to sustaining effort and maintaining standards when things are going well. Gucciardi and  
3 Mallett (2010) propose that thriving through both positively and negatively construed situations identifies MT as conceptually distinct from  
4 resilience, which coheres around withstanding, recovering and adapting from *adversity*. Another important facet of this definition is that it places  
5 emphasis on how mentally tough athletes *think, feel, and behave*, rather than simply presenting MT as a group of positive psychological  
6 variables.

7 Various models of MT have been presented (e.g. Clough *et al.*, 2002; Gucciardi *et al.*, 2009a; Jones *et al.*, 2007) and despite some  
8 differences, these posit that the qualities of mentally tough individuals (high levels of commitment, self-confidence, psychological control etc.)  
9 facilitate consistent high performance, regardless of prevailing circumstances. Positive responses to challenge and adversity by mentally tough  
10 athletes are associated with distinct appraisals of stress (e.g. as challenge rather than threat) and the use of successful coping strategies  
11 (Gucciardi *et al.*, 2009a; Nicholls *et al.*, 2011). Despite this, few theoretical explanations of how MT operates or develops have emerged. Hardy  
12 *et al.* (2013) identified mentally tough cricketers as being highly sensitive to punishment but not to rewards, with early threat detection used to  
13 plan coping responses. Through establishing that mentally tough players were essentially trait anxious, these findings run counter to most  
14 existing models of mental toughness (e.g. Clough *et al.*) which establish confidence rather than anxiety as a foundation. At present, there appears  
15 to be divergent rather than convergent theoretical explanations of MT.

1           Another recent study (Dewhurst *et al.*, 2012) concerning the cognitive underpinnings of MT found some evidence that mentally tough  
2 undergraduate students are better able to set aside previously learned information and focus upon a cognitive task. This could explain why  
3 mentally tough athletes are able to move on more quickly and successfully following mistakes or setbacks, although the findings are still to be  
4 replicated within sport.

5           Highly pressured elite sport is characterised by the need to perform towards the upper end of capabilities when under pressure, and has  
6 provided an ideal setting in which to understand MT. In this context, MT has emerged as a key concept related to success and progression  
7 (Gucciardi *et al.* 2009b, Jones *et al.* 2007). Nevertheless, numerous other high-pressure domains exist (e.g. business, education, rehabilitation)  
8 where MT is also likely to enable individuals to survive and even thrive when faced with challenge and adversity. Indeed, recent work has found  
9 MT to be linked to success in diverse areas (Clough & Strycharczyk, 2012).

10           One recent study examined the relationship between MT and physical activity with high school students (Gerber *et al.*, 2012). It was  
11 theorised that MT, as a protective resource, would reduce the impact of risk factors such as stress, that can negatively influence mental health  
12 and lifestyle choices such as being physically active. These researchers used the model of MT developed by Clough *et al.* (2002), finding that  
13 students who fulfilled current physical activity recommendations had higher self-reported MT than those who did not. Nevertheless, the cross-  
14 sectional design did not allow direction of causality to be determined.

1           Although not directly concerned with MT, Lewis and Sutton (2011) examined the relationship between the ‘Big Five’ personality  
2 factors<sup>2</sup> (Costa & McCrae, 1985) and frequency of exercise in university gym members. Perhaps the most noteworthy finding was the negative  
3 relationship between ‘agreeableness’ and frequency of exercise. The authors concluded that a certain level of self-focus, even selfishness in  
4 committing to a more active lifestyle is important to successful behaviour change. Recent research concerning coach perceptions of MT in an  
5 elite soccer academy highlighted that self-focus and sometimes selfish behaviours were indicative of the mentally toughest players (Cook *et al.*,  
6 in press). Overall, high levels of commitment and self-motivation, which have been found central to most models of MT, would seem to be  
7 important in terms of exercise maintenance.

8           We argue, as have others (Collins, 2008) that sport and exercise settings often differ substantially from each other. For example, an  
9 emphasis on winning, and beating opponents appears less applicable within many exercise contexts. Nevertheless, while an understanding of MT  
10 has emerged from and is most often explored within elite sport, key components such as confidence, commitment, and resilience are likely to be  
11 equally important in adhering to exercise, coping with setbacks, or circumnavigating barriers to exercise (Allen-Collinson *et al.*, 2011). Previous  
12 contextual differences in MT identified across sports (Crust, 2008), and between athletes and coaches (Gucciardi *et al.*, 2008), underscore the  
13 importance of studying MT in specific contexts. While it might be expected that the core components of MT are influential in all contexts, it is  
14 possible that individual components have greater or lesser emphasis within exercise settings. For example, having the confidence and self-

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<sup>2</sup> Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism.

1 motivation to begin an exercise program and the commitment to continue would seem to be crucial in successful behaviour change (Biddle &  
2 Mutrie, 2008).

3 Gucciardi and Mallett (2010) previously emphasised the importance of a context-rich understanding of MT given the construct appears  
4 somewhat contextually-bound. On this basis it is important to establish how exercise leaders and participants view what might be termed  
5 *exercise mental toughness* (EMT). Furthermore, an understanding of how mentally tough exercisers think, feel, and behave, could eventually  
6 allow the development of more effective interventions to facilitate exercise maintenance. Understanding of the relationship between  
7 psychological variables and adherence could be facilitated as the multi-dimensional nature of MT incorporates key features of known predictors  
8 such as self-motivation and confidence and other potentially important components (e.g. focus, psychological control) less frequently  
9 considered.

10 The main aim of the present research was analytically to chart (rather than explain theoretically) participants' perceptions and  
11 experiences of MT. This is particularly timely given that little attention has thus far been devoted to how MT might transpose to exercise or  
12 physical activity contexts. Given that MT has been associated with success in sports and other challenging domains (see Clough & Strycharczyk,  
13 2012), it is possible that this construct could also be important in exercise maintenance and sustaining behaviour change. A secondary aim is,  
14 based on current results and empirical research, to consider implications for practitioners with regard to supporting participants to maintain long-  
15 term behaviour change.



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## 2 **Method**

### 3 *Participants*

4 Seven exercise leaders (four men, three women), and seven regular exercisers (two men, five women) participated in this study. All exercise  
5 leaders had gym instructor qualifications (e.g. all REPS; Register of Exercise Professionals certified or equivalent and had been in the role for  
6 between 3 and 14 years  $M = 8.6$ ,  $SD = 4.4$ ). They also had a range of other leadership qualifications to teach classes that included exercise to  
7 music, step aerobics, body pump, zumba, aquafit, spinning, circuit-training, and pilates. In addition, two of the leaders were British Association  
8 for Cardiac Rehabilitation Phase IV Instructors working in exercise referral/rehabilitation. All participants were white British and from one  
9 geographic county in the east midlands of England. Exercise leaders were aged between 26 and 45 years ( $M = 33.4$ ,  $SD = 6.9$ ) and had been  
10 regular and frequent exercisers for between 4 and 30 years ( $M = 19.3$ ,  $SD = 7.7$ ). The exercise leaders reported exercising an average of 13 hours  
11 over 5.5 days per week, with all but one leader (who did only weight-training) reporting mixed routines that included both aerobic and anaerobic  
12 sessions. The seven exercisers were aged between 21 and 48 years ( $M = 34.0$ ,  $SD = 12.6$ ) and had been regular and frequent exercisers for  
13 between 2 and 30 years ( $M = 16.0$ ,  $SD = 11.4$ ). These participants reported exercising an average of 9 hours over 5.5 days per week, and all but  
14 one (who undertook only cardiovascular training) reported a mixed routine of aerobic and anaerobic sessions. The project was given ethical  
15 approval by the relevant University Ethics Committee.

1 All participants (leaders and exercisers) were regular/frequent exercisers, which for the purpose of this research we defined as exercising  
2 on at least four days, and for a minimum of three hours per week. Importantly, to establish clear differences from sports-based studies, we  
3 ensured that the exercisers were not athletes who were using gym or fitness classes as part of their athletic training. Commensurate with our  
4 phenomenological methodology, two additional selection criteria were that participants had experience of the phenomenon being studied (i.e.  
5 EMT) and were willing and able to describe their experiences in depth (Polkinghorne, 1989). Of the 18 people invited to take part, 14 agreed and  
6 provided written consent. Two potential participants declined the invitation to take part, and two leaders were excluded due to insufficient  
7 experience.

#### 8 ***The Phenomenological Interview***

9 The form of empirical phenomenology (Allen-Collinson, 2011) we utilised seeks to generate rich in-depth accounts of individual *lived-*  
10 *experiences*. While other qualitative and quantitative approaches focus upon why or how something happened, this form of phenomenology is  
11 primarily concerned with describing *what* participants experienced (Nesti, 2004). Since little is known about EMT, phenomenology is an  
12 appropriate method in enabling the collection of descriptive information that elucidates the *life-world* of mentally tough exercisers.

13 Nesti (2004) proposed the phenomenological interview to be a powerful technique for obtaining rich, descriptive accounts of  
14 participants' *lived experiences*. Characteristically unstructured, the phenomenological interview tends to be open and conversational, with the  
15 freedom to explore emerging concepts, rather than being constrained by a strict interview schedule (Potter & Hepburn, 2005). This approach  
16 enables the participant, as co-researcher (Brinkman & Kvale, 2005), rather than the interviewer, to be regarded as the expert in the phenomenon

1 in question. Nevertheless, it is acknowledged that interviews do not provide transparent windows to some inner private self (Smith & Sparkes  
2 2005).

3         The phenomenological interviews were conducted by the first author and averaged 56 minutes. An interview guide was created and used  
4 flexibly to elicit and elucidate participant conceptualisations of EMT, and to promote rich descriptions of the behaviours, cognitions, and  
5 emotional experiences of those deemed mentally-tough exercisers. Exercise leaders were encouraged to describe what behaviours typified for  
6 them mentally tough exercisers within their classes, and also to provide insights about the thought-patterns and emotional responses of these  
7 individuals based on their personal interactions. Exercisers were asked to describe their own lived experiences. The interviewer encouraged  
8 participants to make comparisons between more and less tough exercisers as a way of describing and defining features of EMT more fully.  
9 Probes were utilised such as “Can you tell me a little more about that?” and “Can you describe what that was like?” to facilitate deeper  
10 understanding of the participant’s experiences and to provide further elaboration. Towards the end of each interview, the researcher encouraged  
11 further contributions by asking, “Is there anything more you can add to further describe *exercise mental toughness*?”

## 12 ***Procedure***

13 Purposive sampling (Patton, 2002) was used to gain initial participants, including two exercise leaders already known to the research team as  
14 appropriately experienced and qualified. Participants were briefed about the nature of the investigation, and given assurances of confidentiality  
15 should they agree to participate. A process of “snowball” sampling (Patton, 2002) was then utilised to recruit other exercise leaders willing to be  
16 interviewed. Importantly, each exercise leader was then asked to recommend an individual from their class/gym who, in their view, epitomised

1 EMT. Interviews were recorded using a digital data-recorder and transcribed verbatim. By analysing each transcript in turn following interviews,  
2 the researchers were able to identify when data saturation was emerging. Following the twelfth interview a notable decline in emergent new  
3 information was observed, and theoretical saturation (Cote *et al.*, 2003) was agreed by the research team after the fourteenth interview.

4 A series of measures was undertaken to enhance the authenticity and trustworthiness of participant accounts and data analysis. One of the  
5 most important of these processes in phenomenological research involves *epochē/bracketing* (see Allen-Collinson, 2011 for a discussion in  
6 relation to sports studies). Bracketing requires the researcher to “attempt to reduce their biases by a suspension of belief in everything that is not  
7 actually experienced” (Nesti, 2004, p. 41-42) although the process can never be complete. In the present study, a bracketing interview was  
8 conducted between two research team members in order to explore potential interviewer bias, and to try to avoid prior assumptions regarding the  
9 phenomenon being transferred into the interview process. In addition, an expert phenomenological researcher team-member, not familiar with  
10 MT research, was involved as part of the team approach to data analysis. The use of an interdisciplinary research team further promoted critical  
11 evaluation and allowed a form of investigator triangulation (Allen-Collinson, 2009).

12 A comprehensive member-checking process (cf. Friesen & Orlick 2010) was also used, where participants were provided with a full  
13 interview transcript in addition to the initial interpretations of the research team. Participants were asked to assess the accuracy of the transcripts  
14 and discuss researchers’ interpretations. Short meetings (approximately 20 minutes) were held between the first author and participants to  
15 challenge or confirm the findings (Friesen & Orlick 2010). Where face-to-face meetings were not possible, this process was completed via  
16 email. Member checking is considered good practice in ensuring that a credible, authentic and plausible interpretation is offered (Culver *et al.*,

1 2003). Participants were given the chance to question interpretations and offer alternative explanations. This process resulted in minor changes  
2 and enhanced the team's confidence in the data interpretation.

### 3 *Data Analysis*

4 Prior to data analysis, a consistent process was agreed by the research team, reflecting a flexible, inductive content approach in order to generate  
5 themes (Silverman, 2001). Commensurate with phenomenological principles, the researchers were mindful to allow the concepts and themes to  
6 emerge from the data, and employed an iterative process of data analysis. The researchers independently analysed the interview transcripts to  
7 identify raw themes and increase trustworthiness. This involved data immersion through multiple readings of the transcripts and the process of  
8 "indwelling" (Maykut & Morehouse, 1994). The researchers separately produced initial discovery sheets of key words, concepts and themes that  
9 emerged from the data, before provisionally grouping common concepts into categories. Initially, data for leaders and exercisers were coded and  
10 analysed separately, however, after a team discussion it was agreed that the most parsimonious account of the data could be achieved by  
11 combining the data due to the consistency of emerging themes. Comparisons were then made between these independent analyses as authors  
12 discussed and eventually agreed on a number of higher order themes and general dimensions. There was a high level of agreement between  
13 researchers concerning the general dimensions, and where minor disagreement existed relating to sub-themes, the transcripts were re-examined  
14 and coding decisions discussed to 'reconcile' analytic divergences (Allen-Collinson, 2013). Individual transcripts were analysed to examine the  
15 appropriateness of the classification of meaning segments into established theme categories (Podlog & Eklund 2007) to enhance the accuracy of  
16 the coding and inductive analysis. Consistent with much qualitative data, there were multiple ways in which data 'segments' could have been

1 interpreted and coded. Nevertheless, some members of the research team had extensive experience (*circa* 18 years) of clinical and non-clinical  
2 exercise/physical activity settings. We thus have some confidence that this familiarity with sub-cultural terminology and meaning helped our  
3 interpretive endeavours. With regard to judgment criteria, and commensurate with our ‘open’, phenomenological approach, we adhere to  
4 relativist, rather than criteriological approaches (Sparkes & Smith, 2009) to evaluating our form of research inquiry. In making explicit our  
5 paradigmatic grounding, and having sought detailed feedback from our ‘expert’ participants vis-à-vis our initial interpretations, we hope that  
6 readers too will have confidence that our findings are firmly grounded in contextual understandings of our participants’ *life-worlds*.

## 7 **Results and Discussion**

8 Consistent with the main aims of this research, the following section provides an overview of participant perceptions on EMT, with verbatim  
9 quotes used to ‘give voice’ to participants. The initial results and discussion section makes comparisons between present findings and existing  
10 MT research from sport in order to highlight potential contextual differences between sport and exercise. This section also makes comparisons  
11 with existing exercise psychology literature related to relevant topics such as adherence and dependence. Finally, the general discussion  
12 considers the main findings and how these can be useful in further understanding, and potentially in planning for behaviour change.

### 13 *The mentally tough exerciser*

1 Participants described attributes, attitudes, behaviours, cognitions, and emotional processes that represent the mentally tough exerciser (See  
2 Table 1). Each of the ten general dimensions which emerged is discussed below. Each participant is identified by a number within parentheses,  
3 with participants 1-7 representing leaders and participants 8-14 the exercisers. Higher order themes existing within these general dimensions  
4 have been italicised within the text.

5 Table 1 here

6 *Motivation to achieve*

7 This general dimension concerns motivational qualities and provides interesting comparisons with sports research. While sport coheres around  
8 competing, competition is not usually considered a key characteristic of exercise/exercise settings. Nevertheless, similar to findings from sport,  
9 mentally tough exercisers were described as having high levels of *competitiveness*, encompassing being competitive with self (comparisons with  
10 self-standards) but perhaps more surprisingly *competitiveness* with other exercisers and instructors. Exercise leaders reported that exercisers  
11 would attempt to turn an exercise class into a competition where achieving greater distance or enduring a task for longer than others was seen as  
12 the goal. This *competitiveness* was also reflective of behaviours in exercise classes and choice of activities. As one leader noted:

13 They almost want to do everything at 100 mile an hour in almost every exercise, as quick as they can, you know. They come to the sort  
14 of higher intensity classes that we do. But if you put them into more of a Pilates situation, for example, where the focus is on slow,  
15 controlled movement and it's quality of the movement and not quantity, I think they find that difficult and to some extent, wouldn't enjoy  
16 it (3).

1 Mentally tough exercisers were reported to work at a consistent high intensity that singled them out from other exercisers, although this at times  
2 resulted in negative consequences (see over-commitment below). Mentally tough exercisers were able to maintain their own motivation without  
3 the need for encouragement from leaders.

#### 4 *Goals and sense of purpose*

5 Having *clear goals* for the long-term and for each particular exercise session was indicative of EMT. Exercise leaders endorsed the importance  
6 of clear goals and contrasted this with less tough exercisers with only “a very vague sense of their goal” (1). Exercisers reported that long-term  
7 goals were often in their mind during particularly tough sessions, and provided a sense of purpose or meaning, motivating attendance at classes  
8 or the gym, even when feeling less motivated to do so. A number of exercisers reported thinking through short-term goals (for that session)  
9 while travelling to the gym. A key feature of EMT was that long-term goals tended to be more fixed, while short-term goals were seen as  
10 flexible so long as these were aiding progress towards the overall aim, for example: “Friday nights you might go, it’s quite busy, like I’ll go in  
11 there thinking I’d better go on the treadmill and they’re all taken. So I’m like right, I’ll do something else that I’ll completely change. It’s not  
12 rigid” (8). Having some flexibility in terms of short-term goals would appear important in adapting to changing life circumstances (e.g. setbacks,  
13 constraints) whilst maintaining a feeling of progression.

#### 14 *Focus*

15 Consistent with sport literature (Gucciardi *et al.*, 2008; Weinberg *et al.*, 2011), participants reported focus as a key characteristic of EMT. Three  
16 higher order themes were reported, the first of which was a *task-oriented focus*. This represented deep engagement with the task and meant that



1 potential distractions were set aside. This theme did not represent being less sociable, but reflected the desire to concentrate and not be disturbed  
2 or distracted during the ‘work’ of exercise.

3 Those that seem tougher, are more serious during the actual class or the actual session itself, more focused perhaps, on the task in hand. I  
4 think it’s a case of when they’re actually taking part in the activity, they are focused and wanting to work (3).

5 The second theme of *self-focus* was subtly different and concerned deliberately avoiding interactions with others, engaging in more ‘monadic’ or  
6 insular behaviours that allowed the mentally tough exerciser to focus on self. This went beyond a task-oriented focus and included body-  
7 monitoring during continuous exercise. One exerciser (10) reported that: “I like tuning into my body and I’m thinking about more of my body  
8 than I am what’s going on around”. Perhaps one of the most interesting and consistent findings concerned the third higher order theme of *rapid*  
9 *refocus*, where following goal achievements or setbacks, mentally tough exercisers would quickly refocus onto the next goal or task. There was a  
10 sense of urgency or impatience to move on, not necessarily because mentally tough exercisers did not reflect (quite the opposite),

#### 11 *Reinforcement from hard work / sweating and aching*

12 This general dimension relates to the satisfaction, pleasure and reward that mentally tough exercisers obtain from pushing their bodies to the  
13 point of exhaustion. Whilst reference to work ethic/work rate are commonplace in the MT literature (Gucciardi *et al.*, 2008) the present findings  
14 were more indicative of embodied experiences and positive associations between symptoms of fatigue (including pain) and a sense of  
15 satisfaction that the exercise session has been worthwhile. This finding is commensurate with research on other physical cultures such as body-

1 building (Shilling & Bunsell, 2009) and distance-running (Allen-Collinson, 2009) where the feeling of pushing the body ‘to the max’ is sought,  
2 even when painful. According to one participant, “the pain thing is almost a satisfaction” (14). Whilst to some less tough exercisers the signals  
3 of working hard (e.g. sweaty body, aching muscles) would be repugnant, mentally tough exercisers felt reinforced by these sensations.

4 I like the feeling of you know, when you’ve worked hard and you’re sweaty or you’re aching already and you know the next day you’re  
5 going to wake up and it’s going to be a struggle to get out of bed! (8)

## 6 *Commitment*

7 This general dimension is indicative of how much a mentally tough exerciser invests in their goals. *Prioritising exercise* is a key theme which  
8 demonstrates commitment through such behaviours as regular attendance, arriving early and being prepared to make sacrifices to ensure time for  
9 exercise. “The dedicated committed ones will come all the year round, come what may. There won’t be those barriers in place; they won’t allow  
10 anything to take over what they enjoy doing or what they see as a habit” (4). As one exerciser reflected, it involves: “overcoming your normal  
11 excuses...because there are 1001 excuses why you can’t [exercise]. I think sometimes mental toughness is just getting yourself there in the first  
12 place” (14). Another key theme was having a *no-nonsense attitude*, viewing exercise as a job that needs completing. One of the leaders referred  
13 to mentally tough exercisers as “no-nonsense sort of people” (1). Mentally tough exercisers reported *reflection and analysis* in the aftermath of  
14 success and failure. This was purposeful and goal-oriented thinking that involved quantitatively monitoring one’s own performances, analysing  
15 errors (reasons for failure) and planning for progression. The final higher order theme of *tenacity* represented being able to remain steadfast and

1 obstinate when faced with challenges or adversity. While the term tenacity has not been regularly used to describe MT in sport, persistence and  
2 determination have been consistently reported. The tenaciousness of exercisers reflects the meaning and value of the outcomes that they are  
3 striving to achieve. One exerciser simply stated that “It's like I won't give up; I won't let it [hard exercise] defeat me” (9). The importance of  
4 commitment in relation to behaviour change is reinforced by one leader who stated that “the people that are mentally tough, if they don't see a  
5 change straightaway they'll still keep working towards it.” (2)

#### 6 *Over-commitment*

7 Much previous research concerning MT has focused exclusively on the positive psychological variables characterising successful sport  
8 performance. Present findings are supportive of Andersen (2011) who suggested potential drawbacks to being mentally tough in sport that can  
9 lead to maladaptive thinking and dangerous behaviour. The general dimension of over-commitment has certain parallels with exercise  
10 dependence/addiction. Participants reported that mentally tough exercisers did not always follow sensible exercise plans incorporating sufficient  
11 rest intervals/days, and felt compelled to add extra, intense sessions following missed classes, low-intensity training, or perceived unsatisfactory  
12 performances: “If I've had a bad session then I'll do an extra one at the weekend or something to make up for it” (9). Most of the exercise leaders  
13 reported that mentally tough exercisers tended to over-train.

14 They will do over and above and sometimes I say well, maybe you need a rest day today and I'll be training someone else and I'll see  
15 them on the treadmill sort of thing, you know. So in actual fact, they're quite hard to rein in at times (1).

1 Of particular concern is the tendency to train when injured thus risking incurring a more serious injury. In the case of one exerciser this involved  
2 not allowing sufficient time to recover from injury because of the desire to exercise again.

3 I've struggled with coping with the injury. I've come back from injury too quickly and pushed myself too hard, too soon and I've then  
4 got re-injured and that has been a massive, that's actually taken a lot longer to get over (11)

5 Participants also reported that mentally tough exercisers tended to be very *self-critical*, primarily regarding self-talk and the need to meet very  
6 high self-expectations. In the case of one exerciser, this went further and involved physically hitting himself (not causing self-harm) when falling  
7 below his own expectations.

#### 8 *Learning and growth orientation*

9 An appetite for learning and development was indicative of mentally tough exercisers. While the less tough were content with repeating previous  
10 sessions and exercising within a 'comfort zone', this was reported as anathema to mentally tough exercisers, to whom progression was the main  
11 aim. Mentally tough exercisers would seek guidance in order to improve.

12 They'd be wanting to know more at the end of the session. They're thinking always about how and what more they could do to get better  
13 in losing weight or increasing their fitness levels. They don't seem comfortable with keeping what they're doing for a while. They want  
14 to move on to the next step (4).

1 When plateaux were reached, mentally tough exercisers were soon thinking about what changes could be made in order to progress. As one  
2 stated, “Every problem can be solved, it’s just about finding different routes in how to do it. I get an excitement from figuring out how to do that  
3 as well” (11). In contrast to mentally tough athletes pushing through physical barriers (Jones *et al.*, 2002), these exercisers were more adept at  
4 circumnavigating problems by thought rather than muscle. As well as *adaptive and flexible thinking* participants also reported *adaptive*  
5 *behaviours* that were most evident when exercisers were injured. Most exercisers reported still attending the gym or exercise session when  
6 injured but switching their focus to working and improving non-injured areas: “If I’ve hurt my left leg then my arms are fine and my stomach’s  
7 fine so there’s no reason not to exercise those bits” (14).

#### 8 *Resiliency*

9 This general dimension concerned the responses of mentally tough exercisers when faced with difficulties or setbacks. Maintaining exercise  
10 behaviours over the long-term is often challenging in light of the multiple demands (family, work etc.) from other life domains but also because  
11 exercise can be unpleasant at times. Mentally tough exercisers were good at *remaining positive in tough times*, often via thinking about how  
12 good they would feel about themselves if they completed a tough exercise session. Setbacks or failures were viewed as a natural part of the  
13 learning process which facilitated motivation, and enhanced future efforts. If a mentally tough exerciser experienced a setback, “they’d be: like,  
14 right let’s do it again, let’s do this test next week. Whereas somebody else would be like well, let’s hold off on that for a while” (1). Various  
15 forms of coping with the pain associated with repetitive and high-intensity exercise were reported but one of the most interesting concerned a re-  
16 evaluation or downgrading of sensations over time. “I suppose it’s in my mind I’m thinking that before I felt it was pain, but now I’m thinking

1 it's more, it's feeling tough, it's more like, like I say, discomfort, so I give it a different name" (13). Another more commonly reported approach  
2 was 'switching off' or ignoring the pain. In sum, mentally tough exercisers did not dwell on failures and actually were more likely to intensify  
3 efforts following setbacks.

#### 4 *Control over emotions / stability*

5 The emotional oscillations of mentally tough exercisers were generally reported to be mild. Although there was evidence to support effortful  
6 control or managing emotions, there were also indications that mentally tough exercisers were emotionally stable, with one participant reporting  
7 "I don't get like you say, highs or lows" (8). Nevertheless, emotional control was more consistently reported.

8 I think if you're mentally tough and you're that driven you maybe don't allow yourself to have a broad range of feelings because you're  
9 trying to be tough and like you're trying just to do everything as well as you can, like you ignore feelings, that you ignore maybe your  
10 body or your mind telling you that you're tired or can't be bothered or, I don't know, feel sad or fed up but you actually ignore that more,  
11 whereas people who aren't as mentally tough will probably just accept their emotions maybe and give up or not do - or not try as hard. (9)

12 Similarly, Crust (2009) found mentally tough athletes were not 'less emotional', but rather were better at controlling their emotions, and this has  
13 been a consistently reported component of MT in sportspeople (Clough *et al.*, 2002; Gucciardi *et al.*, 2008). While some leaders indicated that  
14 on rare occasions emotions such as disappointment, frustration or joy were evident, these were generally short-lived as the exerciser moved on to  
15 focus on their next goal.

## 1 *Challenge appraisal*

2 One of the defining features of the mentally tough exerciser was found to be appraisal of challenge rather than threat. There was evidence of  
3 *challenge-seeking* behaviour which, consistent with the model of Jones *et al.* (2009), was underpinned by *self-belief*. While confidence and self-  
4 belief have been posited as the ‘cornerstones’ of mental toughness in sport, the present research is more indicative of belief in achieving goals  
5 and in the ability to change as facilitating challenge appraisals. Excitement rather than trepidation about challenges was commonly reported.

6 When I’m faced with a challenge I’m quite often very excited. That’s the first thing that normally comes into my mind, is that, ‘How am  
7 I going to achieve this?’ This is quite exciting for me. It’s quite often something new; I have to learn something (11)

8 Similarly, another exerciser emphasised the attraction to seeking harder options and viewing this as motivating.

9 And you know when they give you an option, like an easy option or a hard option, I’m always going for the hard option. But you can see  
10 with the people that pick the easier option first before even trying maybe the harder option, whereas I’ll always start with the harder  
11 option (9).

12 These were the ten general dimensions that emerged from data analysis

## 13 **General Discussion**

1 The main purpose of the present research was to begin to describe and understand EMT. This has enabled comparisons to be made between  
2 exercise and sport domains. In addition, present findings offer some applied implications with regard to the important area of exercise  
3 maintenance, given the exercise habits (e.g. frequent attendance) of mentally tough exercisers.

4 Exercise leaders reported that mentally tough exercisers could be identified within group or individual sessions, by their work rate,  
5 competitiveness, and preference for intense, demanding exercise. In addition, displaying high commitment (e.g. attending frequently),  
6 responding positively to setbacks, possessing a thirst for knowledge, having a sense of purpose, limited emotional expression, and embracing  
7 rather than avoiding challenges, were also indicative of EMT. Given the vast array of positive psychological variables used to represent MT  
8 within sport (see Andersen, 2011), it is not surprising that descriptions of EMT cohere around similar themes to those previously reported. There  
9 are nonetheless, several important comparisons that can be made which highlight contextual differences and similarities. For example, mentally  
10 tough athletes have been found to be highly competitive and according to our findings this characteristic also appears within exercise settings.  
11 Mentally tough exercisers were adept at creating competition and competing with others (including leaders) to achieve more work or endure high  
12 intensity exercise for longer.

13 One of the most interesting findings was that exercisers not only maintained a task-oriented focus during exercise, but also retreated into  
14 an inner-world and focused upon themselves, their body and corporeal sensations, and deliberately avoided interactions with others. Lewis and  
15 Sutton (2011) previously explained that self-focus, even selfishness, were important in physical activity behaviour change. Prioritising personal  
16 time to exercise over other commitments (e.g. family, social relations) may be important in establishing and maintaining exercise as a habit, as



1 time constraints are consistently reported barriers to exercise. While less frequently reported within sport there is some evidence of ‘selfish’  
2 behaviours linked to MT and progression in professional soccer (Cook *et al.*, in press).

3 Caddick and Ryall (2012) have been critical of the social construction of MT, and the presentation of a romantic sporting ideal or  
4 ‘superhuman’ quality reminiscent of the ‘Hollywood hero’. Similarly, Andersen (2011) connects the concept of toughness to a ‘macho’ culture  
5 of sport, critiquing research that constructs ‘fantasies’ of the ideal mentally tough athlete. This particular version of masculinity could be argued  
6 to have been reinforced within exercise settings, as our data are replete with references to ‘pain as satisfaction’, having ‘no excuses’, or ‘pushing  
7 to the maximum’. However, these were not idealised states but actual perceptions of ‘real’ exercisers, and interestingly, there were more women  
8 than men who were identified by leaders (male and female) as epitomising MT. Some might argue that these ‘tough’ female exercisers are  
9 ‘locked in’ or complicit in the (re)production of dominant forms of masculinity, but such a fixed notion of what constitutes masculinity fails to  
10 account for the social construction and relationality of masculinity and femininity, and how these are produced by social actors in specific  
11 contexts. Indeed other research has found women to be constructed as equally or *more* ‘tough’ and pain-enduring than men (e.g. Bendelow,  
12 1993; Pike, 2005).

13 Andersen (2011) argued that MT may be accompanied by a ‘dark side’ that is less frequently explored, where the macho attitudes  
14 associated with the construct may lead to damage, distress, and even intolerance. There is some evidence from the present research that MT may  
15 not be exclusively positive, with exercisers reporting being highly self-critical, adopting a ‘no pain, no gain’ philosophy and demonstrating a  
16 tendency to over-train. In some cases, but not all, there was a willingness to train through pain and injury. These appear to be maladaptive and

1 potentially unhealthy behaviours that have some commonalities with exercise-dependence (McNamara & McCabe, 2012); future research might  
2 profitably examine these relationships more thoroughly.

3         A consistently reported finding was that mentally tough exercisers would rapidly refocus on the next goal or task following both setbacks  
4 and success. It is possible that this is tied to emotion management as participants didn't dwell on success or failure but attended to the next  
5 objective. Carver and Conner-Smith (2010) clarified how the appraisal of events leads to emotions. The analytic thinking and problem-solving  
6 reported by some participants during later reflection appears to fit with avoiding appraisal in the immediate aftermath of self-perceived success  
7 or failure. Whether this was a deliberate strategy - which might be consistent with the theorising of Hardy *et al.* (2013) and the notion of pre-  
8 planned coping - or merely a common characteristic of the sample, remained unclear. There are however, some parallels between this and the  
9 work of Dewhurst *et al.* (2012) who found significant relationships between cognitive inhibition and mental toughness using the directed  
10 forgetting paradigm, where participants with higher MT were able to set aside previous information to avoid cognitive interference with  
11 upcoming tasks. Nevertheless, further qualitative approaches in other contexts, and quantitative approaches using cognitive paradigms are  
12 needed to understand the significance of this finding.

13         As with any study, there are limitations. First, the data were collected within only one geographic region and single rather than repeat  
14 interviews were undertaken with participants. Second, the present study included participants who were already habitual exercisers and therefore  
15 future longitudinal research could examine the 'adoption' as opposed to 'maintenance' stage of behaviour change. Third, it is acknowledged that  
16 the formal exercise settings used within this study fall within the broader physical activity domain, and research that considers a wider range of

1 physical activities is needed. Fourth, while the focus on MT in frequent and regular exercisers adds to existing knowledge, it is acknowledged  
2 that different exercise classes, different leaders, and different participants are likely to produce differently nuanced results. Nevertheless, when  
3 present findings are compared with evidence from sport, the construct of MT is still clearly recognisable within exercise settings.

4

## 5 **Conclusion**

6 The knowledge gained in this study may be of use to applied practitioners. Whilst we identify some areas for consideration, we also urge caution  
7 as the results are based on a small and purposefully selected sample that may not be representative of the whole population of mentally tough  
8 exercisers. First, participants in the present study valued high intensity exercise and competition, and leaders working with similar exercisers  
9 need to consider creating challenging, varied sessions that avoid repetition or exercise ‘comfort zones’. This could involve careful planning to  
10 balance need for progress with consolidation. Second, the importance of quality of movement or technique may need to be reinforced, as  
11 exercise leaders reported this was often deemed of secondary importance to work output. Third, the importance of rest days, and sufficient  
12 intervals between exercises need to be emphasised to reduce the risk of over-training. Finally, leaders might closely monitor exercisers who are  
13 injured, because of the possibility of returning to exercise before sufficient recovery. Given the potential for over-commitment, leaders could  
14 work with exercisers to design sessions, where appropriate, that safely target non-injured limbs and muscle groups to satisfy the desire to keep  
15 training.

1           Gaining knowledge of how mentally tough exercisers think, feel and behave is an important development that may eventually benefit less  
2 tough exercisers. For example, the identified importance of *focus and* an awareness of *self* as components of EMT indicates that approaches such  
3 as ‘Mindfulness’ (see Bishop *et al.*, 2004) could be useful in maintaining exercise behaviours. Moreover, other psychological interventions such  
4 as Motivational Interviewing (MI; Miller & Rollnick, 2013) appear effective in eliciting motives and barriers to change as well as exploring  
5 client values and attitudes across a range of settings. The current results suggest that encouraging *commitment* to change is fundamental in EMT.  
6 Developing effective maintenance strategies were reflected by participant descriptions of needing a *rapid re-focus, reinforcement, tenacity* and  
7 *remaining positive in tough times*. Integrating approaches such as MI with Cognitive-Behavioural (CB) interventions can be helpful in managing  
8 the risk of relapse and has found support in many other health behaviour contexts (Naar-King, *et al.* 2013).

9           Consistent with CB approaches, descriptions of EMT illustrated the need for *guidance* rather than always *going it alone*, where aspects  
10 such as gaining support, identifying supportive environmental conditions and self-monitoring underpin behaviour change techniques.  
11 Developing strategies in an explicit and transparent manner is important when attempting to control temptations to return to a more inactive  
12 lifestyle, and this need to *manage emotions* and *gain stability* was again highlighted by exercisers and exercise leaders alike as important aspects  
13 of EMT. Poor levels of compliance and adherence to recommended interventions undermine the efficacy of many community-based lifestyle  
14 modification programmes (Biddle & Mutrie, 2008). Statements from both exercisers and exercise leaders suggest the need to understand more  
15 fully the attitudes and values of individuals before developing a focussed plan that is both challenging yet attainable.

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1 Table 1. Participant descriptions of exercise mental toughness.

Example Raw Themes	Lower Order	Higher Order	General Dimension
They're competitive with themselves and with other people (1).	Competitive with self Competitive with other exercisers Competitive with instructors They make it a competition	Competitiveness	Motivation to Achieve
When you exercise like I do [intensity] you just stick out like a sore thumb (14)	Always give their best Every session has to be hard Striving for personal bests	Consistent and intense strivings	
Very self-motivated, not needing somebody close to go, 'One more, come on!' Not needing that kind of external feedback (11)	Self-motivated Keeps motivated Doesn't need encouragement	Maintains own motivation	
It's having goals, definitely, that helps, that is the reason why I go every day (9) I like to run with a goal in mind, as in a long-term goal (13)	Know what they want Know what they are aiming for Long-term goals (sense of purpose) Goals for each session	Clear goals	Goals and Sense of Purpose
Most of the time [goals] have to be very flexible, mainly I guess because you feel different every day (11)	Flexible goal-setting Resetting goals (if too difficult or easy)	Flexible goals	
When they're actually taking part in the activity, they are focussed and wanting to work (3)	Focused on the task at hand Attentive Tunnel vision Tune-out / avoid distractions	Task-oriented focus	Focus
While I'm exercising I don't talk to people or anything (9) Gym time is my time (12)	Avoiding interactions with others (Self-contained focus) Body monitoring	Self-focus	
It's a small buzz [achievement] and I'm thinking about the next thing	Moving on (shifting focus) quickly after achievements or setbacks	Rapid refocus (after exercise)	

already (9)			
They need to be, of the nearly exhausted situation for them to feel good about themselves (6) If I'm doing something and it's really hurting I'm thinking this is really good (9)	Need to push themselves Desire to be pushed further by leader Need to be sweating and aching Resistance to regeneration sessions (less satisfying) Not hurting is not working hard enough	Only satisfied after hard physical workout	Reinforcement from hard work / sweating and aching
I love pushing the boundaries and seeing what my body can do and how far it can go (11)	Pushing to the limit / physical boundaries Pushing through barriers Doing more and working harder than others	Working to maximum	
Completely and utterly determined to keep physical activity within their lifestyle (4) They'll make an hour, two hours out of their day to come in, do their thing (2)	Regular attendance Arriving early Prepared to change lifestyle / make sacrifices Nothing to interfere with goals Attend regardless of circumstances	Prioritising exercise	Commitment
I normally need to know where I've gone wrong...I'm very analytical (11) I've got a whole training diary. I even look back two years to see how I'm comparing (14)	Compare to previous sessions Mental review of the session Reflect on goal importance Monitors own performance Planning for progression	Reflection and analysis	
I didn't come here for no reason... I don't like the feeling of you know, wasting an opportunity (10).	No excuses Strict regime Get on with it Serious about exercise Avoids breaks	No nonsense attitude (it's work)	
You've got to be tenacious; you've got to stick at it (14)	Persistence Perseverance	Tenacity	

	Stubborn determination		
Very hard on myself if I miss a day or something like that (9)	Hard on themselves after missed session Critical self-talk	Self-critical	Over-commitment
I've come back from injury too quickly and pushed myself too hard, too soon and I've then got re-injured (11)	Exercising when injured Tendency to over-train Over-train after missed session (compensate) Training through rest days	Over-training	
I'm just always looking for ways to try and improve (9) I will ask for advice especially from someone I know (14)	Ask advice of instructors Growth minded Learning from other exercisers Reading and searching for information	Seeking new knowledge to improve	Learning and growth orientation
So I'm thinking about actual change and it's in my mind that I'm allowing myself to be flexible (8)	Thinking of ways around problems Openness to change Flexible routes to goals	Adaptive and flexible thinking	
You're never that injured that you can't exercise something (14)	Different exercises when injured Adopts new approaches	Adaptive and flexible behaviours	
I think they're very good at turning things [setbacks] into positives and very quickly (1)	Thinking about sense of achievement and positive feelings to come Taking the positives from negatives Setbacks inspire motivation It will get easier	Remaining positive in tough times	Resiliency
High threshold of pain or could just block it out and work through it (5)	Dissociate from pain Pain tolerance / acceptance Downgrading pain to discomfort	Coping with pain	
When I have had a setback I almost try even harder because I don't want to have tried and failed (11)	Intensified efforts after failure Doesn't dwell on failures	Moving on after failure or setbacks	
I don't really have many emotions (11)	Few emotions Small range of emotions	Narrow range of emotion	Control over emotions / stability
They'd never really get that excited	Stable emotions	Mild emotional experiences	

or they'd never really be that disappointed (1)	Few highs or low		
Short lived [emotions] because they're going onto the next thing (4)	Keep emotions in check Short-lived gratification / disappointment (refocus)	Emotions under control	
I quite often put myself in a challenging situation which I either sink or swim (11)	Choosing the harder option Making things more difficult Approaching challenging situations Excited by challenges / problem solving	Challenge seeking	Challenge Appraisal
They believe they're going to get there and again I think it's a self belief in what they want to do (6)	Belief in achieving goals Belief in own abilities Belief in ability to change	Self-belief	

1

2