

An Exploratory Study on the Psychological Factors of Mental Toughness:

Perceptions of PE Teachers in Singapore

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Abstract

Mental toughness is often perceived to be important in helping athletes overcome mistakes and adversity when competing under pressure. However, common conceptions of mental toughness tend to vary. Thus, the purpose of the study was to a) identify the typical psychological challenges faced by student athletes as perceived by PE teachers, and b) analyze how their responses compare and fit with existing models (e.g., Clough, Earle, and Sewell, 2002; Middleton, Martin, and Marsh, 2011). 143 responses were gathered from a survey of PE teachers involved in the coaching of student athletes in several local schools to identify specific mental toughness issues present in local student athletes. Based on content analysis of responses collected, the study identified several descriptors derived from perceived psychological challenges faced by student athletes. In the second half of the study, these descriptors were further classified into six factors identified by several existing models (e.g. Clough et. al., 2002). The study confirms the existence of several underlying descriptors of mental toughness that could be derived from commonly perceived psychological challenges faced by student athletes. Further analysis leads us to believe these descriptors fit the classification of several mental toughness factors identified by several existing models, showing us that no singular model encapsulates mental toughness accurately. This exploratory study suggests that further research is necessary to understand this construct in an Asian context. It also holds further implications for physical education teachers, coaches, and performance/sport psychologists, as the factors identified could potentially be used to develop methods to facilitate the development of mental toughness. More importantly, they would help identify specific areas of development for select groups of individuals.

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In the realm of sport, judging how athletes perform remains an issue at the forefront of PE teachers, coaches, and experts alike. To strive for a greater understanding in this area, considerable research has been invested into mental toughness, a critical concept now thought to be closely related to peak, successful performance (Crust & Azadi, 2009). However, as Crust et. al. (2009) have aptly stated, the verdict is still out on the exact definition of what exactly constitutes this construct.

Numerous models and general attributes, thus, have been proposed to try to define underlying factors thought to encompass the entirety (or in some, the structural outline) of mental toughness (Clough, Earle, & Sewell, 2002; Gucciardi, Gordon, & Dimmock, 2008; Middleton, Martin, & Marsh, 2011).

Given the now-substantial scientific rigor provided by recent research in understanding the factors underpinning mental toughness, we can draw upon this wealth of knowledge to help achieve two aims in this study, to: a) identify the typical psychological challenges faced Singaporean student athletes as perceived by their PE teachers, and b) analyze how their responses compare and fit with existing models and general attributes (e.g., Clough, Earle, and Sewell, 2002; Middleton, Martin, and Marsh, 2011; Harmison, 2009).

The model of Clough et. al. (2002), which consists of the six factors of: Challenge, Commitment, Control (Emotion), Control (Life), Confidence (Abilities), and Confidence (Interpersonal), was chosen as an initial working model for comparison.

Its choice was apt, given its use as the basis for the Mental Toughness Questionnaire-48 (MTQ-48), arguably one of the most widely-used measures of mental toughness, with strong validity and reliability as a psychometric instrument (Perry, Clough, Crust, Earle, & Nicholls, 2013; Nicholls & Polman, 2007; Gucciardi, Mallet, Hanrahan, & Gordon, 2011).

Harmison's (2009) general attributes of mentally tough athletes (2009), and the MTI model of Middleton et. al. (2011) were used as further bases for comparison given the relatively exhaustive list of factors and attributes provided.

In the current study, it was primarily hypothesized that the 6-factor model of Clough et. al. (2002), may not be able to fully capture the underlying factors of mental toughness relevant to local student athletes.

It was then further hypothesized that the psychological challenges and resultant descriptors relevant to mental toughness that were not encapsulated by the model of Clough et. al. (2002), could possibly map across other models and general attributes in the existing literature. This would then show that mental toughness is not accurately encapsulated by any one model.

Method

Participants

Seeing as individuals closely involved with student athletes have been shown to provide meaningful insight into mental toughness (Driska, Kamphoff, & Armentrout, 2012). This study incorporates this notion into its methodology.

Physical education teachers (N = 143) from a variety of Singapore local schools, having collectively taught or coached a variety of sport teams were selected.

To avoid bias of generalization, it was ensured all participants were currently involved with an active population of student athletes, providing them with a relevant reference point from which they could construct a reliable impression of mental toughness.

Materials

Taking into consideration time and commitment constraints, the participants were each asked to catalogue their individual responses into three separate points on several conveniently-sized slips of paper.

This was also done to alleviate the possible confounding effect of fatigue from dictating an overly long set of responses, in addition to respecting time constraints of the participants involved.

Procedure

Participants were attendees of a PE conference, and were asked to identify three psychological challenges they felt most accurately described mental toughness (or lack of it), based on observation of current and past athletes, and record them on the slips of paper provided.

These responses were then collected and sorted based on their similarity at face value, and further classified into several general descriptors.

Each response was read, organized, and grouped into general descriptors, as previously described. These descriptors were then systematically analyzed against Clough et al.'s (2002) MTQ-48 model, Harmison's attributes (2009), and Middleton et. al.'s (2011) MTI model.

The perceived issues were sorted into these descriptors under two conditions, they (1) did not address an irrelevant construct (e.g., aggression), and (2) contained challenges or issues that matched a descriptor addressing an underlying factor of mental toughness outlined by the models and attributes.

These descriptors were then matched to relevant factors from the relevant models and general attributes outlined in this study, yielding a six-factor model of mental toughness.

Results

Table 1 provides a breakdown of underlying factors and their defining attributes, which lends support for the hypothesis that no one existing model accurately encapsulates mental toughness. This brief qualitative study also lends support to the underlying factors underpinning one of most widely-used models in assessing mental toughness.

However, the participants occasionally provided descriptions of attributes that did not satisfy the requirements in the context of the model of Clough et. al. (2002).

Added insight was provided through inclusion of Harmison's (2009) general attributes of mentally tough athletes, and the MTI model of Middleton et. al. (2011). This allowed us to construct a six-factor model to address the unclassifiable responses under the model of Clough et. al. (2002).

Table 1. Underlying Mental Toughness Factors and Related Descriptors

Factor	Descriptor	Number of Issues
Emotional Control (Clough et. al., 2002)	<ol style="list-style-type: none"> 1. Inferiority feelings / Intimidation 2. Anxiety 3. Fear / Being Fearless / Managing Fears 4. Staying positive 5. Panic / Collapsing Under Pressure / Breakdown / Choking 6. Stress 7. Getting Demoralized 8. Coping 	55
Confidence (Abilities) (Clough et. al., 2002)	<ol style="list-style-type: none"> 1. Lack of Confidence 2. Self-belief (or lack of it) 3. Overconfidence 4. Self-esteem 5. No killer instincts 6. Trusting Skills 	47
Commitment (Clough et. al., 2002)	<ol style="list-style-type: none"> 1. Personal Motivation 2. Overcoming failure 3. Persevering / Enduring / Sustaining Motivation 4. Be disciplined 5. Being driven / Tenacious 6. Giving Up 	37

Table 1. (continued)

Factor	Descriptor	Number of Issues
Staying Focused (Harmison, 2009)	1. Sustain focus / Staying focused	16
	2. Eliminating disturbances	
	3. Composure / Dealing with pressure	
	4. Concentration	
Challenge (Clough et. al., 2002)	1. Not challenging themselves regardless of skill	8
	2. Respect opponents too much	
	3. Win/Loss concerns in matches	
	4. Handle aggressive opponents	
	5. Dwell on mistakes / Dealing with trailing	
Task Familiarity (Middleton et. al., 2011)	1. Lack seriousness	8
	2. Fumble / Unforced Errors / Brain-freeze	
	3. Cannot perform despite being good in training Translating training into competition / Off-form	
	4. Playing to the max	

Note. 5 issues / challenges were omitted for irrelevance.

Discussion

What are the Relevant Mental Toughness Factors?

The current investigation gave support for 4 out of 6 factors found in the model of Clough et. al. (2002). Through the aid of the model of Middleton et. al. (2011) model and Harmison's (2009) general attributes, two additional factors of (a) task familiarity and (b) maintaining focus, were observed through constant patterns detected in the responses.

A "New Model" of Mental Toughness

This exploratory study suggests that current models do not accurately encapsulate mental toughness as a whole, which lends support to the variance in underlying factors found

across models. The descriptors found in the study were matched to factors present across existing models and attributes, lending support for an integrated six-factor model.

Current Limitations of the Study

However, the study remains limited by a selective participant pool (i.e., PE teachers), who may have already encountered a variety of performance environments that individuals from other populations may not have. Thelwell, Such, Weston, Such, and Greenlees (2010) have also given reason to believe that different perceptions of the underlying factors of mental toughness may potentially occur in different populations.

The second limitation of the study is the method through which responses were recorded. As noted, some PE teachers gave invalid responses that did not accurately reflect mental toughness. In part, the method of collecting responses, which was designed with time and commitment constraints in mind, could have prevented some participants from properly evaluating their responses.

Practical Implications

Several studies have shown support for the notion that mental toughness can be developed through specific training programs (Gucciardi, Gordon, & Dimmock, 2009a; Gucciardi, Gordon, & Dimmock, 2009b; Connaughton, Hanton, & Jones, 2010).

This study found several mental toughness factors that appear to match the developmental skills and strategies provided in the mental toughness training model proposed by Tham and Weigand (2010). This model was mainly developed to address the common mental weaknesses of competitive athletes, and Table 2 below provides a brief outline. It is further proposed that mental toughness training be periodized to fit into the respective sport-specific coaching plan.

Table 2. Matching matrix between current 6-factor result and mental toughness strategies model

Current 6-Factor Result	Tham and Weigand (2010) - Mental Toughness Strategies Model					
	Goal-setting	Imaginal Experiences (Imagery / Self-talk)	Composure	Concentration	Confidence	Coping with Challenges
Commitment	✓	✓				
Emotional Control			✓			
Staying Focused				✓		
Confidence (Abilities)					✓	
Task Familiarity						✓
Challenge						✓

It is argued that a long-term, systematic mental skills development program would ensure that athletes are given ample time and opportunity to apply the respective mental skills into their training regimes and competition events for greater automaticity.

Appendix A identifies the specific mental toughness training strategies specified by Tham and Weigand (2010) for developing and maintaining high levels of mental toughness over the course of the competitive season or year.

On a final note, the model of Tham and Weigand (2010) also incorporates the factor of cohesion, but was not included as the research did not contain responses to match this factor.

Conclusion

In conclusion, this study showed that the psychological challenges relevant to mental toughness faced by student athletes offered valuable insight into the underlying factors of mental toughness. General descriptors found in the study mapped across factors not limited to a single model of mental toughness, highlighting that no singular model encapsulates mental

toughness accurately, proposing a six-factor model that integrates two existing models and general attributes of mental toughness.

While further research is needed to expand on this perspective across populations to accurately capture mental toughness in different contexts, there are several implications.

Namely, it suggests an approach to development of mental toughness by mapping relevant factors across models, and using matching factors to identify the appropriate mental toughness strategies.

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Appendix A

Mental Toughness Factors and their Associated Mental Toughness Training Strategies

Factor	Mental Toughness Strategies (Tham & Weigand, 2010)
Goal-Setting	<ul style="list-style-type: none"> • Set positive, S.M.A.R.T. goals for practice and competition. • Write down your step-by-step goals, and remember to celebrate when you achieve them. • Set an end-of-season outcome goal at the end of each season. • Identify key performance attributes necessary for your success. • Develop a performance profile. • Use interval goal-setting to establish challenging yet realistic goals. • Set short-term practice goals to help you bridge the performance gap. • Set process goals during competitive performance.
Imagery	<ul style="list-style-type: none"> • Have a conducive environment for daily imagery practice. • Improve your vividness and controllability of your images through more practice. • Use sport performance videos to practice imagery regularly. • Use mental rehearsal to improve your skills while eliminating errors. • Use mental rehearsal to improve your skills while eliminating errors. • Practice. Practice. Practice (Mentally, that is). • Evaluate the quality of your imagery practices regularly.
Self-Talk	<ul style="list-style-type: none"> • Use cue words to master your sports skills. • Be aware of your own internal dialogue. • Your self-talk should always focus on what you want, not on what you don't want. • Change your negative thoughts into positive ones during stressful situations. • Overcome your irrational beliefs. • Use positive affirmations to help you achieve your sporting goals and objectives. • Create a list of inspirational quotations to motivate and encourage yourself.

(continued)

Factor	Mental Toughness Strategies (Tham & Weigand, 2010)
Composure	<ul style="list-style-type: none"> • Learn and regularly practice progressive relaxation. • Use centering to calm yourself quickly. • Learn not to think of the outcome or result in the midst of sporting performance. • When outside of your "zone," use imagery to facilitate composure • When outside of your "zone," use positive self-talk to facilitate composure • When outside of your "zone," use music to facilitate composure. • When outside of your "zone," act or behave in ways that get you back in.
Concentration	<ul style="list-style-type: none"> • Focus on process-oriented tasks that are within your control. • Mentally rehearse your event concentration. • Use reminders to help you focus your attention. • Establish a consistent pre-performance routine. • Forget the past, ignore the future. • Prevent choking through relaxed focus. • Avoid over-analyzing your skills. Trust more. Let things happen.
Confidence	<ul style="list-style-type: none"> • Be well-prepared and accumulate enough practice time. • Imagine success. • Keep a positive self-image. • Think confidently. • Act confidently- no matter what happens. • Have a plan of attack. • Evaluate your confidence levels regularly.
Coping with Challenges	<ul style="list-style-type: none"> • Expect the unexpected. • Do simulation training. • Balance stress with recovery. • Have a well-planned competition routine. (Part 1): Pre-competition phase. • Have a well-planned competition routine. (Part 2): Competition phase. • Have a well-planned competition routine. (Part 3): Post-competition phase. • Apply mental toughness strategies to facilitate the injury recovery process.