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SciVerse ScienceDirect

Journal of Sport and Health Science 2 (2013) 184–192

www.jshs.org.cn

Original article

Moderating variables in the relationship between mental toughness and performance in basketball

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Received 2 May 2012; revised 15 July 2012; accepted 15 August 2012

Abstract

Purpose: This study explored the relationship between mental toughness and college basketball performance, specifically examining possible moderating variables (gender and starting status).
Methods: Male and female (n = 197) college basketball players completed the Psychological Performance Inventory-Alternative (PPI-A), a measure of characteristics and skills consistent with mental toughness, and the PERF, an objective measure of basketball performance.
Results: Findings suggest that basketball performance can be partially predicted by mental toughness and starting status. Males reported greater mental toughness than females. Starters and nonstarters did not differ in mental toughness. Moderated hierarchical regression analysis indicated that mental toughness was related to performance for male players as both a main effect and interaction with starter status. For female players, in contrast, starter status was the only significant predictor of performance. Practitioners are encouraged to foster the psychological skills associated with mental toughness in females and non-starters in basketball.
Conclusion: Discussion of the PPI-A as a measure of mental toughness and suggestions for its improvement are explored. A need exists for additional research on mental toughness and objective performance, as performance enhancement is a major impetus for research on mental toughness.

Keywords: Basketball; Mental toughness; Moderating variables; Performance; Psychological Performance Inventory-Alternative; Psychological skills

1. Introduction

Early research on mental toughness indicated that 82% of wrestling coaches identified mental toughness as the most important prerequisite to competitive success.[1] In support of this research, athletes, media personnel, and coaches regularly characterize successful performers as being mentally tough. While the term mental toughness is frequently used colloquially to describe athletic success, empirical support for the relationship between mental toughness and performance success has not been fully established. Given the pointed focus of this study on the relationship between mental toughness and performance, a full review of mental toughness literature is beyond the scope of this article. However, relevant conceptual discussion and measurement issues will be addressed.

Among the issues in forming a solid construct are theoretical basis, definition and conceptualization, and measurement. A social-cognitive theoretical approach has been suggested when investigating the topic of mental toughness given the social and cognitive processes involved in achieving mental toughness. Scholars have conceptualized mental

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Peer review under responsibility of Shanghai University of Sport

Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.jshs.2012.09.002

toughness in a variety of ways and, in general, the definitions lack consistency. A focused and precise definition of mental toughness has been a topic of much debate among researchers. Jones et al.[2] defined mental toughness as a psychological quality that helps in coping with sport pressures and allows athletes to be consistently resolute in demonstrating psychological skills such as focus, motivation, confidence, and control. Middleton et al.[3] interviewed athletes from a variety of sports and proposed that mental toughness is strong determination in the face of adversity. Clough et al.[4] used four C's to describe mental toughness. They have suggested that challenge, commitment, control, and confidence are central to mental toughness. While variability among the definitions exists, mental toughness appears to relate to the skillful demonstration of a collection of psychological skills.

Bull et al.[5] have suggested that the characteristics of mental toughness in a global sense might be distinct from how it is understood in a particular sport. Similarly, it is possible that the constituents of mental toughness differ in particular sports. For instance, mental toughness in rugby may be distinct from mental toughness in swimming. Both Bull et al.[5] and Thelwell et al.[6] in studying mental toughness in cricket and soccer respectively, found that the sport-specific definitions proposed by coaches and athletes were in line with the global definition of mental toughness created by Jones and colleagues.[2] Gucciardi et al.[7] created a sport-specific definition of mental toughness for Australian football after interviews with 11 male coaches in the Western Australian Football League. Their definition also implies that several psychological skills are necessary for an athlete to be mentally tough. Specifically, according to Gucciardi et al.[7] mental toughness encompasses one's collective beliefs (encompassing attitudes, values, behaviors, and emotions) which help in overcoming barriers to success. While proposed definitions of mental toughness differ slightly in syntax, the essence of mental toughness appears to be the same: psychological resoluteness and positive coping in the face of the demands of the sporting context. The current study was informed by the general definition provided by Jones et al.[2] as well as the work of Gucciardi et al.[7] who added specificity in relation to the psychological attributes of mental toughness.

A multitude of measures have been proposed to measure mental toughness in sport. In recent years several general (Psychological Performance Inventory, PPI;[8] Psychological Performance Inventory-Alternative, PPI-A;[9] Mental Toughness Questionnaire, MTQ;[4] Sports Mental Toughness Questionnaire, SMTQ[10]) and sport-specific (Australian football Mental Toughness Inventory, AfMTI;[11] Cricket Mental Toughness Inventory, CMTI[12]) instruments have been employed in the literature. However, none of these measures purporting to examine mental toughness have satisfied all the rigorous construct validation principles deemed necessary for the development of sound instrumentation.[13] For example, a measure may display satisfactory factorial validity, but lack face or external validity. Even when validity criteria have been satisfied, a measure that is not grounded in theory may fail to adequately inform researchers why particular components are included (or not) in the measure. Given the paucity of adequate measures in the current literature[14] the PPI-A was selected for use in this study based on its item brevity (14-items), heuristic appeal, and factorial validity.[15]

The PPI-A is a revised version of Loehr's[8] original 42-item Psychological Performance Inventory, which has been used in a number of studies related to psychological performance skills and mental toughness.[16–20] Loehr[8] described mental toughness with characteristics such as refusal to be intimidated, unyielding attitude when beaten, retaining optimal arousal, and eagerness to compete. Based on interviews Loehr devised a 7-factor structure which included self-confidence, negative energy control, attention control, visualization and imagery control, motivation, positive energy, and attitude control. Loehr used the PPI to both evaluate mental skills and discern levels of mental toughness. Commonalities exist between Loehr's ideas and the definition proposed by Jones and colleagues.[2] For instance, an unyielding attitude when beaten[8] suggests that coping strategies[2] following stressful events are used by an athlete. Also, the inclusion of factors dealing with control, motivation, and self-belief[8] is similar to remaining in control, determined, and confident.[2] Subsequent studies exploring the factor structure of the PPI[9,21] indicated a need for re-evaluation of the measure. Therefore, Golby et al.[9] explored the factor structure of the PPI and created an alternative measure called the PPI-A.

Gucciardi et al.[22] have suggested that, rather than being a measure of mental toughness, the PPI-A may be better conceptualized as an assessment of characteristics and skills consonant with mental toughness. The factor structure of the PPI-A captures many of the core elements of mental toughness as articulated by Jones et al.[2] and Gucciardi et al.[7] Specifically, it measures psychological skills that are indicative of mental toughness such as, the athlete's resolve and commitment to their sport, sustained confidence in themselves, control of their energy and attitude, ability to regulate their thoughts and energy, and use of visualization skills in practice and competition. Although this factor structure does not contain an element specifically named control, the essence of control is captured by several factors. For example, positive cognition includes controlling negative thoughts and redirecting focus. Intuitively, control encompasses the ability to manage emotions and attitudes. Also, Golby et al.[9] have suggested that self-belief includes self-regulatory feelings, which is a part of control.

While it is presumed that athletes who perform better are more mentally tough, research has tended to tangentially address athlete performance, and findings have been somewhat equivocal. For example, using the Mental Toughness Questionnaire 48 (MTQ48), Crust and Clough[23] reported a positive association between mental toughness and the time a weight could be suspended in a sample of undergraduate students. Golby et al.[17] along with Kuan and Roy[18] reported that rugby and Wushu athletes, respectively, at higher levels of competition were more mentally tough than their less skilled peers. However, these findings are limited because of measurement issues, the noted differences in mental toughness between