

The Relationship Between Mental Toughness and Academic Achievement and Its Relevant Factors

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ABSTRACT

Mental toughness (MT) refers to an ability to recover, and even gain strength and growth, allowing individuals to adapt positively to their environment. MT has a positive and protective effect on overcoming adversity and achieving long-term goals. MT is closely related to good personality traits, such as, positivity, optimism, and self-confidence. These traits can directly contribute to the improvement of students' MT levels. Current research on the relationship between mental toughness and achievement has focused on sports, i.e., most of the research has focused on athletic training for elite athletes, and little research has been conducted on other aspects, such as, academic achievements. Mental toughness helps people have the courage and confidence to face adversity and internalize it for self-growth. Several previous studies showed that academic achievement is significantly associated with MT. Mental toughness training and enhancement can be done through positive thinking training. However, it is not clear that whether academic achievement can be improved through MT interventions. The existing research has shortcomings, such as, relevant comparisons without adequate longitudinal studies, narrow research areas, and no studies on mediating factors between MT and academic achievement. Future researchers may benefit from exploring its application in other domains, as well as effective interventions or important influences.

Keywords: *Mental toughness, Academic achievement, Growth mindset, Mindfulness*

1. INTRODUCTION

Since the mid-19th century, developmental psychologists and child psychologists have been attempting to establish a correlation between childhood experiences and individual's future development. The majority of studies have illustrated that there exists an association between adverse childhood experiences and future risks, including depressive disorders, anxiety disorders, and smoking [1-3]. However, studies have also demonstrated that not all people with adverse childhood experiences necessarily encounter such adversity in adulthood. It is thought that one of the reasons accounting for this is what psychologists call Mental Toughness. Mental toughness refers to an attitude that allows a person to recover and grow despite trials or hardships [4]. By clarifying that mental toughness represents the mental attitude of recovering from situations, such as trials or hardships, and that mental toughness can change according to different goals, researchers can examine the calibration between mental toughness and objective indicators to make best use of the concept of mental

toughness whose validity is particularly noteworthy in that mental toughness is believed to have the potential to learn and improve, and it is a trait that is effective for learning and constant growth, protecting the public from work-related trauma [5]. The concept of mental toughness has mostly been employed in sports, but has since been extended to other domains such as military personnel and left-behind children, and research has demonstrated that mental toughness as a mediating variable directly have an impact on retention experiences and well-being, as well as the relationship between childhood traumatic experiences and depressive mood control [4, 6, 7]. For example, mental toughness can reduce later emotional trauma resulted from adverse childhood experiences and enhance subjective well-being of college students, thereby improving quality of life [8]. Current research concentrates on mental toughness in conditions such as loss, bereavement, depression, anxiety, stress, and pain. These studies demonstrate that mental toughness has both a positive and protective impact on overcoming adversity and obtaining growth [9-11].

Based on previous literature, the attributes of mental toughness can be summarized as following: unshakeable confidence in one's own abilities; internalized motives to succeed; capability to recover from performance setbacks; capability to focus on personal life; sufficient mental control. In the second study by Jones et al., they reported four different dimensions of mental toughness, attitude (mindfulness and focus), training (daring to push the limits), competition (improving mindfulness and stay focusing) and post-competition (dealing internally with the results of failure or success) [4]. They adopted the MT48 questionnaire to measure not only overall mental toughness, but also included measures of various subscales (commitment, challenge, control, and confidence), making specific components of mental toughness specific to the target being measured [12].

In contrast, the consequences of the data in Gucciardi et al.'s five studies suggest that the one-dimensional model is considered to be an adequate match for the data. The series of studies reported in this article were designed to test these three substantive issues across several achievement contexts, including sport, education, military and the workplace [13]. Collectively, the results of these studies also revealed that mental toughness may be best conceptualized as a one-dimensional rather than a multidimensional concept; plays an important role in performance, goal pursuit, and thriving despite stress; and can vary and have enduring properties across situations and time.

Current research on the link between mental toughness and success mainly concentrate on the field of sports. One drawback of applied research on the mental toughness model is the domain issue. Most of the research studies fall on sports training, and to date, the use of mental toughness concepts or training application aspects has become higher in sports and less relevant for other people or specific age groups. Other relevant factors that affect overall performance like academic performance are personality traits such as perseverance, or self-belief. These traits are long-lasting and cumulative and help people to achieve or succeed in certain areas [14]. However, there is very little literature or research on the relationship between MT and academic achievement. Future researchers may therefore benefit from exploring its application in other domains. Therefore, this article will explore the correlation between MT and academic performance and effective ways or important factors to intervene to develop more suitable interventions.

2. THE IMPACT OF MENTAL TOUGHNESS ON ACADEMIC ACHIEVEMENT AND RELEVANT FACTORS

If a person who is not strong in MT fails or experiences a setback, it may affect his academic

performance or classroom behavior in school, and thus he or she will not be able to continue to master more knowledge and skills. As a personality trait or psychological process, MT may have an impact on adolescent students' academic performance and behavior in school. In three studies carried out by St Clair-Thompson et al., they investigated the associations between academic achievement and school attendance, classroom behavior and peer interpersonal relationships, and mental toughness in a sample of 11–16-year-olds [15]. The consequences of the first study indicated that challenge, commitment, and control in mental toughness were significantly related to student achievement and attendance, with data from regression analyses of MTQ48 scores on students' achievement demonstrating that the crucial component was expressed in the control over life. The results of Study 2 depicted a significant inverse relationship between several aspects of mental toughness (commitment, control, interpersonal trust, and total mental toughness) and students' negative behavior in the classroom. In Study 3, competence confidence, interpersonal confidence, overall confidence, and mental toughness were significantly correlated with the social acceptance self-perceptions. Their studies showed that MT is a construct that is strongly related to several aspects of education, such as grades and attendance, i.e., students with higher levels of MT have higher grades and attendance.

Second, MT not only has a psychological effect on adolescents and children, but also it is very likely to have a long-term impact on the subsequent stages of development. For college students or working people, the role of MT may also be indispensable. Lin et al. explored the relationship between MT and academic performance and attendance in a sample of UK university students [16]. The sample participants were composed of college students between the ages of 21 to 36. They required participants to complete the MTQ48 questionnaire (description of the MT48 instrument: Challenge, Control, Commitment, and Confidence). Eventually, the correlation analysis was made between the total average score of students in three years and the total score of MT. The results of the study1 illuminated a positive correlation between MT and academic performance during higher education. Study2 by Lin et al. examined the correlation between MT and job income in a sample of working participants. The results revealed that for individuals of the same age and gender, mentally tougher individuals turned to have higher academic performance as well as higher incomes.

As the above studies only suggest a correlation between MT and academic performance, it remains unclear whether MT plays a crucial role in academic achievement or not over time. A longitudinal study by Papageorgiou et al. clarifies this crucial relationship [17]. Researchers searched for high school students aged 14-21 for their study and longitudinally explored the

relationship between MT, narcissism, and achievement. Ten-item Mental Toughness Questionnaire (MTQ-10) has been adopted to assess total MT of students. And the Short Dark Triad questionnaire (SD3) assesses subclinical narcissism, subclinical psychopathy and machiavellianism. Students reported their academic performance at the end of the first semester (wave1) and that of the second semester (wave2). MT at wave 1 was associated significantly with school achievement at wave1 and wave2. The findings implies that although narcissism does not affect academic performance directly, mental toughness is positively associated with subclinical narcissism and that high narcissism may indirectly contribute to positive school achievement through MT. Because MT plays a mediating role in this process, it not only has a direct impact on academic achievement, but can also be a mediating factor for personality traits to influence academics.

In addition, based on the studies that MT has direct effects, it may also have indirect effects, such as sleeping. Brand et al. investigated the relationship between MT and sleep quality in adolescents [18]. The investigators selected some adolescents as experimental participants, who were divided into high-intensity and low-intensity groups. Participants completed the MTQ48 to assess MT, the Insomnia Severity Index to assess SC, and the Epworth Sleepiness Scale to assess DS. And they also underwent objective sleep EEG monitoring, which provides the evaluation of total sleep time, sleep efficiency, sleep onset latency, stages 1-4 (minutes and percentage), light sleep (Stages 1 and 2), slow wave sleep (Stages 3 and 4), rapid eye movement (REM) sleep, and number and times of awakenings after sleep onset. As a consequence, it is thought that the high MT group slept longer, woke up less often after sleep onset, slept less lightly and slept more deeply, compared with the low MT group, and they also exhibited lower levels of daytime sleepiness. Therefore, by enhancing MT can effectively enhance sleep quality and sleep duration. For academic achievement, the quality of sleep is a decisive factor to maintain focus and mental clarity. Studies by van der Heijden et al. examined the relationship between long-term sleep loss, subjective sleep quality, and knowledge of sleep hygiene and academic performance [19]. Overall, chronic sleep deprivation was associated with academic achievement and concentration in higher education. Lack of knowledge about sleep hygiene was moderately associated with poorer academic performance. Above studies have supported that MT can promote the quality of sleep for adolescents, improving academic performance.

Finally, the concept of perfectionism sets goals that are often too high or unrealistic for people, and then people must make relentless efforts to meet those standards and measure self-worth independently, leading to self-criticism when standards are not met [20]. Perfectionism presupposes that one must do better, in

which case perfectionism will inevitably affect people's long-term development and may lead to people not being able to change or improve themselves if they are under stress. There is an overlap between MT and perfectionism, so the disparity between MT and perfectionism is worth to be explored. Danielle et al. examined how outstanding female athletes perceive and experience mental toughness and self-compassion and their correlation in the pursuit of athletic success and stress management. They conducted two semi-structured interviews with participants aged 22 - 34 years. Through thematic analysis, they identified and analyzed patterns in the data related to how athletes experience and perceive self-compassion and mental toughness. It is referred that women the perception of self-compassion and mental toughness of women is a compatible and contextualized process. Self-compassion is critical to the development of mental toughness, and positive thinking is the key to developing and maintaining self-compassion and mental toughness [21]. As MT has an inseparable relationship with self-compassion, it has a distinguish effect on academic performance compared to perfectionism.

3. EFFECTIVE INTERVENTIONS FOR MENTAL TOUGHNESS

Mindfulness is a clinical therapy in psychology. In contrast to the usual unconscious state of people, mindfulness training aims to train people to focus on the present moment, such as a sensation in the body, without being inexplicably influenced by unconscious or subconscious thoughts. Ajilchi et al. investigated the feasibility and effects of a positive thinking training program on the mental toughness and emotional intelligence of amateur basketball players [22]. The survey participants constituted some male amateur basketball players from Irlande and they were randomly assigned to the experimental and control groups (15 each). The investigators were measured using the Positive Exercise Scale, Mental Toughness (MT) Questionnaire, and Emotional Intelligence Questionnaire. They used the Mindful Sport Performance Enhancement (MSPE): a 6-week program consisting of weekly 90-min group sessions and home practice. Participants progressed from sedentary to active mindfulness with sports-specific mindfulness. After the training, the intervention group scored higher on the Positive Thinking than the control group significantly. As a consequence, it can be inferred that these exercises can boost athletes' positive thinking in training, facilitating athletes' MT and emotional intelligence. Since mindfulness can improve MT, future research can further explore whether academic performance will also be improved after strengthened MT.

Secondly, growth mindset contributes to fostering a psychologically safe learning environment, so for this

kind of mindset training, such as mindfulness, there is also a great possibility to improve the intensity of MT [23]. With the growth mindset, people may believe in their potential and see failure as an opportunity to discover and overcome weaknesses.

A study by Golby and Wood examines the effectiveness of psychological skills intervention (PST) in the improvement of the mental toughness and mental health of student athletes [24]. Over the course of the six-month intervention, the athletes were required to record their physical and psychological preparations, progress, general thoughts and concerns in a personal logbook. Athlete students were then encouraged to engage in self-talk (to effectively monitor possible negative thoughts); thought stopping (to inhibit athletes from making negative cues or stopping useless guesses); thought control (to confront their consciousness and increase positive self-cues); concentration skills and focus (help get "in the zone"); expecting success and positive imagery (coping and mastery imagery). The results illuminated that there was a significant positive correlation between the MT components and each active measure. Thereby, one of the directions worth studying in the future is to improve MT through growth mindset or PST, thus indirectly affecting academic performance.

4. LIMITATION AND FUTURE DIRECTION

The existing studies are mainly correlational studies of MT changes, and there could be more longitudinal studies in the future, i.e., they could track different changes in different mental stages. Second, there are no studies on the effects of MT interventions on academic achievement, and specific intervention studies based on the components of MT would be more meaningful for the future. Finally, although many studies have discussed the mediating role of MT, many other psychological factors or psychological processes are uncovered. For example, it is unclear that the effect of MT on academic performance is related to self-esteem or emotional stability. Therefore, the research area is rather limited, and the only existing mediator is the sleep quality, but its direct relationship with academic performance has not been explored.

5. CONCLUSION

Numerous studies have shown that MT is a construct that is closely related to several aspects of academic achievement, personality traits, etc. At the same age and gender, individuals with higher levels of MT are likely to exhibit higher academic achievement and excellent attendance and classroom behavior. Second, chronic sleep deprivation affects students' academic achievement and attention, and elevating the intensity of MT can

improve adolescents' sleep quality, thus enabling them to focus on the classroom and improve school performance.

In terms of MT interventions, through thematic analysis, research has shown that self-compassion is critical to the development of mental toughness, and positive thinking not only fosters and maintains self-compassion, but also improves MT. Future research could focus on whether the relationship between several of these factors can also have an impact on academic achievement.

REFERENCES

- [1] Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders*, 82(2), 217–225.
- [2] Reiser, S. J., McMillan, K. A., Wright, K. D., & Asmundson, G. J. G. (2014). Adverse childhood experiences and health anxiety in adulthood. *Child Abuse & Neglect*, 38(3), 407–413.
- [3] Anda, R. F., Croft, J. B., Felitti, V. J., Nordenberg, D., Giles, W. H., Williamson, D. F., & Giovino, G. A. (1999). Adverse childhood experiences and smoking during adolescence and adulthood. *JAMA: Journal of the American Medical Association*, 282(17), 1652–1658.
- [4] Jones, G., Hanton, S., & Connaughton, D. (2002). What is this thing called mental toughness? An investigation of elite sport performers. *Journal of Applied Sport Psychology*, 14(3), 205–218.
- [5] Thompson, S. R., & Dobbins, S. (2017). The Applicability of Resilience Training to the Mitigation of Trauma-Related Mental Illness in Military Personnel. *Journal of the American Psychiatric Nurses Association*, 1-12.
- [6] Clough, P., Earle, K., & Sewell, D. (2002). *Solutions in sport psychology*. London: Thomson.
- [7] Thompson, S. R., & Dobbins, S. (2017). The Applicability of Resilience Training to the Mitigation of Trauma-Related Mental Illness in Military Personnel. *Journal of the American Psychiatric Nurses Association*, 1-12.
- [8] Ouyang, L., Zhang, X. J., Wang, L. Y., Hu, C. Y., Li, F. L., & Wang, C. C. (2017). The relationship between psychological toughness and life satisfaction of college students. *Chinese School Health*, 38(4), 554–557+561.
- [9] Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of

- depressive disorders in adulthood. *Journal of Affective Disorders*, 82(2), 217–225.
- [10] Davydov, D. M., Stewart, R., Ritchie, K., & Chaudieu, I. (2010). Resilience and Mental Health. *Clinical Psychology Review*, 479–495.
- [11] Novotny, J. S. (2011). Academic Resilience: Academic Success as Possible Compensatory Mechanism of Experienced Adversities and Various Life Disadvantages. *The New Educational Review*, 74–84.
- [12] Crust, L. (2008). A review and conceptual re-examination of mental toughness: Implications for future researchers. *Personality and Individual Differences*, 45(7), 576–583.
- [13] Gucciardi, D. F., Hanton, S., Gordon, S., Mallett, C. J., & Temby, P. (2015). The concept of mental toughness: Tests of dimensionality, nomological network, and traitness. *Journal of Personality*, 83(1), 26–44.
- [14] Hartley, M. T. (2011). Examining the Relationships Between Resilience, Mental Health, and Academic Persistence in Undergraduate College Students. *Journal of American College Health*, 596–604.
- [15] St Clair-Thompson, H., Bugler, M., Robinson, J., Clough, P., McGeown, S. P., & Perry, J. (2015). Mental toughness in education: Exploring relationships with attainment, attendance, behaviour and peer relationships. *Educational Psychology*, 35(7), 886–907.
- [16] Lin, Y., Clough, P. J., Welch, J., & Papageorgiou, K. A. (2017). Individual differences in mental toughness associate with academic performance and income. *Personality and Individual Differences*, 113, 178–183.
- [17] Papageorgiou, K. A., Malanchini, M., Denovan, A., Clough, P. J., Shakeshaft, N., Schofield, K., & Kovas, Y. (2018). Longitudinal associations between narcissism, mental toughness and school achievement. *Personality and Individual Differences*, 131, 105–110.
- [18] Brand, S., Gerber, M., Kalak, N., Kirov, R., Lemola, S., Clough, P. J., Pühse, U., & Holsboer-Trachsler, E. (2014). Adolescents with greater mental toughness show higher sleep efficiency, more deep sleep and fewer awakenings after sleep onset. *Journal of Adolescent Health*, 54(1), 109–113.
- [19] van der Heijden, K. B., Vermeulen, M. C. M., Donjacour, C. E. H. M., Gordijn, M. C. M., Hamburger, H. L., Meijer, A. M., van Rijn, K. J., Vlak, M., & Weysen, T. (2018). Chronic sleep reduction is associated with academic achievement and study concentration in higher education students. *Journal of Sleep Research*, 27(2), 165–174.
- [20] Osenk, I., Williamson, P., & Wade, T. D. (2020). Does perfectionism or pursuit of excellence contribute to successful learning? A meta-analytic review. *Psychological Assessment*, 32(10), 972–983.
- [21] Wilson, D., Bennett, E. V., Mosewich, A. D., Faulkner, G. E., & Crocker, P. R. E. (2019). “The zipper effect”: Exploring the interrelationship of mental toughness and self-compassion among Canadian elite women athletes. *Psychology of Sport and Exercise*, 40, 61–70.
- [22] Ajilchi, B., Amini, H. R., Ardakani, Z. P., Zadeh, M. M., & Kisely, S. (2019). Applying mindfulness training to enhance the mental toughness and emotional intelligence of amateur basketball players. *Australasian Psychiatry*, 27(3), 291–296.
- [23] Spitzer, B., & Aronson, J. (2015). Minding and mending the gap: Social psychological interventions to reduce educational disparities. *British Journal of Educational Psychology*, 85(1), 1–18.
- [24] Golby, J., & Wood, P. (2016). The effects of psychological skills training on mental toughness and psychological well-being of student-athletes. *Psychology*, 7(06), 901.