



The Relationship between EFL Learners' Mental Toughness and Critical Thinking

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Abstract

Mentally tough learners are conceptualized as being able to function effectively in stressful situations and recent research has focused on the correlation between mental toughness and critical thinking of EFL learners. A very limited number of studies have thus far examined the possibility that mentally tough learners are lower critical thinkers. This paper tested the relationship between mental toughness and critical thinking ability of EFL learners to determine whether mentally tough learners generally experienced more or less critical thinking issues. The participants (112 consisting of 55 men and 57 women aged between 18 and 35 years) completed the MTQ48 (Clough, Earle, & Sewell, 2002) and Critical thinking test (Ricketts, 2003). Mental toughness and critical thinking ability are significantly correlated in the way that an increase in one of them causes growth in the other. The results showed that there is a statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their gender-based on which females outperformed males. The results of the ANOVA test also showed that there is not any statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their field of study.

Keywords:

Mental Toughness, Challenge, Commitment, Control of Emotion, Control of Life, Confidence in Abilities, Interpersonal Confidence, Critical Thinking

1. Introduction

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Educators have long known that attending school and academic success do not grow a graduate student who is an effective thinker in diverse situations. There is an odd propensity for rigorous thinking to stick to specific models or kinds of issues. In this way, a learner may have figured out how to appraise the response to a math issue before starting calculations as a method for checking the exactness of his response, yet in the chemistry lab, the same learner calculates the elements of a compound without seeing that his appraisals entirety to more than 100 percent.

The historical backdrop of studies on thinking relies on the time that individuals perceived that they think. Thinking is one of the highlights that recognize people from other living creatures. Thinking is the control or change of some internal portrayal ([D. F. Halpern, 2013](#)). She claims that when we begin thinking, we utilize our knowledge to accomplish some targets. Therefore, thinking ability is the fundamental capability of our life since we need to achieve our goals and to have relations in the public. Descartes contended that thinking is mainly the reasoning, and that reasoning is a chain of basic thoughts connected by applying exact principles of rationale ([McGregor, 2007](#)). His discoveries, with respect to neurological transmissions, among receivers and effective factors in different vertebrates drove him to proclaim 'cogito ergo sum', which interpreted as I think subsequently I am ([Müller, 2005](#)). Both acts of learning and thinking are the ideas that bolster and complete each other.

At this point, ([Güven & Kürüm, 2008](#)) claimed that while learning style and critical thinking ideas have various qualifications, this can be said that these can be utilized together. When the term Critical Thinking is looked at, it is comprehended that there are implications of it which are mainly proposed and used in philosophy and psychology sciences while in general, the term lacks a clear definition. McGregor ([McGregor, 2007](#)) claimed that 'Critical', a Greek word meaning to judge, emerged off the analysis and argument, proposed by Socrat, refer to thinking and then the word Kritikos, a Latin word meaning to discern or to judge that is the sort spreading to the world languages. When learners are asked to think critically, they are urged to have an independent mind, to think for themselves, to address speculations, to break down components, to incorporate the conditions, to go beyond by proposing new theories and testing them against the realities. Questioning is the foundation of critical thinking which thusly is the wellspring of knowledge arrangement and therefore ought to be instructed as a system of learning. According to Sharma and Elbow ([Sharma & Elbow, 2000](#)) in teacher-centered and textbook-driven contexts, learners are not allowed to deal with this kind of learning. This circumstance is an upsetting case for contemporary instructors, and therefore they would prefer to pick the most recent models and strategies which are progressively viable in guiding learners to think. As it was mentioned by ([Hader, 2005](#)) thinking critically will improve creativity and upgrade the manner in which you utilize and deal with your time. Critical thinking not only portrays the capability to think in line with the standards of rationale and logic but also the capacity to apply these abilities to genuine and authentic issues which are not content-independent. Critical thinking can give you an increasingly insightful comprehension of yourself and offer you the chance to be objective.

Critical thinking is a deep and rational thinking that makes individuals capable of making decisions on complex issues related to phenomena as well as analyzing them. ([Paul, 1995](#)) provided the definition of critical thinking as "A unique and purposeful thinking in which the thinker systematically and habitually imposes criteria and intellectual standards upon the thinking, taking charge of the construction of thinking, guiding the construction of the thinking according to [critical thinking] standards, and assessing the effectiveness of the thinking according to the purpose, criteria, and the standards [of thinking] (p. 21). According to ([D. F. Halpern, 2013](#)) critical thinking is "thinking that is purposeful, reasoned and goal-directed. It is the kind of thinking involved, in solving problems, formulating inferences, calculating likelihoods, and making decisions" (p. 5). ([Rudd, Baker, & Hoover, 2000](#)) provided another description of critical

thinking as “a reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which an incontrovertible solution is unlikely” (p. 5) and as it was mentioned by ([D. Halpern, 2003](#)) critical thinking is “our active, purposeful, and organized efforts to make sense of our world by carefully examining our thinking, and the thinking of others, in order to clarify and improve our understanding” (p.29).

Critical thinking, by identifying and evaluating phenomena, focuses on examining their impact on life and solving problems in a way that makes the phenomenon or topic more easily understood and understood by users ([Kaur, 2019](#)). ([Bensley, 1998](#)) believed that you can improve your critical thinking skills by practicing and identifying in different situations. ([Facione & Facione, 2007](#)) mentioned that individuals with different abilities and tendencies have always tended to search for and understand the facts and are patiently exploring and understanding them, while carefully analyzing and examining issues, ordering their perceptions. Critical thinking can, therefore, be said to be a rational way of looking at and reconsidering beliefs, opinions, and decisions about issues based on evidence and evidence. ([Hariri & Bagherinejad, 2012](#)) observed undergraduate and postgraduate students and represented that critical thinking is poor at all levels and this requires a greater emphasis on teaching critical thinking skills at the university level. ([Ricketts, 2003](#)) defined three elements of Innovativeness, Maturity, and Engagement instead of seven factors of TruthSeeking, Open-mindedness, Analyticity, Systematicity, Self-confidence, Inquisitiveness, and Maturity used by ([Giancarlo & Facione, 2001](#)) as:

- Innovativeness: “The Innovativeness disposition measured students’ predisposition to be intellectually curious and wanting to know the truth.
- Maturity: “Maturity disposition measured students’ predisposition to being aware of the complexity of real problems; being open to other points of view; and being aware of their own and others biases and predispositions.
- Engagement: The Engagement disposition measured students’ predisposition to looking for opportunities to use reasoning; anticipating situations that require reasoning; and confidence in reasoning ability” (p.15).

Moreover, one can referred to personal and cognitive characteristics which may affect individuals’ level of thinking. ([Marchant et al., 2009](#); [St Clair-Thompson et al., 2015](#)) and ([Stamp et al., 2015](#)) referred to a personality construct that has been explored concerning mental health, organizational and educational outcomes namely Mental Toughness (Eissa, Almthen, & Zourob). MT, has become popular since the last decade, is defined by ([Clough et al., 2002](#)), and ([J. G. Jones & Moorhouse, 2008](#)) as a multidimensional personality construct that allows the person to stay calm facing with challenging situations. It activates some positive psychological and mental resources that influence how an individual assesses and reacts to challenging situations in order to accomplish his goals ([Gucciardi, Gordon, & Dimmock, 2009](#)). According to ([G. Jones, 2002](#)) mental toughness has been considered as one of the most applied, but least comprehended terms in applied psychology. Even though MT has always known as one of the most useful elements in practical sport psychology, it has always been one of the most unknown elements as well ([G. Jones, 2002](#)). Nevertheless, a developing increase in interest, and more accurate and strict researches on Mental Toughness, one of the most important elements in sport, resulted in more clearness about this significant subject ([Crust, 2007](#)).

([Crust, 2008](#)) and ([Mathers, 2009](#)) agreed that mental toughness is a multidimensional construct which focuses on some vital psychological concepts while ([G. Jones, Hanton, & Connaughton, 2007](#)), and ([Gucciardi et al., 2009](#)) mentioned that there are basic differences in factors provided in new models of mental toughness. A model of mental toughness that is proposed by ([Clough et al., 2002](#)) offers probably the most theory-based. In their 4C’s model, they conceptualized mental

toughness as an existing theory extracted from the health psychology domain. (Clough et al., 2002) found that their study on mental toughness uncovered a construct that represents hardiness which is an important psychological variable that has been appeared to separate those who become sick from those who remain healthy or flourish in stressful conditions (Kobasa, 1979). (Clough et al., 2002) suggested that mental toughness is characterized by:

(1) control (both emotional and life) mirrors a propensity to feel and act as if an individual is authoritative,

(2) commitment concerns profound objective inclusion

(3) challenge refers to the extent to which an individual considers problems as opportunities for his own development rather than threats, and

(4) confidence (both in abilities and interpersonal) mirrors an individual's sense of self-belief and conviction a resolute faith in having the capability to gain success while not being frightened of associating with others.

Confidence, the fourth component, is the one that has been reliably reported as the foundation of mental toughness. (Clough et al., 2002) proposed a measurement instrument for mental toughness namely the Mental Toughness Questionnaire (MTQ48). The instrument measures components of the 4C's model and its reliability has been measured by (Crust & Clough, 2005) and reported to be good as well as construct validity and criterion validity (Horsburgh, Schermer, Veselka, & Vernon, 2009; Perry, Clough, Crust, Earle, & Nicholls, 2013). The idea of mental toughness was basically correlated to sports and physical-related issues such as pain tolerance (Crust & Clough, 2005), injury rehabilitation (Levy, Polman, Clough, Marchant, & Earle, 2006), perceptions of exertion (Clough et al., 2002), coping effectiveness (Kaiseler, Polman, & Nicholls, 2009), and the use of psychological strategies (Eisenlohr-Moul & Segerstrom, 2013). Then, some researchers have tested mental toughness out of doors of sports activities settings (Crust & Azadi, 2010). For instance, (Marchant et al., 2009) stated that intellectual longevity became notably higher in more senior managerial positions. An extra and crucial finding that emerged right here changed into that mental toughness typically extended with age. This suggests that existing studies might also have a substantial and high-quality effect on the improvement of mental toughness, and opens up the opportunity of targeted intervention strategies. Some other setting where mental toughness has been shown to be beneficial is education.

A recent research by (Crust & Azadi, 2010) represents relationships among mental toughness and educational attainment, college attendance, classroom behavior, and peer relationships. Different reasons can be defined here. First, higher education is, in reality, an environment in which mental toughness ought to play a huge role. For instance, (Eisenlohr-Moul & Segerstrom, 2013) represented that entering a new environment such as university causes a huge amount of stress for both residential and home-based undergraduate students. Theoretically, this can be concluded that mental toughness could be associated with students' progress in higher education. While research concerning instructional performance with character measures has resulted in a few large relationships, there has been one consistent locating. It is obvious that achievement and success are dependent on educational conscience (conscientiousness), a person's moral and ethical sense (Bauer & Liang, 2003; Chamorro-Premuzic & Furnham, 2003). This sense has obvious participation in the component commitment of the MTQ48 model. (Sheard & Golby, 2006) stated that the commitment component of Kobasa's Hardiness Scale (Kobasa, 1979) was certainly correlated with academic achievement. Base on that people are mentally committed to whatever they are doing, so there is the possibility that students have high mental attendance, and applying a great attempt for courses and examinations.

The second reason is that we should expect to observe a correlation between mental toughness and performance is related to (Clough et al., 2002) definition of mental toughness. Another way

to the study of personality and academic achievement is to use specific personality traits. These traits are far more specific in nature than the more generic and wide-reaching global scales such as big five measures. (O'Connor & Paunonen, 2007) identify these as traits that exist at a lower level of personality ranking. Specific traits that have been connected to academic achievement include achievement orientation (Paunonen, 1998), risk-taking (Wolfe & Johnson, 1995) and hardiness (Wolfe & Johnson, 1995). (O'Connor & Paunonen, 2007) concluded that these specific traits are mostly stronger predictors. Mental toughness as defined by (Clough et al., 2002) can be described as specific traits, and as such could be expected to have greater predictive power.

As another reason, one can foresee a noteworthy and positive connection between mental strength and learners' progression. Another reason to anticipate a correlation between mental toughness and scholastic achievement is the set of qualifications of autonomy and responsibility. Different researchers have announced that mentally tough students are more autonomous and that are ready to tackle their own issues (Bull, Shambrook, James, & Brooks, 2005; Crust & Clough, 2011). (Arnsten, 2009) claimed that MT (mental toughness) may impact accomplishment results indirectly through decreasing anxiety and stress. According to (Felsten & Wilcox, 1992), stress impacts subjective working antagonistically and impedes one to perform academically well. (Kaiseler et al., 2009) represented the mentally tough learners use more problem-focused coping strategies and less avoidance (emotion-centered) strategies. The other one is that people who can cope with changes that occur during their life and are able to see this process as a challenge instead of a treat, and persist in adverse and difficult conditions, are mentally strong. As such, there is a significant and positive relationship between spiritual hardness and students' progress. It should be noted in this regard, the relevance of mental toughness to academic achievement is related to some of the characteristics of individuals, such as solving their problems and being responsible for their own development (Bull et al., 2005) that these characteristics are very important in higher education (Felsten & Wilcox, 1992).

Problem-focused managing was connected with more important coping efficiency. Furthermore, MT has been related to learned resourcefulness (the ability to deal effectively with various situations), which is a skill to obtain abilities that promote emotional control and stress management (Cowden, Fuller, & Anshel, 2014). Learners' capabilities have been found to make temperate or reduce the intensity in a significant manner the association between learned or academic stress and academic show (Akgun & Ciarrochi, 2003). In fact, in a running lengthwise study by (Gerber et al., 2013), well-modified or well-fit students, who would have had lower levels of stress, fewer discouraging manifestation, and higher life satisfaction, reported high levels of MT. A positive association has also been shown between MT and psychological welfare among university students who have not received their first degree (Stamp et al., 2015). As such, individuals with a higher level of MT might act better in a field that includes stress and difficulties, in comparison to aware ability- matched peers with lower levels of MT.

(Bull et al., 2005) suggest that one important aspect of MT is tough thinking, and suggest that the most practical manner psychologies focus on developing this aspect. To these researchers, tough thinking symbolize the meaning of more general character and posture into competitive surroundings with mentally tough performers able to apply tough thinking at a crucial moment. Actually supporting vista which appears central to tough thinking, seems to be opposite to the aware venture of individuals with high affect clarity, who tend to over-respond to emotional stimuli (something which quickens a physical or mental process) by hitting things out to adjust in size relative to other parts. It's possible that MT and influence strength may be negatively related, and this assumption or theory was tested in the following research. There is just one investigation that has investigated the relationship between MT and scholarly evaluations and progression in higher education. (Crust et al., 2014) detailed significant and positive relationships between MT,

evaluations, and progression in college students of sports fields. ([Gucciardi, Hanton, Gordon, Mallett, & Temby, 2015](#)) demonstrated that MT was straightforwardly related to higher levels of supervisors's performance.

The purpose of this study was to determine the correlation between mental toughness and critical thinking and then to observe EFL learners' mental toughness and critical thinking. Participants with low levels of mental toughness may have to deal with less critical thinking ability distraction due to characteristically emotion-provoking stimuli. Thus, the ability of mentally tough individuals to remain unaffected by various conditions could in part be explained by having more critical thinking ability, having less cognitive distraction, or having developed or learned more effective coping strategies. If mental toughness and critical thinking are found to be related, then future researchers will have an established theoretical base from which to proceed in evaluating the cognitive operations of mentally tough individuals.

Therefore the research hypotheses are as follows:

Null hypothesis 1: There is not any statistically significant correlation between mental toughness and critical thinking.

Null hypothesis 2: There is not any statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their gender.

Null hypothesis 3: There is not any statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their specific field of study.

2. Methodology

2.1. Participants

The sample consisted of 112 participants (55 men and 57 women) who enrolled for the English BA course (both educating English teachers and educating English translators). A mixed sample was deemed appropriate to more fully study any potential relationships within a broader population. The use of an intact class as the sample appears to be similar to the recent approach taken by ([Nicholls, Polman, Levy, & Backhouse, 2008](#)). The participants' ages ranging from 18 to 35 years. The EFL learners had all been participating in a minimum of one session per week, for 16 sessions.

2.2. Instruments

The MTQ48 ([Clough, 2002](#)) was used to measure the mental toughness of EFL learners. Responses are made to the 48-items on a 5-point Likert scale ranging from "1- strongly disagree", to "5- strongly agree", with an average completion time between 10 and 15 min ([Crust & Clough, 2005](#)). The MTQ48 has an overall test-retest coefficient of 0.9. In this study, the overall Cronbach's alpha for the MTQ48 estimated as 0.86 which was found to be consistent with previous research ([Nicholls et al., 2008](#)). More recently, researchers have reported the MTQ48 to have adequate psychometric properties, and both exploratory and confirmatory factor analysis has been found to support the proposed structure of the inventory ([Horsburgh et al., 2009](#)). ([Clough et al., 2002](#)) Have provided evidence for the construct validity of the MTQ48 with significant relationships reported with optimism, self-image, life satisfaction, self-efficacy, and trait anxiety. In respect of criterion validity, ([Clough et al., 2002](#)) found that participants with self-reported high, as opposed to low mental toughness gave a lower rate of effort during a 30-min physically demanding cycling task.

The Critical thinking test of ([Ricketts, 2003](#)) was used to evaluate learners' critical thinking in three dimensions of innovativeness, maturity, and engagement. This test contains 33 Likert-scale questions and its reliability is reported by ([Pakmehr, Mirdrogi, Ghanaei, & Karami, 2013](#)) as 0.64 for innovativeness, 0.76 for maturity, and 0.71 for engagement. In this study, the overall Cronbach's alpha for the test was 0.72.

2.3. Procedures

An instructor at the university was approached to gain permission to solicit volunteers for the present research. The aims and objectives of the research were briefly stated, and issues of confidentiality were broached. This approach led to 112 volunteers agreeing to participate in this study. All participants read and signed informed consent forms prior to completing a booklet containing a copy of the MTQ48 (Clough, 2002) and the Critical thinking test of (Ricketts, 2003). Completed booklets were placed into envelopes, sealed, and collected by the instructor or the researcher.

2.4. Data analysis

To test the relationship between mental toughness and critical thinking of EFL learners, Pearson Product Moment Correlations were computed between total critical thinking ability (all the three subscales), total mental toughness (the six subscales of the MTQ48 questionnaire). Correlations were also computed to assess any correlation between mental toughness, and critical thinking. Then, ANOVA tests were used to test the data for possible gender differences, and differences related to learners' fields of study. Data screening was used to ensure all dependent variables met the assumptions necessary for the use of parametric statistics.

3. Results Discussion

Null hypothesis 1: There is not any statistically significant correlation between mental toughness and critical thinking. This research aimed to test the hypothesis that mental toughness and critical thinking were significantly correlated or not. Results of the normality test of responses to the MTQ48 and critical thinking questionnaire are presented in Table 1.

Table (1): Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Critical Thinking	.077	112	.099	.989	112	.481
Mental Toughness	.072	112	.200*	.991	112	.641

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Measures of Kolmogorov-Smirnov found the data to be normally distributed. The author used Pearson correlation coefficients to examine the extent to which participants' critical thinking was correlated with MT. The Pearson correlation analysis between overall critical thinking and overall mental toughness represents that there is a moderately significant correlation (Table 2).

Table (2): Correlations

		total.CT	total.MT
Critical Thinking	Pearson Correlation	1	0.398
	Sig. (2-tailed)		.000
	N	112	112
Mental Toughness	Pearson Correlation	.398	1
	Sig. (2-tailed)	.000	
	N	112	112

The analysis revealed that critical thinking was correlated positively and significantly with MT ($r(110) = 0.398$, $p = 0.0000$). Results suggest that mental toughness and critical thinking are moderately related. This is an important finding in the context of developing a greater

comprehension of mental toughness specifically in an educational context. If mental toughness and critical thinking were found to negatively correlate, then the possibility would have remained that mentally tough learners experienced less capability in thinking critically; which might be explained that the ability to think critically in EFL learners remains relatively unaffected by pressure, difficulty or adversity. However, the findings of this study coupled with previous evidence by (Nicholls et al., 2008) based on which there is a relationship between mental toughness and coping ability, and (Crust, 2007) according to which mental toughness and use of psychological strategies are correlated.

Null hypothesis 2: There is not any statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their gender.

Table (3): ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Total.CT	Between Groups	5630.435	1	5630.435	22.421	.000
	Within Groups	27623.556	110	251.123		
	Total	33253.991	111			
Total.MT	Between Groups	1728.982	1	1728.982	4.279	.041
	Within Groups	44443.009	110	404.027		
	Total	46171.991	111			

Results of the ANOVA test found significant differences ($p < .05$) in overall mental toughness and critical thinking of EFL learners in terms of their gender ($F(2,110)=22.421$, $p=.000$) and ($F(2,110)=4.279$, $p=.041$). More-detailed analysis of the data showed that women outperformed men and got higher scores.

Null hypothesis 3: There is not any statistically significant difference between mental toughness and critical thinking ability of EFL learners in terms of their specific field of study.

Table (4): ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Total.CT	Between Groups	353.580	1	353.580	1.182	.279
	Within Groups	32900.411	110	299.095		
	Total	33253.991	111			
Total.MT	Between Groups	452.009	1	452.009	1.088	.299
	Within Groups	45719.982	110	415.636		
	Total	46171.991	111			

Results of the ANOVA test found no significant difference ($p > .05$) in overall mental toughness and critical thinking of EFL learners in terms of their field of study ($F(2,110)=1.182, p=.279$) and $F(2,110)=1.088, p=.299$).

It is conceivable that mentally tough people are applying progressively powerful command over experienced feelings. This could ensnare various potential components such as consideration, contrasts in intellectual tasks or progressively broad adapting systems. ([G. Jones et al., 2007](#)) revealed that mentally tough students mainly concentrate on the task needs to be done, stay focused on a self-involved focus, and concentrate on processes instead of products. Moreover, ([Crust & Azadi, 2010](#)) claimed that there are significant correlations between mental toughness and utilization of psychological strategies such as self-talk, relaxation and emotional control which might be due to cognitive operations. In another study, ([Nicholls et al., 2008](#)) represented that there is a moderate correlation between mental toughness and utilization of coping strategies. Previous research on the association between MT and academic outcomes suggests that longitudinal research is needed to track student achievement over the standard three-year duration of undergraduate study ([Crust et al., 2014](#)). The findings of the study have extended previous findings in the area of research, demonstrating that MT and its subscales are important correlates of positive academic outcomes in higher education. Specifically, results showed that total MT explained approximately 9% of the variance in a measure of total academic performance, derived by marks achieved over the course of a three-year university degree in Psychology. Furthermore, the scales of commitment and control explained 16.5% of the variation in total academic performance. As such, control and commitment were the strongest MT predictors of academic performance. Therefore, interventions targeting control and commitment are most likely to benefit academic performance in the higher education.

The positive association between MT and academic performance may be explained by previous findings, which suggest that mentally tough individuals tend to demonstrate more problem-focused coping strategies and to cope with stress more effectively ([Levy et al., 2006](#)). High levels of MT may promote students' resilience in the face of adversities preventing stressors from impairing academic outcomes. Individual differences in MT did not correlate with attendance in the current research. However, attendance was a significant correlate of academic performance. It should be noted that the non-significant correlation between attendance and MT may occur due to the ceiling effect, as the amount of variation for the measure of attendance was low. This was because all students had to attend on at least a certain percentage of classes to be able to continue with their studies. Individual variation in MT, and specifically the scale of control associated positively with individuals' income. This finding provides support to the relevance of MT in organizational settings. It aligns closely with previous research which demonstrated that greater MT was related to better work performance ([Gucciardi et al., 2015](#)) and more senior managerial positions ([Marchant et al., 2009](#)). However, due to the cross-sectional nature of the study, we cannot dismiss the alternative explanation that people with higher income may feel more satisfied and engaged with their job ([Judge, Bono, Ilies, & Gerhardt, 2002](#)), and in turn, lead to an increased level of MT through the work process. Indeed, prior longitudinal research has shown a reciprocal relationship between personality traits and objective career success. Earning a higher income, for instance, decreased neuroticism across a ten-year period ([Sutin, Costa, Miech, & Eaton, 2009](#)). A similar relationship may exist between career success and aspects of MT. Longitudinal research is needed to provide a more comprehensive understanding of the relationship between MT and career success. We found a positive relationship between age and MT, and more specifically the subscales of commitment and confidence. This finding has important theoretical and applied implications suggesting that mental toughness is, at least to some degree, malleable and shaped by life experiences.

4. Conclusions

Endeavors to study mental toughness with regards to the broadened hypotheses are probably required to consider the works which have mainly focused on the connection between mental toughness and coping capabilities (Nicholls et al., 2008) among which is the ability to think critically. It is worth mentioning that the results of the study represented a difference between males and females based on which females gained higher scores both in critical thinking and mental toughness. This is in contrast with the findings of (Clough et al., 2002) who announced that the MTQ48 didn't segregate across sexual orientation. Albeit a few scientists or scholars may condemn the utilization of an intact class as a sample for this study, it is necessary to widen out the investigation on mental toughness of normal participants in educational context instead of following the given past analysts' over-accentuation on examining elites and experts (Crust, 2008). Surely, while existing studies have featured the qualities of elite learners' mental toughness, there have been few endeavors to investigate if there is any difference between students with higher or lower degrees of mental toughness in terms of such attributes, or the association with non-tip top students.

In conclusion, the present findings should be viewed as the beginning of understanding the role of MT in educational and work settings. The findings support previous literature suggesting that MT is an important personality trait in relation to academic and career success. By addressing the aforementioned limitations of this series of studies, future research could attempt to identify the nature of the association between MT and academic and career achievement, the factors that underlie these associations and the parameters that contribute to the development of MT. Finally, specific aspects of MT, such as the scale of commitment and confidence, may be more malleable than the other aspects of MT. Targeting these aspects of MT could maximize the effectiveness of intervention programs that aim at optimizing performance across achievement contexts. Future specialists might investigate the power of sub-components in higher and lower levels of education.

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