MENTAL TOUGHNESS IN HIGHER EDUCATION: RELATIONSHIPS WITH ACHIEVEMENT AND PROGRESSION IN FIRST YEAR UNIVERSITY SPORT STUDENTS

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Introduction

Over the last ten years, substantial research has been directed towards understanding MT within sport (Clough, Earle, & Sewell, 2002; Jones, Hanton, & Connaughton, 2002; Bull, Shambrook, James, & Brooks, 2005; Sheard, 2010). While there are some differences of opinion concerning the conceptualization of MT (see Crust, 2008), some have described it as a trait-like resistance resource that enables individuals to remain relatively unaffected by pressure or adversity, and even to flourish under such conditions (Clough et al.). In addition, MT is also characterized by competitiveness, high levels of persistence, and the ability to recover quickly following setbacks. There is general agreement that MT is a multidimensional construct comprised of a number of important positive psychological variables (Crust, 2008; Sheard, 2010). While several recent models of MT have been proposed (Jones, Hanton, & Connaughton, 2007; Gucciardi, Gordon, & Dimmock, 2009a) and tend to differ in regard to numbers of reported components (likely due to sampling differences), these are mostly based upon qualitative explorations and have failed to utilize existing psychological theory (Kaiseler, Polman, & Nicholls, 2009). One model of MT that offers perhaps the most parsimonious and theory driven account of the construct (cf. Weinberg & Gould, 2007) was provided by Clough et al. In their 4C's model, these researchers developed a conceptualization of MT that was based on existing theory from the health psychology domain. Clough and colleagues found that their own work on MT revealed a construct that closely resembled hardiness, an important psychological variable that has been shown to differentiate those who become ill from those who remain healthy or flourish in stressful circumstances (Kobasa, 1979).

Clough et al. (2002) proposed that MT is represented by: (1) control (emotional and life), which reflects a tendency to feel and act as if one is influential, (2) commitment, which concerns deep involvement with whatever one is doing, in contrast to alienation, (3) challenge,

refers to the extent to which individuals see problems as opportunities for self-development rather than threats, and (4) confidence (in abilities and interpersonal), reflecting a high sense of self belief and an unshakeable faith in having the ability to achieve success while not being intimidated. The fourth component, confidence, is one that has been consistently reported as the cornerstone of MT (cf. Crust, 2008; Sheard, 2010), and was added by Clough et al. to differentiate mental toughness from hardiness. Clough et al. also developed a measure of MT, the Mental Toughness Questionnaire (MTQ48) which measures each component of the 4C's model and has been found to have good reliability, as well as construct and criterion validity (Clough et al.; Crust & Clough, 2005). Furthermore, recent evidence has provided independent support for the factor structure of the MTQ48 using confirmatory factor analysis (Horsburgh, Schermer, Veselka, & Vernon, 2009). In a recent behavioral-genetic study using mono- and dizygotic twins, Horsburgh et al. (2009) found evidence that MT was significantly related to the Big Five personality factors of extraversion, neuroticism (negatively), agreeableness, openness to experience, and conscientiousness. In addition, the phenotypic correlations reported, were largely attributed to genetic factors, supporting the conceptualization of MT as a personality trait. At present, the MTQ48 appears to be the most widely used measure of MT.

The high-pressure nature of elite sport has provided an ideal setting in which to examine MT and to date, research has largely been conducted using athletic samples. Among other things, sport-based research has reported MT to be related to pain tolerance (Crust & Clough, 2005), injury rehabilitation (Levy, Polman, Clough, Marchant, & Earle, 2006), perceptions of exertion (Clough et al., 2002), coping effectiveness (Kaiseler, et al., 2009), use of psychological strategies (Crust & Azadi, 2010), and level of performance (cf. Sheard, 2010). In addition, recent qualitative work (MacNamara, Button, & Collins, 2010) concerning the psychological characteristics that enable athletes to translate potential into achievement (i.e., progress in

elite sport), reported a profile that closely resembles the MT model of Clough et al. (e.g., commitment, self-belief, competitiveness etc.). However, numerous other demanding performance and occupational domains exist (e.g., business, military, education) where theoretically MT should be equally important.

One recent study that has examined MT outside of sports settings, tested for differences between 522 managers (senior, middle, and junior levels) of UK-based organizations. Marchant et al. (2009) found that MT was significantly higher in more senior positions. An additional and important finding that emerged was that MT generally increased with age. This suggests that life experiences may have a significant and positive effect on the development of MT and opens up the possibility of targeted intervention strategies. In sport, there is already some evidence to suggest that interventions can result in performance increments and higher self-reported MT (Sheard & Golby, 2006; Gucciardi, Gordon, & Dimmock, 2009b).

Another setting where MT is likely to be important is higher education. For example, there is evidence (Fisher & Hood, 1987) that the transition to university life for both residential and home-based undergraduate students result in increased stress (most prominently through homesickness). Lazarus and Folkman (1984) defined stress as the negative feeling that occurs when an individual feels unable to cope with the demands placed upon them by their environment. Other sources of stress for undergraduate students include academic demands such as coursework deadlines or examinations, learning to manage one's time, financial problems, work / study balance, and loss of support networks (cf. Okopi, 2011). According to Wilson and Pritchard (2005) the cumulative effects of multiple stressors can negatively impact on student well-being and increase the likelihood of vulnerable students dropping out. While the learning environment and support mechanisms are external factors that can aid transition

(Nelson, Kift, Humphreys, & Harper, 2006), it seems equally likely that individual resources will contribute significantly to this process. Current statistics (HESA, 2011) predict that over 76,000 UK students who started degree programs in higher education will not finish, amounting to a drop-out rate of over 20 percent. Two factors that have been shown to be related to student adjustment (Pritchard, Wilson, & Yamnitz, 2007) and to MT (Nicholls, Polman, Levy, & Backhouse, 2008; Clough et al., 2002) are optimism and self-esteem.

Theoretically, there are a number of reasons to predict that MT will be related to important markers of student progress in higher education. First, whilst research relating academic performance with personality measures has resulted in few significant relationships, there has been one consistent finding. Conscientiousness has been found to be strongly and consistently associated with scholastic achievement (e.g., Bauer & Liang, 2003; Chamorro-Premuzic & Furnham, 2003). Conscientiousness has a clear overlap with the commitment component of the MTQ48 model. Sheard and Golby (2007) reported that the commitment component of Kobasa's Hardiness Scale (Kobasa, 1979) was positively associated with academic achievement. Given that mentally tough individuals are highly committed to whatever they are doing it is therefore likely that mentally tough students would have high levels of attendance and exert great effort with respect to coursework and examination revision.

A second reason to expect a relationship between MT and performance is related to Clough et al. (2002) definition of mental toughness. Another approach to the study of personality and academic achievement is to utilize narrow personality traits. O'Connor and Paunonen (2007) identify these as traits that reside at a lower level of the personality hierarchy. Narrow traits that have been linked to academic achievement include achievement orientation (e.g. Paunonen, 1998), risk taking (Wolfe & Johnson, 1995) and hardiness (Sheard & Golby, 2007). O'Connor and Paunonen (2007) concluded that these narrow traits are generally

stronger predictors. MT as defined by Clough et al. (2002) can be clearly defined as a narrow trait, and as such could be expected to have greater predictive power.

Third, the ability to cope with change and the simultaneous demands that occur during transitions, and to see this process as a challenge rather than a threat is indicative of mentally tough individuals who persist during adverse or difficult circumstances. As such, we predict a significant and positive relationship between MT and student progression. One final reason to expect MT to be related to academic success concerns the important characteristics of independence and responsibility. Various researchers have reported mentally tough athletes to be independent, able to solve their own problems, and to take responsibility for their own development (Bull et al., 2005; Crust & Clough, 2011; Sheard, 2010). These same attributes appear highly valued in higher education (Cottrell, 2008) and reflect the objectives of most institutions (i.e., to create independent learners).

In sum, it is expected that mentally tough students will flourish in higher education and that this will be reflected in important markers of progress and achievement. If the predicted relations do exist, and MT is found to relate to academic drop-out (non- progression) and academic achievement, it may be possible to measure MT to identify at-risk groups, and target support for such students to enable smoother transitions into university life.

Method

Participants

Participants were 161 first year university students (105 men, 56 women) enrolled on three different sports-related degree programs at a large UK university in the north of England. The sample consisted of sport and exercise science students (n = 46), sport coaching students (n = 65) and sport rehabilitation students (n = 50). Participants all provided basic demographic

information and signed an informed consent form prior to completing a mental toughness questionnaire. This study was approved via a university research ethics committee. All collected data was coded in order to maintain the confidentiality of participants.

Measures

The MTQ48 consists of 48 items that require responses to statements on a 5-point Likert scale ranging from (1) *strongly disagree*, to (5) *strongly agree*. The MTQ48 provides a total MT score and measures six subscales of challenge, commitment, emotional control, life control, confidence in abilities and interpersonal confidence. Example items include "*I don't usually give up under pressure*", and "*I generally try to give 100%*." Independent researchers have provided support for the factor structure of the questionnaire using CFA (Horsburgh et al., 2009). Support for the validity and reliability of the MTQ48 has previously been reported (cf. Clough et al., 2002).

Two measures concerning academic progress (i.e., credits) and achievement (i.e., end of year grade) were calculated. In relation to academic progress, students were awarded 20 credit points for passing a module of study (six modules studied per year) and require 120 credit points to pass and proceed to the next academic year. Students who acquire 60 to 100 credit points are eligible for re-sits in coursework and examinations, and if successful will then pass and proceed to the next academic year. Students who achieve less than 60 credit points are not eligible for re-sit opportunities (without mitigating circumstances) and are classified as failing the year. Although whether students passed, required re-sits, or failed the academic year provides an important measure of progress (and attrition), it does not indicate the actual standard of academic achievement. To measure achievement, mean grades for the year, as a percentage, were also calculated (mean of grades across six modules).

Procedure

At the end of taught sessions students were made aware of the research project and asked to take part. Importantly, students were informed that participation was voluntary, that they were free to take part (or not) or to withdraw consent, and that any decision would have no bearing on their treatment as a student. Participants that agreed were seated at a desk and were provided with a copy of the MTQ48 (Clough et al., 2002). The questionnaire was completed under controlled conditions where participants were not allowed to discuss their responses with others. Participants were reminded that the questionnaire did not constitute a test and that collected data would not be used for any other purpose than the present research study. In line with previous research (Crust & Clough, 2005), questionnaire completion took approximately 10 min.

Data analysis

Data was visually screened for outliers and checked for normality. Descriptive statistics were calculated on all study variables. Pearson correlations were used to examine relations between total MT, MT subscales, academic achievement (grade) and progression (credits). In addition, a linear regression analysis (enter method) was used to further examine significant relations between MT subscales and grades. One-way ANOVA was used to test for significant differences in total MT between groups (sport and exercise science, sport coaching, and sport rehabilitation) with Tukey HSD tests used for *post-hoc* analyses. MANOVA was used to test for differences between groups with respect to the MT subscales. Additionally, total MT scores were converted into sten scores in order to differentiate between participants with high (8-10), medium (4-7), and low (1-3) levels of MT. Two-way ANOVA (3 x 2) was then used to test for differences between these three groups, and between men and women in relation to end of

year grades. In relation to progression, students were divided into one of three groups (fails, 0-40 credits; re-sits, 60-100 credits; and passes, 120 credits) and compared using two-way ANOVA (also testing for gender differences) and MANOVA to test for differences in total MT and MT subscales respectively.

Results

Descriptive data for study variables in respect to gender, and participants who achieved pass, fail, or re-sit classifications are presented in Table 1. Table 2 presents Pearson correlations between study variables and shows that total MT, and all of the MT subscales (except emotional control) were found to be significantly and positively related to grades and credits. A linear regression analysis (enter method) was computed using the MT subscales (except emotional control for which there was no significant correlation) as predictor variables and end of year grade as the dependent variable. Life control (β = .21, p <.05) and interpersonal confidence (β = .19, p <.05) were found to be significant predictors accounting for 12% of the variance in end of year grades.

A significant difference was found in total MT between degree programs ($F_{2, 158}$ = 7.11, p < .01). Using Tukey HSD *post-hoc* tests, sport and exercise science students, and sport coaching students were both found to have significantly higher MT (p <.01) than sport rehabilitation students. While sport and exercise science students reported the highest levels of MT, these were not significantly different when compared to sport coaching students (p = .09). Multivariate analyses of differences in MT subscales found significantly higher levels of life control ($F_{2, 155}$ = 3.78, p < .05, d = 0.69) and confidence in abilities ($F_{2, 155}$ = 3.85, p < .05, d = 0.65) in the sport and exercise science students, than in sport rehabilitation students.

Using sten scores for the MTQ48, participants were classified as either high (n = 24), medium (n = 102), or low (n = 33) in MT. With respect to end of year grades, two-way ANOVA indicated significant main effects for level of MT ($F_{2, 158}$ = 4.28, p = .015) but not for gender or interactions (p >.05). *Post-hoc* analysis found that mean grades for students with high (M = 49.54, d = 0.71) and medium (M = 45.97, d = 0.51) MT were significantly higher (p <.01) than students with low MT (M = 37.01).

Finally, students who failed (n = 31; 0-40 credits), who required re-sits (n = 40; 60-100 credits) and students who passed (n = 88; 120 credits) their first year of study were compared in relation to total MT (along with men and women). Two-way ANOVA found significant main effects for credits ($F_{2, 158}$ = 3.11, p <.05) and for gender ($F_{1, 158}$ = 6.19, p < .05) but no significant interaction (p >.05). *Post-hoc* tests found those achieving pass grades had significantly higher total MT than those who failed (p <.01, d = 0.50), and men reported significantly higher levels of total MT than women (p <.01, d = 0.59). Multivariate analyses found higher interpersonal confidence ($F_{2, 156}$ = 4.31, p < .05) in students who passed, compared with students who failed (d = 0.90). In addition, students who passed, and students with re-sits were found to have significantly higher life control ($F_{2, 156}$ = 3.50, p < .05, d = 0.90) than students that failed. Men were found to report significantly higher levels of challenge ($F_{1, 155}$ = 8.01, p < .01, d = 0.50) and interpersonal confidence ($F_{1, 155}$ = 18.87, p < .01, d = 0.82) than women.

Discussion

The results of the present study support predictions concerning the role of MT in higher educational, as students who passed compared to those that failed their first year of study were found to have significantly higher levels of MT. In addition, the actual academic performance of students with high MT was found to be significantly higher (i.e., mean year grade) than those

with low levels of MT. In combination, these results indicate that students with high levels of MT are more likely to pass and proceed (rather than fail and drop-out) and achieve higher grades than students with low MT. This study is also important in terms of establishing the role of MT in achievement domains other than sport. The present study is one of the first, alongside Marchant et al. (2009), to provide evidence that MT is not just a sport-based construct, but an important trait that has much farther-reaching implications. When compared to sport-based evidence (e.g., Crust, 2008; Sheard, 2010), present findings are consistent in terms of establishing the importance of MT with respect to outcome measures. Also consistent with previous evidence (Nicholls, Polman, Levy, & Backhouse, 2009) was that men reported significantly higher levels of MT than women.

The results of this study show that commitment does relate to achievement as predicted. However, there was evidence to indicate that the MT subscales of life control and interpersonal confidence may be the most important in relation to achievement and progression. Both of these subscales were found to be significant predictors of end of year grades, and were found to differentiate between students that passed, and those that failed their first year of study. The transition from further to higher education in the UK places multiple and simultaneous demands on students and requires a period of adjustment (Pritchard et al., 2007). In particular, in comparison to school or college, university students are likely to encounter less tutor support, and as such are required to become independent learners with a high emphasis on study outside of the classroom or lecture theatre. It would seem reasonable to expect that students who had low levels of life control would also struggle to manage the additional demands posed by higher level study (e.g., deadlines, revision, reading etc.).

Feeling assured enough to interact with teaching staff and peers, to ask and answer questions in class discussions, and work with others in solving problems would seem to be natural outcomes for students with interpersonal confidence. Such activities are likely to lead to integration into the higher educational setting and to more learning through challenging others and supporting one's own positions. Previous research (Bennett, 2003) found that self-esteem played a crucial role in deciding to withdraw or continue with undergraduate study following receiving low grades. Given that mental toughness is widely recognized as being multidimensional, establishing the specific relationships between subscales and outcomes is very important in relating to developing appropriate and successful interventions. Present findings would suggest that interventions targeting life control and interpersonal confidence are most likely to benefit the participants in this study.

Another finding was that significant differences in MT were evident between students on differing degree programs. Students studying sport and exercise science were found to have significantly higher MT than students studying sports rehabilitation. One possible interpretation of this finding concerns the different skill sets and approaches needed to be successful in each of these areas. For example, the emphasis on practitioner-athlete relations (i.e., empathy, sensitivity) which has been described as bedside manner, and is integral to supporting injured athletes appears at odds with some of the reported characteristics of mentally tough individuals (e.g., insensitivity). The sport rehabilitation students have been pulled towards a vocational course which is both person-centered and non-competitive. This latter point is perhaps crucially important. Mentally tough individuals are driven by achievement and competition. Further work is needed to ascertain the pre-cursors and consequences of these differences. It is also important that they are placed in the wider context

of the caring professions which need an apparently contradictory skill set of resilience and compassion.

Present findings should be viewed as the beginning of understanding MT in educational settings. While this work has examined MT in students during their first year at university, more longitudinal research is needed to track student progress and achievement over the standard three-year duration of undergraduate study. Establishing distance travelled (i.e., between first year grades and final degree classification) could provide a basis for understanding how MT influences long-term progress and learning. Another variable that was not included in the present research (because data was unavailable) but should be measured in relation to MT is attendance. Given that mentally tough individuals characteristically have high levels of commitment and life control, it is likely that mentally tough students have better attendance records and manage their time more effectively in terms of meeting coursework submission deadlines. These additional markers can be measured by future researchers. Alongside further quantitative approaches, the use of qualitative methods such as interviews or focus groups could provide a more subtle understanding of differences between students with high and low MT. For example, understanding differences in how students typically respond to negative feedback, manage time outside of taught sessions, cope with stress, perceive demands, or seek out support could help to provide greater insight into the statistical relationships that have been established. Additionally, a number of other educational settings provide the potential to learn more about the role of MT. In terms of further understanding the relationship with outcome measures, this could include focus upon examination performance at school (G.C.S.E.) and school / college (A level) and possibly a comparison between MT in state and private educational establishments in terms of the development of MT.

Another important factor that researchers have found to influence the development of MT relates to the environment (i.e., challenging yet supportive learning environments that facilitate the independence of learners; see Crust & Clough, 2011). It is possible that the actual learning environment, where this encourages independence and personal responsibility, facilitates the development of MT. As Knight (1996) highlights, independence in learners should be viewed as a goal rather than a start-point. Longitudinal studies that evaluate MT over time are a priority if the malleability of the construct is to be better understood.

A number of limitations need to be acknowledged with respect to the present study. First, the use of a self-report measure of MT means that socially desirable responses could have influenced the results, although instructions given to participants rendered this less likely. Second, this study is limited to sports students at one university and as such future studies should look to examine MT across a broader spectrum of degree subjects and across a range of universities in the UK and elsewhere in order to understand if cultural and organizational differences are important. Finally, only first year students were studied in the present research and as such longitudinal research that tracks MT over the usual three-year period of undergraduate study is recommended to allow a broader understanding of the relationship between MT toughness and academic success.

Conclusion

One of the most important implications of the present research concerns the relationship between MT and progression. Both retention and achievement of students is a key priority for educational institutions especially given greater transparency of the sector through the publication of performance indicators and league tables (e.g., Good University Guide). With increasing competition, greater available choice, and where funding is linked to such outcomes

as retention and achievement, educational establishments view such performance indicators as high priority. Given the present findings, it appears that MT has a significant role in terms of both retention and achievement. Low scores on the MTQ48 indicate a greater possibility of failing in the first year of study at university. As such the MTQ48 could be an important screening device that would allow the identification of at-risk groups. These groups are likely to benefit from additional support in terms of adjusting to the demands of higher education. Importantly, the MTQ48 includes subscales that can allow targeted interventions in relation to individual profiles. For example, the support given to a student with low life control (e.g., managing one's time outside of class), would be considerably different to another student who has low levels of emotional control (i.e., gets anxious before exams). Crust and Clough (2011) provide examples of strategies that can be used to enhance different components of MT within sport. Sport-related research has found MT interventions to enhance both self-reported MT and performance (Gucciardi et al., 2009b; Sheard & Golby, 2006). Recently, Okopi (2011) has proposed an important role for interventions (especially counseling) in terms of aiding student adjustment and avoiding student attrition.

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