

- 1 Running head: Mental toughness and psychological wellbeing
- 2 Title: Relationships between mental toughness and psychological wellbeing in undergraduate
- 3 students

Abstract

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2 This study examined relationships between mental toughness (MT) and psychological
3 wellbeing (PWB) in undergraduate students. Following previous research that identified
4 significant and positive relations between MT and academic performance, it was
5 hypothesised that MT would predict PWB within a student population. Participants were
6 undergraduate students ($n = 168$) from nine United Kingdom universities. The sample
7 included participants from a range of different degree programmes and from all three years of
8 standard undergraduate study. Online questionnaires were completed to assess MT and PWB.
9 Multiple linear regression analyses found that components of MT were moderate to strong
10 predictors of PWB with between 35-64% of variance explained. Importantly, age, gender, and
11 level of study were not found to predict PWB. These findings are consistent with stated
12 hypotheses and further demonstrate the potential importance of MT within educational
13 settings.

14

15 Keywords: Higher education, mental toughness, wellbeing.

1.0 Introduction

1
2 In recent years, numerous studies have raised concerns about the mental health of university
3 students (Macaskill, 2013; Wynaden, Wichmann, & Murray, 2013). In particular the
4 transition from further to higher education is a process characterised by ambiguity and
5 changing academic, social and emotional demands that require psychological adjustment
6 (Nelson, Quinn, Marrington, & Clarke, 2013; Pritchard, Wilson, & Yamnitz, 2007). Wynaden
7 et al. identified university students as being a particular “at risk” population because the
8 typical age at which most young adults enter higher education, also coincides with the age of
9 onset of numerous psychological disorders (i.e. anxiety, depression) and substance abuse. In
10 the United Kingdom (UK) government policies to encourage a wider range of young people
11 to attend university, alongside concurrent reductions in financial support for students have
12 prompted predictions of increased mental health problems in the student population (UK
13 Royal College of Psychiatrics, 2011). Among other things, mental health problems in students
14 have been found to be associated with poor academic performance, increased rates of attrition
15 (i.e. programme drop-out), fewer days devoted to study, suicidal thoughts and disordered
16 eating (Duane, Stewart, & Bridgeland, 2003; Kugu, Akyuz, Dogan, Ersan, & Izcic, 2006).

17 Most studies that have examined mental health within university students have
18 utilised measures of illness, disturbance or distress. Despite this, the seminal work of
19 Seligman and Csikszentmihayli (2000) identifies psychological health as not simply the
20 absence of illness, but representing positive human functioning and flourishing. In this
21 regard, it is important to understand both the correlates of mental illness *and* to identify
22 predictors of psychological wellbeing and optimal functioning.

23 1.1 Psychological Wellbeing

1 Psychological wellbeing (PWB) represents “the achievement of one’s full
2 psychological potential” (Carr, 2004, p. 36). While different opinions exist concerning the
3 conceptualisation, PWB is generally agreed to be multidimensional. Ryff (1989) identified
4 six distinct components that represent the six-factor model of PWB comprising of (1) self-
5 acceptance (positive evaluations of oneself and one’s past life), (2) personal growth (sense of
6 development and continued growth as an individual), (3) purpose in life (belief that one’s life
7 is meaningful), (4) positive relations with others (existence of meaningful relationships with
8 others), (5) environmental mastery (capacity to effectively manage one’s life and the
9 surrounding world), and (6) autonomy (a sense of self-determination). Alongside this model,
10 Ryff developed a measurement instrument, the Scales of Psychological Wellbeing (SPWB),
11 which has been subjected to psychometric analyses using both exploratory and confirmatory
12 factor analysis, supporting the existence of six distinct components of PWB (Ryff & Keyes,
13 1995).

14 Much research has evaluated mental health in first-year university students and in
15 particular during the transition from further to higher education. First-year transition is
16 typically reported as stressful for many students who face the challenges of independent
17 living (being away from home for the first time, managing personal finances), developing
18 new friendships / support systems, and adjusting to new learning regimes (Scanlon, Rowling,
19 & Weber, 2010). Recent research, however, highlights that this is not the only period of
20 concern. For example, a study of 1197 students from a UK university (Macaskill, 2013)
21 found highest levels of psychiatric symptoms in second-year students. It was argued that
22 while UK universities targeted additional support for first-year students to enable a smoother
23 transition to university life (Nelson et al., 2013), the second year of study comprises a
24 different set of potential stressors. For example, second-year students typically have to move
25 out of university accommodation and adjust to life with new housemates. Second-year study

1 often involves new support tutors, optional modules and seminar groups that can separate
2 students from their friends. For many universities, second-year grades begin to contribute
3 towards final degree classification, adding additional pressure to perform well. These
4 pressures continue into the third year of study as students undertake their final assessments,
5 dissertation work, and eventually begin to plan for post-graduate study or employment. Thus,
6 students across all years of study have to cope with emerging challenges.

7 While some students experience psychological disturbance during time at university,
8 many others cope effectively and some thrive amidst the challenges. Whether someone
9 becomes mentally ill or functions optimally when faced with challenging circumstances is
10 likely due to complex interactions between genetic, biological, social, and cultural factors.
11 Various models of stress (see Ingram & Luxon, 2005) predict susceptibility is influenced by
12 underlying vulnerabilities, although protective factors can modify responses to stress. For
13 example, numerous studies (Costa, Somerfield, & McCrae, 1996; Kobasa, Maddi & Khan,
14 1982) have found that personality and concomitant individual differences in coping can
15 function as resistance resources that help buffer the potentially harmful effects of stress. One
16 such individual difference that has emerged from sports research as important during
17 confrontations with stress is mental toughness (MT).

18 **1.2 Mental Toughness**

19 Gucciardi, Gordon, and Dimmock (2009a) propose MT is a collection of
20 experientially developed and inherent values, attitudes, emotions, and cognitions that
21 influence the way in which an individual approaches, responds to, and appraises both
22 negatively and positively construed pressure, challenge, and adversity to consistently achieve
23 his or her goals. Conceptual arguments exist concerning the extent to which MT is inherited
24 and relatively stable (Clough & Strycharzyck, 2012; Horsburgh, Schermer, Veselka, &

1 Vernon, 2009) as opposed to being socialised or taught via more formal psychological skills
2 training (Gordon, 2012). While the theoretical debate continues, both qualitative and
3 quantitative studies have found MT to be somewhat amenable to development through
4 targeted interventions (Gordon, 2012; Gucciardi *et al.*, 2009b).

5 Clough, Earle, and Sewell (2002) proposed that MT is represented by: (1) control
6 (emotional and life), which reflects a tendency to feel and act as if one is influential, (2)
7 commitment, which concerns deep involvement with whatever one is doing, in contrast to
8 alienation, (3) challenge, refers to the extent to which individuals see problems as
9 opportunities for self-development rather than threats, and (4) confidence (in abilities and
10 interpersonal), reflecting a high sense of self belief and an unshakeable faith in having the
11 ability to achieve success while not being intimidated in dealings with other people.
12 Alongside this model, Clough *et al.* developed a measure of MT (Mental Toughness
13 Questionnaire-48; MTQ48) that has been extensively used and tested by researchers (see
14 Perry, Clough, Crust, Earle, & Nicholls, 2013). Using the measure and model of Clough *et*
15 *al.*, researchers have begun to expand the study of MT to encompass business, health, and
16 educational settings (see Clough & Strycharzyck, 2012). In one recent study, Crust, Earle,
17 Perry, Earle, Clough and Clough (2014) found MT significantly related to academic
18 achievement and progression in 161 first-year university students. In particular, life control
19 and interpersonal confidence were significant predictors of end of year grade. Students with
20 lower levels of MT were more likely to withdraw from their programme in the first year, and
21 as such it is likely that MT helps students to cope with challenges associated with transition
22 into higher education.

23 Theoretically, there are a number of reasons to predict MT will be related to PWB in
24 higher education students. While learning environment and support mechanisms are external
25 factors that can aid transition and coping (Nelson, Kift, Humphreys, & Harper, 2006),

1 individual resources will also contribute significantly to this process. MT is associated with
2 more effective coping skills and optimistic appraisals (Nicholls, Polman, Levy, & Backhouse,
3 2008), and high levels of self-esteem (Clough et al., 2002). Pritchard, Wilson, and Yamnitz
4 (2007) have shown optimism and self-esteem in particular, to be positively related to
5 effective student transitions.

6 The ability to cope with change and the simultaneous demands that occur during
7 transitions, and to see this process as a challenge rather than a threat is indicative of mentally
8 tough individuals who persist during adverse or difficult circumstances (Gucciardi et al.,
9 2009a). As such, we predict a significant and positive relationship between MT and PWB
10 within university students. The main aim of this study is to evaluate the relationship between
11 MT and PWB in university students. The existence of a relationship could have two
12 important applied implications for future research: namely the potential for the MTQ48 as a
13 screening device to identify students who may need support to manage the demands of higher
14 education, and the development of targeted interventions to support such students and
15 enhance wellbeing.

16 **2.0 Method**

17 **2.1 Participants**

18 The sample consisted of 168 undergraduate university students (44 men and 124
19 women) who were studying at nine universities in the UK. Participants age ranged from 18
20 to 40 years ($M = 20.83$ years ± 3.4 years). The sample involved 63 first-year students, 44
21 second-year students and 61 third-year students. Most of the sample was white British with
22 approximately five per cent from black and ethnic minority groups including Pakistani,
23 Zimbabwean, Polish and Nigerian. The majority of students were studying sport or

1 psychology related courses, although a broad range of other courses were represented
2 including mechanical engineering, aquatic zoology and fashion design.

3 **2.2 Instruments**

4 The SPWB (Ryff, 1989) was used to measure PWB. While different length versions
5 are available, the 54-item version was utilised meaning each of the six scales of wellbeing
6 was assessed via nine items. Questionnaire completion took approximately 10 min.
7 Participants responded using a six-point format with verbal anchors ranging from (1) *strongly*
8 *disagree* to (6) *strongly agree*. This instrument measures six scales of wellbeing. While there
9 is evidence of acceptable internal consistency and test-retest reliability (Ryff, 1989) this has
10 not been the case in all studies (Van Dierendonck, 2004). Although some have questioned the
11 existence of a six-factor model due to excessive overlap between scales (cf. Springer, Hauser,
12 & Freese, 2006), Ryff and Keyes (1995) originally argued that although some high inter-
13 correlations existed, difference across age profiles suggested distinctiveness. In defence of the
14 six-factor model, Ryff and Singer (2006) provided evidence from five categories of studies
15 (i.e., factorial validity, psychological correlates, sociodemographic correlates, biological
16 correlates, and intervention studies) that supported the distinctiveness of the six dimensions of
17 wellbeing.

18 The MTQ48 (Clough et al., 2002) was used to measure MT. This 48-item inventory
19 requires responses to statements on a 5-point Likert scale ranging from (1) *strongly disagree*,
20 to (5) *strongly agree*, and has an average completion time of around 10 min. Scores for
21 overall MT and for six subscales can be calculated. The MTQ48 has been extensively used to
22 measure MT and has generally been found to have good reliability, as well as demonstrating
23 construct and criterion validity (Clough et al.; Perry et al., 2013). Independent support for the
24 factor structure of the MTQ48 has been found using confirmatory factor analysis (Horsburgh

1 et al., 2009). A recent large scale evaluation of the MTQ48 supported the model and measure
2 although the reliability of one of the subscales (control emotion) was found to be inadequate
3 (Perry, et al., 2013). As such, while emotional control remains an important conceptual
4 component of MT, these authors recommend caution in interpreting findings from this
5 subscale.

6 **2.3 Procedure**

7 Lecturers known to members of the research team, and who worked in a variety of
8 different subject areas, were contacted at five UK universities. Initial contact was made via
9 email to outline the nature and importance of the present study with a link provided to the
10 online questionnaires. Information concerning the study was then sent via email lists to
11 students within departments where the lecturers worked. Students wishing to participate
12 followed an online link to complete questionnaires. Staff also recommended willing
13 academics at other institutions to distribute the email link which resulted in a wider range of
14 students from four additional UK universities. Data collection occurred midway through the
15 academic year. Questionnaire completion was self-paced and was followed by an online
16 written debrief. Ethical approval was received from a University ethics committee.

17 **2.4 Data Analysis**

18 Data was initially screened for missing variables and outliers. Kurtosis, skewness,
19 mean and standard deviation of variables were calculated before proceeding with further
20 statistical data analysis. Cronbach alpha scores identified the internal consistency of the
21 validated questionnaires. This was particularly important for the MTQ48, due to the
22 previously discussed suggestion to assess the internal consistency of subscales before
23 continuing with data analysis (Perry et al., 2013). Pearson Product Moment Correlations were
24 conducted to identify the relationship between MT and PWB. To control for demographic

1 effects, hierarchical multiple linear regression was used to examine the predictive capacity of
2 MT on wellbeing.

3 **3.0 Results**

4 No missing data was evident and examination of Q-Q plots revealed no troublesome
5 outliers. Tests of univariate normality revealed no departure from standard skewness (< 2) or
6 kurtosis (< 2). Descriptive statistics are presented in Table 1. Means for PWB were similar to
7 data reported by Ryff (1989) for young adults. MT subscales presented good internal
8 consistency (i.e., $\alpha > .70$) with the exception of emotional control ($\alpha = .46$) and life control (α
9 $= .69$). The internal consistency of life control was deemed to be at the lower end of
10 acceptability. To investigate the emotional control subscale further, the interitem correlation
11 matrix was examined. Items 26 and 34 presented some negative correlations. These two items
12 were previously identified by Perry et al. (2013) as weak and were therefore removed. The
13 five retained items generated a Cronbach's alpha of .58. This was used as a measure of
14 emotional control in all proceeding analyses. All PWB scales presented good internal
15 consistency (Table 1).

16 Pearson's bivariate correlations were examined to identify relationships among all
17 variables. Notably, every relationship in the matrix was statistically significant. All
18 components of MT were positively associated with all components of PWB. The strongest
19 relationships existed between confidence in abilities and self-acceptance ($r = .77, p < .01$),
20 commitment and environmental mastery ($r = .70, p < .01$), life control and environmental
21 mastery ($r = .67, p < .01$), and confidence in abilities and environmental mastery ($r = .66, p$
22 $< .01$). All correlations are presented in Table 1. Very high correlations can be an indication of
23 redundancy (Kline, 1999). The moderate to moderately-high correlations between PWB
24 scales supports the relative independence of each scale.

1 To further explore the relationships between MT and PWB variables, we conducted a
2 series of hierarchical multiple linear regression analyses. In each analysis, age, gender, and
3 year of study were entered at step one using the enter method. At step two, the six MT
4 variables were entered. Each aspect of wellbeing acted as the dependent variable in separate
5 analyses. Overall, the results indicated that much of the variance for each wellbeing scale was
6 explained by one or more component of MT. In total, the variance explained of each
7 wellbeing scale ranged from 35 to 64%. Specifically, autonomy was positively predicted by
8 commitment ($\beta = .22, p < .01$) and interpersonal confidence ($\beta = .51, p < .001$).
9 Environmental mastery was positively predicted by commitment ($\beta = .42, p < .001$) and
10 confidence in abilities ($\beta = .27, p < .01$). Personal growth was positively predicted by
11 challenge ($\beta = .34, p < .001$) and commitment ($\beta = .30, p < .01$). Positive relations were
12 positively predicted by confidence in abilities ($\beta = .47, p < .001$). Purpose in life was
13 positively predicted by commitment ($\beta = .47, p < .001$) and life control ($\beta = .29, p < .01$) and
14 self-acceptance was positively predicted by confidence in abilities ($\beta = .65, p < .001$).

15 **4.0 Discussion**

16 The main aim of the present study was to evaluate the relationship between MT and PMB
17 across a broad range of undergraduate university students. Consistent with predictions, PWB
18 was significantly and positively related to MT. In particular, components of MT were found
19 to be moderate / strong predictors of PWB. In contrast age, gender and year of study did not
20 predict wellbeing. Present findings, alongside recent work (Crust et al., 2014), highlights the
21 importance of MT in higher education. There is now considerable evidence MT is an
22 important resistance resource in several life domains relating to performance outcomes (i.e.
23 success) and mental health / positive psychological functioning (Clough & Strycharczyk,
24 2012). Given the pressures and challenges facing contemporary undergraduate students, and
25 the levels of psychological disturbance in university students previously reported,

1 understanding more about how personal resources can offer protection against ill health and
2 enable students to flourish is timely. Importantly, the present study has used a measure of
3 PWB rather than assuming that wellbeing simply reflects the absence of illness. Moreover,
4 the results of the present study identify which particular components of MT predict each of
5 the six scales of PWB, allowing for more targeted future interventions to enhance wellbeing.

6 Commitment was found to be the strongest predictor of both environmental mastery and
7 purpose in life. Theoretically this makes sense as managing the multiple and complex
8 demands of student life (Scanlon et al., 2010; Wynaden, 2013) likely necessitates deep
9 engagement and persistence. Likewise, living a meaningful life and retaining a sense of
10 purpose and direction is reflective of being deeply involved and committed to what one is
11 doing (Kobasa et al., 1982). Confidence in abilities was the strongest predictor of both
12 positive relations with others and self-acceptance. With self-acceptance reflecting positive
13 evaluations of the self and of one's past life (Ryff, 1989) the relationship with confidence in
14 abilities is in line with self-efficacy theory (Bandura, 1977) and in particular the most
15 consistent source of reported efficacy, past accomplishments. Furthermore, Clough and
16 Strycharczyk (2012) reported high confidence in abilities reflected optimism and personal
17 perceptions of worthiness. Intuitively it may have been expected that interpersonal
18 confidence would be the strongest predictor of positive relations with others as it reflects the
19 confidence to interact with and not be intimidated by others. Nevertheless, high interpersonal
20 confidence was found to predict autonomy and not positive relations with others (perhaps
21 because high interpersonal confidence can lead to over-assertiveness). Given that autonomy
22 concerns self-determination, independence and an ability to resist social pressures (Ryff &
23 Keyes, 1995) the relationship with interpersonal confidence is consistent with theoretical
24 expectations. Finally, the relationship between personal growth and challenge is grounded in
25 psychological theory (Kobasa et al, 1982) and reflects challenge seekers approaching rather

1 than avoiding difficult situations, liking competition and problem solving (Clough &
2 Strycharczyk, 2012) and thus achieving personal growth through learning by many varied
3 experiences. The only component of MT not found to significantly predict PWB was
4 emotional control and that in part is likely due to problems with the reliability of the scale
5 (see Perry et al., 2013).

6 One of the strengths of the present study was that participants were obtained from several
7 different universities across a wide range of subjects and across all years of undergraduate
8 study. Nevertheless several limitations are acknowledged. First, while the use of online data
9 collection has several strengths, there is less control over the actual completion of questions
10 (i.e. alone or with others present) which may have impacted upon some responses. Second, as
11 with all questionnaires there is the potential for socially desirable responding. Finally, only a
12 small number of students invited to participate actually did and there was evidence of a
13 greater response rate for women than men. Nevertheless, gender was not found to be a
14 significant predictor in this study.

15 While most researchers and theorists conceptualise MT as a multidimensional construct,
16 Gucciardi, Hanton, Gordon, Mallett and Temby (in press) propose a unidimensional
17 conceptualisation may be more appropriate. However, the present results and other research
18 (i.e. Crust et al., 2014) highlight that established components of MT have differential effects
19 upon, or relationships with outcome variables such as PWB or academic achievement. While
20 most measures incorporate an overall assessment of MT, the value of assessing and
21 understanding the predictive qualities of subscales (which have been established through
22 rigorous testing and underpin existing models – see Perry et al., 2013) is evident.

23 High levels of MT are related to a willingness to question, respond positively to critical
24 feedback, assert oneself in group settings, see competence in others as a source of motivation,
25 approach challenges as an opportunity to learn and develop, prioritise effectively, expend

1 high amounts of effort, manage time effectively and remain calm when under pressure
2 (Clough & Strycharczyk, 2012). Whilst these appear to be feasible explanations of the
3 purported relationships, it is worth noting that low levels of MT are therefore related to lower
4 PWB. Students with lower MT are likely to be less resilient to the demands of higher
5 education. As others have highlighted (Crust et al., 2014) the MTQ48 might be an important
6 screening device in the identification of “at risk” students who may not have the necessary
7 personal resources to succeed at university. This may be more reflective of dealing with the
8 challenges of higher education rather than any lack of academic ability. As such, future
9 researchers might profitably examine the impact of interventions for students with low levels
10 of MT to determine the impact upon success and PWB. Whilst the effects of MT
11 interventions have not been widely studied there are some theoretical underpinnings (Crust &
12 Clough, 2011; Gordon, 2012) and empirical work (Gucciardi et al., 2009b) that could be used
13 to adapt interventions from sport to higher education contexts.

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