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Title: Relationships between mental toughness and psychological wellbeing in undergraduate students
Abstract

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

Keywords: Higher education, mental toughness, wellbeing.
1.0 Introduction

In recent years, numerous studies have raised concerns about the mental health of university students (Macaskill, 2013; Wynaden, Wichmann, & Murray, 2013). In particular the transition from further to higher education is a process characterised by ambiguity and changing academic, social and emotional demands that require psychological adjustment (Nelson, Quinn, Marrington, & Clarke, 2013; Pritchard, Wilson, & Yamnitz, 2007).

Wynaden et al. identified university students as being a particular “at risk” population because the typical age at which most young adults enter higher education, also coincides with the age of onset of numerous psychological disorders (i.e. anxiety, depression) and substance abuse. In the United Kingdom (UK) government policies to encourage a wider range of young people to attend university, alongside concurrent reductions in financial support for students have prompted predictions of increased mental health problems in the student population (UK Royal College of Psychiatrics, 2011). Among other things, mental health problems in students have been found to be associated with poor academic performance, increased rates of attrition (i.e. programme drop-out), fewer days devoted to study, suicidal thoughts and disordered eating (Duane, Stewart, & Bridgeland, 2003; Kugu, Akyuz, Dogan, Ersan, & Izgic, 2006).

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

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

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

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

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

1.2 Mental Toughness

Gucciardi, Gordon, and Dimmock (2009a) propose MT is a collection of
experientially developed and inherent values, attitudes, emotions, and cognitions that
influence the way in which an individual approaches, responds to, and appraises both
negatively and positively construed pressure, challenge, and adversity to consistently achieve
his or her goals. Conceptual arguments exist concerning the extent to which MT is inherited
and relatively stable (Clough & Strycharzyck, 2012; Horsburgh, Schermer, Veselka, &
Vernon, 2009) as opposed to being socialised or taught via more formal psychological skills training (Gordon, 2012). While the theoretical debate continues, both qualitative and quantitative studies have found MT to be somewhat amenable to development through targeted interventions (Gordon, 2012; Gucciardi et al., 2009b).

Clough, Earle, and Sewell (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 in dealings with other people.

Alongside this model, Clough et al. developed a measure of MT (Mental Toughness Questionnaire-48; MTQ48) that has been extensively used and tested by researchers (see Perry, Clough, Crust, Earle, & Nicholls, 2013). Using the measure and model of Clough et al., researchers have begun to expand the study of MT to encompass business, health, and educational settings (see Clough & Strycharzyck, 2012). In one recent study, Crust, Earle, Perry, Earle, Clough and Clough (2014) found MT significantly related to academic achievement and progression in 161 first-year university students. In particular, life control and interpersonal confidence were significant predictors of end of year grade. Students with lower levels of MT were more likely to withdraw from their programme in the first year, and as such it is likely that MT helps students to cope with challenges associated with transition into higher education.

Theoretically, there are a number of reasons to predict MT will be related to PWB in higher education students. While learning environment and support mechanisms are external factors that can aid transition and coping (Nelson, Kift, Humphreys, & Harper, 2006),
individual resources will also contribute significantly to this process. MT is associated with more effective coping skills and optimistic appraisals (Nicholls, Polman, Levy, & Backhouse, 2008), and high levels of self-esteem (Clough et al., 2002). Pritchard, Wilson, and Yamnitz (2007) have shown optimism and self-esteem in particular, to be positively related to effective student transitions.

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 (Gucciardi et al., 2009a). As such, we predict a significant and positive relationship between MT and PWB within university students. The main aim of this study is to evaluate the relationship between MT and PWB in university students. The existence of a relationship could have two important applied implications for future research: namely the potential for the MTQ48 as a screening device to identify students who may need support to manage the demands of higher education, and the development of targeted interventions to support such students and enhance wellbeing.

2.0 Method

2.1 Participants

The sample consisted of 168 undergraduate university students (44 men and 124 women) who were studying at nine universities in the UK. Participants age ranged from 18 to 40 years (M = 20.83 years ± 3.4 years). The sample involved 63 first-year students, 44 second-year students and 61 third-year students. Most of the sample was white British with approximately five per cent from black and ethnic minority groups including Pakistani, Zimbabwean, Polish and Nigerian. The majority of students were studying sport or
psychology related courses, although a broad range of other courses were represented including mechanical engineering, aquatic zoology and fashion design.

2.2 Instruments

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

The MTQ48 (Clough et al., 2002) was used to measure MT. This 48-item inventory requires responses to statements on a 5-point Likert scale ranging from (1) strongly disagree, to (5) strongly agree, and has an average completion time of around 10 min. Scores for overall MT and for six subscales can be calculated. The MTQ48 has been extensively used to measure MT and has generally been found to have good reliability, as well as demonstrating construct and criterion validity (Clough et al.; Perry et al., 2013). Independent support for the factor structure of the MTQ48 has been found using confirmatory factor analysis (Horsburgh © 2016. This manuscript version is made available under the CC-BY-NC-ND 4.0 license http://creativecommons.org/licenses/by-nc-nd/4.0/
et al., 2009). A recent large scale evaluation of the MTQ48 supported the model and measure although the reliability of one of the subscales (control emotion) was found to be inadequate (Perry, et al., 2013). As such, while emotional control remains an important conceptual component of MT, these authors recommend caution in interpreting findings from this subscale.

2.3 Procedure

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

2.4 Data Analysis

Data was initially screened for missing variables and outliers. Kurtosis, skewness, mean and standard deviation of variables were calculated before proceeding with further statistical data analysis. Cronbach alpha scores identified the internal consistency of the validated questionnaires. This was particularly important for the MTQ48, due to the previously discussed suggestion to assess the internal consistency of subscales before continuing with data analysis (Perry et al., 2013). Pearson Product Moment Correlations were conducted to identify the relationship between MT and PWB. To control for demographic
effects, hierarchical multiple linear regression was used to examine the predictive capacity of
MT on wellbeing.

3.0 Results

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

Pearson’s bivariate correlations were examined to identify relationships among all
variables. Notably, every relationship in the matrix was statistically significant. All
components of MT were positively associated with all components of PWB. The strongest
relationships existed between confidence in abilities and self-acceptance (r = .77, p < .01),
commitment and environmental mastery (r = .70, p < .01), life control and environmental
mastery (r = .67, p < .01), and confidence in abilities and environmental mastery (r = .66, p <
.01). All correlations are presented in Table 1. Very high correlations can be an indication of
redundancy (Kline, 1999). The moderate to moderately-high correlations between PWB
scales supports the relative independence of each scale.
To further explore the relationships between MT and PWB variables, we conducted a series of hierarchical multiple linear regression analyses. In each analysis, age, gender, and year of study were entered at step one using the enter method. At step two, the six MT variables were entered. Each aspect of wellbeing acted as the dependent variable in separate analyses. Overall, the results indicated that much of the variance for each wellbeing scale was explained by one or more component of MT. In total, the variance explained of each wellbeing scale ranged from 35 to 64%. Specifically, autonomy was positively predicted by commitment ($\beta = .22, p < .01$) and interpersonal confidence ($\beta = .51, p < .001$). Environmental mastery was positively predicted by commitment ($\beta = .42, p < .001$) and confidence in abilities ($\beta = .27, p < .01$). Personal growth was positively predicted by challenge ($\beta = .34, p < .001$) and commitment ($\beta = .30, p < .01$). Positive relations were positively predicted by confidence in abilities ($\beta = .47, p < .001$). Purpose in life was positively predicted by commitment ($\beta = .47, p < .001$) and life control ($\beta = .29, p < .01$) and self-acceptance was positively predicted by confidence in abilities ($\beta = .65, p < .001$).

### 4.0 Discussion

The main aim of the present study was to evaluate the relationship between MT and PWB across a broad range of undergraduate university students. Consistent with predictions, PWB was significantly and positively related to MT. In particular, components of MT were found to be moderate / strong predictors of PWB. In contrast age, gender and year of study did not predict wellbeing. Present findings, alongside recent work (Crust et al., 2014), highlights the importance of MT in higher education. There is now considerable evidence MT is an important resistance resource in several life domains relating to performance outcomes (i.e. success) and mental health / positive psychological functioning (Clough & Strycharczyk, 2012). Given the pressures and challenges facing contemporary undergraduate students, and the levels of psychological disturbance in university students previously reported,
understanding more about how personal resources can offer protection against ill health and enable students to flourish is timely. Importantly, the present study has used a measure of PWB rather than assuming that wellbeing simply reflects the absence of illness. Moreover, the results of the present study identify which particular components of MT predict each of the six scales of PWB, allowing for more targeted future interventions to enhance wellbeing.

Commitment was found to be the strongest predictor of both environmental mastery and purpose in life. Theoretically this makes sense as managing the multiple and complex demands of student life (Scanlon et al., 2010; Wynaden, 2013) likely necessitates deep engagement and persistence. Likewise, living a meaningful life and retaining a sense of purpose and direction is reflective of being deeply involved and committed to what one is doing (Kobasa et al., 1982). Confidence in abilities was the strongest predictor of both positive relations with others and self-acceptance. With self-acceptance reflecting positive evaluations of the self and of one’s past life (Ryff, 1989) the relationship with confidence in abilities is in line with self-efficacy theory (Bandura, 1977) and in particular the most consistent source of reported efficacy, past accomplishments. Furthermore, Clough and Strycharczyk (2012) reported high confidence in abilities reflected optimism and personal perceptions of worthiness. Intuitively it may have been expected that interpersonal confidence would be the strongest predictor of positive relations with others as it reflects the confidence to interact with and not be intimidated by others. Nevertheless, high interpersonal confidence was found to predict autonomy and not positive relations with others (perhaps because high interpersonal confidence can lead to over-assertiveness). Given that autonomy concerns self-determination, independence and an ability to resist social pressures (Ryff & Keyes, 1995) the relationship with interpersonal confidence is consistent with theoretical expectations. Finally, the relationship between personal growth and challenge is grounded in psychological theory (Kobasa et al, 1982) and reflects challenge seekers approaching rather
than avoiding difficult situations, liking competition and problem solving (Clough & Strycharczyk, 2012) and thus achieving personal growth through learning by many varied experiences. The only component of MT not found to significantly predict PWB was emotional control and that in part is likely due to problems with the reliability of the scale (see Perry et al., 2013).

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

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

High levels of MT are related to a willingness to question, respond positively to critical feedback, assert oneself in group settings, see competence in others as a source of motivation, approach challenges as an opportunity to learn and develop, prioritise effectively, expend
high amounts of effort, manage time effectively and remain calm when under pressure (Clough & Strycharczyk, 2012). Whilst these appear to be feasible explanations of the purported relationships, it is worth noting that low levels of MT are therefore related to lower PWB. Students with lower MT are likely to be less resilient to the demands of higher education. As others have highlighted (Crust et al., 2014) the MTQ48 might be an important screening device in the identification of “at risk” students who may not have the necessary personal resources to succeed at university. This may be more reflective of dealing with the challenges of higher education rather than any lack of academic ability. As such, future researchers might profitably examine the impact of interventions for students with low levels of MT to determine the impact upon success and PWB. Whilst the effects of MT interventions have not been widely studied there are some theoretical underpinnings (Crust & Clough, 2011; Gordon, 2012) and empirical work (Guacciardi et al., 2009b) that could be used to adapt interventions from sport to higher education contexts.

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