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Mental toughness in education: Exploring relationships with attainment, attendance, behaviour and peer relationships

Helen St Clair-Thompson[1], Myfanwy Bugler[1], Jamey Spokes[1], Peter Clough[1], Sarah McGeown[2,] and John Perry[3]

[1] Department of Psychology, University of Hull

[2] School of Education, University of Edinburgh

[3]Department of Sport, Health and Nutrition, Leeds Trinity University

Address for correspondence:

Helen St Clair- Thompson

Department of Psychology

University of Hull

Hull, HU6 7RX

UK

Tel. +44 1482 465339

E-mail H.St-Clair-Thompson@hull.ac.uk

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Abstract

Mental toughness has frequently been associated with successful performance in sport; however recent research suggests that it may also be related to academic performance in Higher Education. In a series of three exploratory studies, we examined the relationship between mental toughness and different aspects of educational performance in adolescents aged 11-16, focusing on academic attainment, school attendance, classroom behaviour and peer relationships. Study 1 revealed significant associations between several aspects of mental toughness (but particularly control of life) and academic attainment and attendance. Study 2 revealed significant associations between several aspects of mental toughness (but again particularly control of life) and classroom behaviour. Finally, Study 3 demonstrated significant associations between fewer aspects of mental toughness (confidence in abilities and interpersonal confidence) and peer relationships. The results are discussed in terms of the potential value of mental toughness as a useful concept in education.

Mental toughness describes how people deal with challenges, stressors and pressure irrespective of prevailing circumstances. It has been frequently related to successful sport performance (e.g. Bull, Shambrook, James, & Brooks, 2005; Connaughton, Wadey, Hanton, & Jones, 2008; Gucciardi, Gordon, & Dimmock, 2009; Jones, Hanton, & Connaughton, 2007), as it enables athletes to cope with the demands of sport during training and competition. However, there are numerous competitive and pressured environments that exist outside of sport (e.g. Crust, 2008; Gerber, Brand, Feldmeth, & Elliot et al., 2012). Therefore, mental toughness could be usefully explored within other contexts, such as education.

Several theoretical models of mental toughness have been proposed (e.g. Gucciardi et al., 2009; Jones et al., 2007). In many, the characteristics of mental toughness are described in terms of resilience. Resilience refers to a tendency to cope with stress and adversity, but is usually considered as a process rather than a trait or characteristic (e.g. Rutter, 2008). Mental toughness is also described as similar to the concept of hardiness, a personality disposition that is a resistance resource when confronting stress (e.g. Kobasa, 1979; Kobasa, Maddi, & Kahn, 1982; Maddi, 2004). According to Kobassa (1979) hardiness consists of three main components; control, referring to the ability to feel and act is if in control of various life situations, commitment, referring to the tendency to involve rather than distance oneself from whatever one is doing, and challenge, referring to the ability to understand that change is normal and can lead to self- development.

The model that perhaps offers the most parsimonious account of the construct of mental toughness (e.g. Weinberg & Gould, 2007) was provided by Clough, Earle and Sewell (2002), and was developed from the concept of hardiness. According to this model mental toughness is comprised of four sub-components; commitment, challenge, control, and confidence. Commitment is defined as the ability to carry out tasks successfully despite problems or obstacles and challenge refers to seeking out opportunities for self development. Control is subdivided into emotional control, described as the ability to keep anxiety in check and not reveal emotions to others, and life control,

a belief in being influential and not controlled by others. Confidence is subdivided into confidence in abilities, or a belief in individual qualities with little dependence on external validation, and interpersonal confidence, referring to being assertive and not intimidated in social contexts. Confidence in abilities and interpersonal confidence distinguish mental toughness from hardiness (Clough et al., 2002).

Based on this conceptualisation, Clough et al. (2002) developed an instrument to measure mental toughness; the Mental Toughness Questionnaire 48 (MTQ48). The MTQ48 has emerged as the most commonly used measure of mental toughness (Gucciardi, Hanton, & Mallett, 2012). Although it has attracted some criticism (e.g. Connaughton, Hanton, Jones & Wadey, 2008; Gucciardi et al., 2012), scores on the MTQ48 have been found to correlate significantly with other positive psychological variables such as life satisfaction, self-esteem (Earle, 2006) and optimism (Nicholls, Polman, Levy & Backhouse, 2008). Studies have also reported suitable internal reliability (Clough et al., 2002; Crust & Swann, 2011; Marchant, Clough, Polman, Jackson & Nicholls, 2009), and factorial validity (Perry, Clough, Crust, Earle, & Nicholls, 2013).

The concept of mental toughness, and the MTQ48, has now been employed in many settings outside of sport. For example, Marchant, Polman, Clough and Jackson et al. (2009) examined mental toughness in occupational settings. Levels of mental toughness varied significantly between employees in different managerial positions, with senior managers displaying the highest levels of toughness, followed by middle managers, junior managers, and then clerical staff. Gerber et al. (2012) examined mental toughness in relation to life satisfaction and the occurrence of depressive symptoms. Mental toughness was positively related to life satisfaction and negatively related to depressive symptoms. Therefore mental toughness may be an important construct in sport, occupational, and health settings. Of particular relevance to the present study however, it may also be important within education.

There are many reasons to suggest that mental toughness is important in educational settings. For example, Horsburgh et al., (2009) found significant positive correlations between mental toughness and conscientiousness. Conscientiousness is known to be a good predictor of academic achievement (e.g. Bauer & Liang, 2003). Mental toughness is also characterised by low anxiety levels (e.g. Clough et al., 2002), which have been associated with greater academic attainment (e.g. Owens, Stevenson, Norgate, & Hadwin, 2008). Research has examined the relationships between hardiness and academic study, revealing that commitment is closely linked to academic performance in undergraduate students (Sheard & Golby, 2007). There is also evidence that adjustment to University life is related to optimism and self-esteem (e.g. Pritchard, Wilson & Yamnitz, 2007), both of which are also associated with mental toughness (e.g. Clough et al., 2002). Consistent with these suggestions, Clough et al. (submitted) revealed that the academic performance of undergraduate students with high mental toughness was significantly better than those with low levels of mental toughness, and that students with low levels of mental toughness were also more likely to drop-out of their undergraduate course.

The growing interest in mental toughness, as well as hardiness and resilience, is in part a consequence of mental toughness being viewed as a mindset (e.g. Sheard, 2010) which could be changed through psychological skills training. Indeed, within sport there are numerous texts concerning what might broadly be called mental toughness training (e.g. Bull et al., 1996; Goldberg, 1998; Loehr, 1995). Although these texts appear to lack a sufficient theoretical underpinning (see Crust, 2008) there are some studies which are have revealed improvements in mental toughness as a result of interventions. For example, Sheard and Golby (2006) evaluated the effects of a 7-week program consisting of goal setting, visualisation, relaxation, concentration, and thought stopping skills. It was found to result in significant increases in mental toughness in a group of athletes (see also; Crust, 2008, Crust & Clough 2011).

Mental toughness interventions are also starting to be used in educational settings, particularly in areas of low socio-economic status. For example, Clough and Strycharczyk (2012) described an intervention known as "stay and succeed" which encourages learners to think about control, confidence, challenge, and commitment. The project encourages participants to be better prepared for what life "throws at them", cope with difficulties and challenges, be more resilient, better organised, adopt positive thinking, and bounce back from setbacks. Although the project is still at its early stages, the results do appear encouraging. For example, retention rates have increased since beginning the project. Mental toughness therefore has important implications for social and educational policy. For example, the All Party Parliamentary Group on social mobility, a group formed by the UK government to discuss key issues and indicators of social mobility with the aim of informing government policy, recently held a summit focussed on resilience at which research into mental toughness was presented.

Given that mental toughness if often viewed as a mindset (Sheard, 2010), it is important to note that mental toughness differs from personality. Personality traits are generally regarded as relatively stable and consistent (Roberts & DelVecchio, 2000) and therefore resistant to change. In comparison with mental toughness however, there is a considerable body of research which has demonstrated relationships between personality and aspects of education, including academic attainment (e.g., Bratko, Chamorro-Premuzic & Saks, 2006; Laidra, Pullmann & Allik, 2007; Noftle & Robins, 2007; Rosander, Bäckstrom & Stenberg, 2011). Indeed, a recent meta-analysis examining the relationship between personality and academic attainment (Poropat, 2009) reported differential relationships across different personality traits; conscientiousness consistently being most closely related to academic attainment. Due to the greater potential to shape or enhance mental toughness, it is arguably important to identify the relationship between mental toughness and aspects of education. Similar to personality, it would be predicted that some aspects of mental toughness would be more closely associated with academic attainment than others; but that all

aspects of mental toughness may be related to some aspects of adolescents' educational experiences.

Theoretically, in education those scoring high on the mental toughness component of challenge will be more likely to cope with changes or transitions and environments that are challenging. Those scoring high on commitment are focused and diligent as they strive to achieve goals, and this is likely to be advantageous for educational attainment. Control may be related to education in contexts where students need to manage anxiety levels (i.e., before upcoming exams) or it may confer advantages on academic success as students high in life control will manage their school workload effectively, being good at planning, time management and prioritizing. Confidence may also be important for attainment, and those who feel confident with others may be more likely to have a wider circle of friends and may contribute more eagerly in group or class activities.

In the current series of studies we therefore aimed to explore the usefulness of the concept of mental toughness in education. Although mental toughness could be related to numerous aspects of education, here we chose to focus on attainment, attendance, classroom behaviour and peer relationships, to reflect a diverse range of adolescent's educational experiences.

Study 1

Study 1 was designed to examine the relationships between mental toughness and attainment and attendance in secondary school pupils. Based on the findings of Clough et al. (submitted), who revealed that mental toughness was important for attainment and retention of undergraduate students, it was hypothesised that there would be significant relationships between mental toughness and attainment and attendance in secondary school students. In particular, it was predicted that challenge, commitment, control of life and confidence in abilities would be related to academic achievement and attendance, as these constructs map more closely to academic skills

than control of emotion and interpersonal confidence, which are more concerned with emotional and social development.

Method

Participants. The participants were 159 students (89 males and 70 females) aged 13-15 years of age (mean age 14 years and 5 months) from a school in the North East of England. The socio-economic background of the pupils was mixed, and all students in participating classes were asked to take part. There were no exclusion criteria.

Materials and procedure. Students were asked to complete the Mental Toughness Questionnaire 48 (MTQ48, Clough et al., 2002). This is comprised of 48 items assessing the six dimensions of mental toughness: challenge, commitment, control of emotions, control of life, confidence in abilities and confidence in personal life. Challenge is defined as the extent to which individuals view problems as opportunities for self-development. Commitment reflects a deep involvement in whatever the individual is doing. Control is subdivided into two dimensions, emotional control and control of life. Emotional control is the ability to keep anxieties in check and not reveal emotions to others, and life control concerns a belief in being influential and not controlled by others. Confidence is also subdivided into dimensions, confidence in abilities and interpersonal confidence. Confidence in abilities reflects the belief in individual qualities with less dependence on external support and interpersonal confidence is about being assertive and less likely to be intimidated in social events. There are a total of 48 items in the questionnaire. For each item the students agree/disagree with a series of statements on a 5 point Likert-type scale (ranging from "I disagree strongly" to "I agree strongly"). An average score was computed for each of the subscales.

Schools were then asked to supply the latest national curriculum levels for each student who took part in the study. In England it is common practice for teachers to rate each student's progress in English, mathematics and science according to the level they have achieved on the

national curriculum each academic term. These scores therefore comprise teacher's assessments of student's progress based on tasks and tests that are administered informally rather than standardised test scores. The levels range from 2 to 8, with the expected level for students in this age group being 5 or 6. As we were not predicting different relationships between mental toughness and these different curriculum subjects, an average score was calculated based on performance across all three curriculum areas. In addition, close correlations were found between scores in the three curriculum areas: $r = .74$ between English and mathematics, $r = .70$ between English and science, and $r = .70$ between mathematics and science. Schools were also asked to supply information about each student's attendance, in the form of percentage of attendance in the previous full academic term which was a period of 15 weeks.

Results

Cronbach's alpha values were computed for each of the subscales of the MTQ48; challenge, commitment, control of emotion, control of life, overall control, confidence in abilities, interpersonal confidence and overall confidence, as well as total mental toughness. Previous research has revealed relatively low reliability of the control of emotion subscale (Perry et al., 2013) and has suggested the removal of two questionnaire items, questions 26 and 34. These two items were therefore removed, the resulting cronbach alpha values being .62, .69, .47, .50, .67, .64, .51, .66, and .87 respectively.

Table 1 shows the descriptive statistics for mental toughness, attainment and attendance. Table 2 shows correlations between scores on each subcomponent of the mental toughness questionnaire and student's attainment and attendance. Challenge, commitment, control of life, overall control, and total mental toughness were significantly related to both attainment and attendance. In addition, control of emotion and confidence in abilities were significantly related to attendance.

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Table 1 about here

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Table 2 about here

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Linear regression analyses (enter method) were then conducted using the scores on the mental toughness subscales that were significantly related to attainment and attendance[1]. The outcome of these analyses is shown in Table 3. For attainment the model accounted for 12% of the variance, $F(3,152) = 6.36$, $p < .01$, with control of life ($p < .01$) predicting significant variance. For attendance the model accounted for 9% of the variance, $F(5, 153) = 3.03$, $p < .01$, again with significant variance predicted by control of life ($p <.01$).

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Table 3 about here

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Discussion

The aim of Study 1 was to examine the relationships between mental toughness and student's attainment and attendance at school. The results revealed significant relationships between several aspects of mental toughness and student's attainment and attendance; challenge, commitment, control of life, and overall control, in addition to total mental toughness. However, regression analyses revealed that the most important component of mental toughness for attainment and attendance was control of life.

The relationship observed between control of life and attainment supports the findings of Clough et al. (submitted), who examined the relationships between mental toughness, attainment and drop-out in University students. Control of life is assessed using statements such as "I generally feel in control" and "when working with other people I am usually quite influential". It would

therefore seem reasonable to expect that students who have high levels of control will find it easier to manage the demands of school, including studying several subjects, completing homework, and taking part in extracurricular activities than children who have lower levels of control. Similarly, children who have higher levels of control may feel able to manage these demands whilst dealing with threats to their attendance, including illness. It is, however, important to note that Clough et al. (submitted) also found evidence that interpersonal confidence was important for attainment and progression. Future research would therefore benefit from examining developmental differences in the relationships between mental toughness, attainment and attendance.

It is also important to note that some of the correlations between mental toughness and attainment and attendance were relatively weak. Mental toughness accounted for 12% of the variance in attainment and 9% of the variance in attendance. However, the finding of significant relationships between mental toughness and student's attainment and attendance has important implications for educational practice. For example, it provides support for the suggestion that schools should employ interventions aimed at improving student's mental toughness (e.g. Clough & Strycharczyk, 2012) and that these may have beneficial effects. This will be returned to in the general discussion.

Study 2

Having examined associations between aspects of mental toughness and adolescent's attainment and attendance, the aim of Study 2 was then to examine the relationships between mental toughness and adolescent's classroom behaviour. Teachers frequently report high levels of concern about student's classroom behaviour (e.g. Haroun & O'Hanlon, 1997; Houghton, Wheldall & Merrett, 1988; Kaplan, Gheen, & Midgley, 2002; Merrett & Wheldall, 1984; Stephenson, Martin, & Linfoot, 2000). This is pertinent because negative classroom behaviour has been reported to be closely associated with lower academic attainment (Gibb, Fergusson & Horwood, 2008; Hinshaw,

1992). Therefore, finding factors that may be related to students behaviour, and in particular factors that can potentially be changed via intervention, is extremely important for educators.

In this study, students were therefore tested on the MTQ48, and teachers were asked to complete a Conners' Teachers Rating Scale for each child. This assesses four dimensions of behaviour in the classroom: oppositional behaviour, cognitive problems/inattention, hyperactivity and ADHD. Oppositional behaviour refers to breaking rules, not respecting authority and being easily annoyed. Cognitive problems/inattention refers to difficulties with concentration, completing tasks and organisational skills. Hyperactivity refers to difficulty sitting still, staying on task, being restless or impulsive and finally, ADHD Index identifies behaviours associated with students 'at risk' for ADHD. Due to evidence of associations between student's behaviour and their scholastic attainment (e.g. Hinshaw, 1992), it was hypothesised that there would be significant relationships between aspects of mental toughness and student's classroom behaviour.

Method

Participants. The participants were 295 adolescents (142 males and 153 females) aged 11-15 years of age (mean age 14 years and 8 months). They were recruited from 2 schools in the North of England. The socio-economic background of the pupils was mixed, and all students in participating classes were asked to take part. There were no exclusion criteria.

Materials and procedure. Students were asked to complete the Mental Toughness Questionnaire 48 (MTQ48, Clough et al., 2002) as detailed in Study 1. To assess behaviour form teachers were then asked to complete a Conners' Teachers Rating Scale Revised (CTRS - R) Short Version for each child. This is comprised of 28 items assessing cognitive problems/inattention, oppositional behaviour, hyperactivity and ADHD. Cognitive problems/inattention refers to difficulties with concentration, completing tasks and organisational skills. Oppositional behaviour refers to breaking rules, not respecting authority and being easily annoyed. Hyperactivity refers to difficulty

sitting still, staying on task, being restless or impulsive. Finally, the ADHD Index identifies behaviours associated with students 'at risk' for ADHD. For each item teachers are asked to rate the extent to which the behaviour has been displayed by the child over the previous weeks. Teachers are required to respond to each statement using a 4 point Likert scale. The total score for each dimension is computed for each child. Previous studies have established suitable reliability and validity of the scale (e.g. Conners, Sitarenios, Parker, & Epstein, 1998).

Results

Again items 26 and 34 from the MTQ48 were removed for analysis (e.g. see Perry et al., 2013). Cronbach's alpha values were then calculated as .64, .67, .48, .54, .66, .69, .60, .70, and .89 for challenge, commitment, control of emotion, control of life, overall control, confidence in abilities, interpersonal confidence, overall confidence, and total mental toughness.

Table 4 shows the descriptive statistics for mental toughness and aspects of student's behaviour. There was a relatively high kurtosis for control, but not for the separate control of emotion and control of life subscales. Table 5 shows the correlations between scores on each subcomponent of the mental toughness questionnaire and teacher ratings of adolescents' behaviour. Commitment, control of life, control, interpersonal confidence, and total mental toughness were significantly related to each of the four aspects of adolescents' behaviour. Challenge was also related to oppositional behaviour and cognitive problems, and confidence to oppositional behaviour, cognitive problems and ADHD.

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Table 4 about here

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Table 5 about here

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Linear regression analyses (enter method) were then conducted using the scores on the mental toughness subscales that were significantly related to behaviour. The outcome of these analyses for each subtype of behaviour is shown in Table 6. For oppositional behaviour the model accounted for 10% of the variance, $F(5,289) = 5.51$, $p < .01$, with commitment ($p < .01$) predicting significant variance. For cognitive problems the model accounted for 7% of the variance, $F(4, 290) = 5.80$, $p <.01$, with control of life ($p< .05$), accounting for significant variance. For hyperactivity the model accounted for 6%, $F(2, 292) = 8.81$, $p <.01$, with the significant predictor being control of life ($p < .01$). Finally, for ADHD the model accounted for 8% of the variance, $F(3, 291) = 8.84$, $p <.01$, again with significant variance predicted by control of life ($p < .01$).

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Table 6 about here

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Discussion

The aim of Study 2 was to explore the relationships between the subcomponents of mental toughness and adolescents' behaviour in the secondary school classroom. The results revealed significant inverse relationships between several aspects of mental toughness (namely, commitment, control of life, control, interpersonal confidence and total mental toughness) and student's engagement in negative classroom behaviours. Challenge, control of emotion and overall confidence were also related to some aspects of behaviour. However, the regression analyses revealed that the most important aspect of mental toughness for classroom behaviour was control of life, which was a significant predictor of three of the subtypes of behaviour.

Given the links between mental toughness and conscientiousness (Horsburgh et al., 2009), the findings of significant relationships between mental toughness and behaviour are consistent with previous findings of relationships between conscientiousness and antisocial and aggressive

behaviour (e.g. Miller, Lynam, & Jones, 2008). The results further revealed an important distinction between oppositional behaviour and the other subcomponents of behaviour assessed by the CTRS-R. Oppositional behaviour was best predicted by commitment, but the other subtypes of behaviour by control of life.

It is of course important to note that some of the correlations found in the current study were relatively weak, and that components of mental toughness only accounted for up to 10% of the variance in adolescents' behaviour. However, the measures were completed by different people, students and their teachers. The significant associations therefore support the suggestion that adolescents' mental toughness is associated with how they behave in the classroom. Again, this has important implications for educational practice and for the employment of mental toughness training.

Study 3

Having demonstrated associations between components of mental toughness and student's attainment, attendance, and behaviour in the school classroom, Study 3 then aimed to explore the relationships between mental toughness and student's peer relationships. Peer relationships are important for a number of aspects of student's development (e.g. Parker, Rubin, Price, & DeRosier, 1995), including academic performance (e.g. Liem & Martin, 2011).

It has been suggested that mentally tough individuals are often sociable and outgoing with high levels of self esteem (Clough et al., 2002). Children with higher levels of self esteem have been found to have a greater number of positive peer relationships (Cheng & Furnham, 2002; Rose & Rudolph, 2006). Mental toughness is often described in terms of resilience (e.g. Gerber et al., 2012), and it has also been proposed that peer likeability is related to resilience (Masten & Coatsworth, 1998). It therefore seems reasonable to suggest that mental toughness will be associated with peer relationships. Consistent with this suggestion, Jarvinen and Nicholls (1996) noted a connection

between social relationships and mental toughness; their investigations into adolescent peer relationships found that a key factor for adolescents forming positive relationships was 'being tough'. It was therefore hypothesised that aspects of mental toughness would be significantly related to student's peer relationships. More specifically, interpersonal confidence was hypothesised to be particularly related to peer relationships.

Method

Participants. The participants were 93 students (50 males and 43 females) aged 11-13 years of age (mean age 11years and 5 months, SD 6 months). They were recruited from 2 schools in the North of England. The socio-economic background of the pupils was mixed, and none of the students had participated in Studies 1 or 2.

Materials and procedure. Students were asked to complete the Mental Toughness Questionnaire 48 (MTQ48, Clough et al., 2002) as detailed in Study 1 and were also asked to complete two measures of peer relationships. The first was the Social Inclusion Survey (Frederickson, 1994). In this survey students were asked to answer 'How much do you like to *play* with ___?' for each student from their tutor group, and then 'How much do you like to *work* with ___?' for each student in their group. Students responded either 'I don't know them', 'I like to play/ work with them', 'I don't mind whether I play/ work with them' or 'I don't like to play/ work with them'. The proportion of children who responded 'I like to play/ work with them' was calculated for each child.

The second measure of peer relationships was the social acceptance scale from the Self Perception Profile (Harter, 1985). This comprises 6 sets of 2 contrasting statements such as "some children find it hard to make friends' and 'for other children it's pretty easy'. For each of the 6 sets students are instructed to choose which statement is 'most like them' and then they are asked to indicate whether the statement is 'really true of me' or 'sort of true for me'. A score of 1,2,3, or 4 is then awarded for each answer. A 4 is awarded if a child responds 'really true of me' to a 'socially

accepted' statement such as 'for other children it's pretty easy', and a 3 is given if a response of 'sort of true for me' is given. A 2 is awarded if a 'sort of true for me' response is given for a 'less accepted' statement such as 'some children find it hard to make friends', and a score of 1 is given if 'really true of me' is given. A total score is then calculated for each child.

Students completed each of the questionnaires in their classroom at school, being instructed to complete the questionnaires in the order that they were provided. The order of questionnaires was then counterbalanced across participants so that adjacent students received questionnaires in different orders. This was to minimise the chance of students discussing or copying responses from their friends.

Results

Again items 26 and 34 from the MTQ48 were removed from the data (e.g. see Perry et al., 2013). Cronbach's alpha values were then calculated as .66, .71, .70, .41, .73, .63, .65, .72, and .90 for challenge, commitment, control of emotion, control of life, overall control, confidence in abilities, interpersonal confidence, overall confidence, and total mental toughness.

Table 7 shows the descriptive statistics for mental toughness and peer relationships. Table 8 shows the correlations between scores on each subcomponent of the mental toughness questionnaire and student's scores on the Social Inclusion Survey and Self Perception Profile. For the Social Inclusion Survey there were significant relationships between student's ratings of "Play with" and "Work with" and both confidence in abilities and interpersonal confidence as well as total mental toughness. Scores on the Self Perception Profile were significantly related to challenge, control of emotion, control of life, overall control, confidence in abilities, interpersonal confidence, overall confidence, and total mental toughness.

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Table 7 about here

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Table 8 about here

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Linear regression analyses (enter method) were then conducted using the scores on the mental toughness subscales that were significantly related to scores on the peer relationships measures. The outcome of these analyses is shown in Table 9. For the Social Inclusion Survey "play with" ratings interpersonal confidence was a significant predictor ($p < .05$), with the model accounting for 10% of the variance, $F(2,90) = 5.16$, $p < .05$. For the" work with" ratings the model accounted for 9%, $F(2, 90) = 4.50$, $p < .05$, with confidence in abilities predicting significant variance. For the Self Perception Profile both confidence in abilities ($p < .05$) and interpersonal confidence ($p < .01$) were significant predictors, accounting for 24% of the variance, $F(5, 87) = 5.61$, $p < .01$.

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Table 9 about here

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Discussion

The aim of Study 3 was to examine the relationships between mental toughness and student's peer relationships. Confidence in abilities, interpersonal confidence, overall confidence and total mental toughness were significantly related to social inclusion, and challenge, control of emotion, control of life, and each aspect of confidence were significantly related to self perceptions of social acceptance. The outcomes of the regression analyses then demonstrated that the extent to which students like to play with another student is particularly associated with that student's interpersonal confidence but the extent to which students like to work with another student is associated with their confidence in abilities. In contrast, student's self-perceptions of social acceptance were significantly related to their confidence in abilities and their interpersonal

confidence. Together with the findings of Studies 1 and 2 these results suggest that mental toughness is a construct which is significantly related to several aspects of education; attainment, attendance, behaviour, and also peer relationships.

Given that the confidence subcomponent of mental toughness is closely related to the concept of self esteem (Clough et al., 2002), the findings of Study 3 are consistent with previous suggestions that self-esteem is important for student's peer relationships (e.g. Cheng & Furnham, 2002; Rose & Rudolph, 2006). They further reveal an important distinction between confidence in abilities and interpersonal confidence, with interpersonal confidence being particularly important for student's ratings of who they would like to play with but confidence in abilities being particularly associated with ratings of who they would like to work with. This finding has implications for models of mental toughness and for the use of the MTQ48 (Clough et al., 2002). In particular it suggests that there is value in considering the abilities and interpersonal components of confidence as separate dimensions, rather than combining the scores to produce an overall confidence measure. Again the significant relationships between aspects of mental toughness and student's peer relationships also have important implications for interventions focussed on improving mental toughness. The findings will be discussed further in the general discussion.

General Discussion

The aim of the current studies was to explore the relationships between adolescents' mental toughness and various aspects of their secondary school experiences; namely attainment, attendance, behaviour, and peer relationships. The findings revealed significant relationships between aspects of mental toughness and each of these outcomes. Prior to these studies, mental toughness had predominantly been studied within the domain of sport (e.g. Bull et al., 2005; Connaughton et al., 2008; Gucciardi et al., 2009; Jones et al., 2007). Clough et al. (submitted) recently demonstrated that mental toughness is also an important construct within higher

education. Here we have extended previous findings and demonstrated that mental toughness is also a useful construct within secondary schools.

The findings of Studies 1 and 2 showed that control of life was related to attainment, attendance, and student's classroom behaviour. In many ways it is not surprising that control was important. Students scoring highly on control of life are described as likely to manage their workload effectively, being good at planning, time management and prioritizing (e.g. Clough & Strycharczyk, 2002). This is likely to be beneficial for attainment, and result in few disruptive behaviours. The concept of control is captured in many theories of academic motivation, particularly attribution theory. For example, Weiner (2010) suggested that the main causes of students behaviour are having either an internal or external locus of control and either stable or unstable causal stability. If a student has an internal locus of control (arguably similar to a high level of control in mental toughness theory) they perceive achievement as a result of ability or effort, rather than task difficulty or luck. Such students are therefore more likely to be engaged in learning, have positive behaviours and reach higher levels of achievement. Further research would therefore benefit from developing a better understanding of how the subcomponents of mental toughness are related to constructs such as motivation.

It is, however, interesting to note that in study 2 oppositional behaviour was best predicted by commitment rather than control of life. Students scoring highly on commitment are described as focused and diligent (e.g. Clough & Strycharczyk, 2002). They are therefore likely to be engaged and apply effort in learning environments. In this way the characteristics of highly committed students may be similar to the characteristics of highly conscientious students, who apply more academic effort (e.g. Noftle & Robbins, 2007). Consequently these students may engage in less oppositional behaviour.

Study 3 revealed that confidence was closely associated with aspects of student's behaviour. Confidence is closely linked with self-esteem (Clough et al., 2002), which has also been associated

with peer relationships (e.g. Cheng & Furnham, 2002; Rose & Rudolph, 2000). However it is important to note the distinction between confidence in abilities and interpersonal confidence. Study 3 revealed that although both confidence in abilities and interpersonal confidence were important for student's self-perceptions of their peer relationships, students are more likely to want to play with students who have high levels of interpersonal confidence but more likely to want to work with students with high levels of confidence in abilities. It is possible that interpersonal confidence reflects self-esteem whereas confidence in abilities is more specifically linked to the concept of self-efficacy. Self-efficacy is a construct which refers to an individual's belief in their ability, or inability, to achieve (Bandura, 1977, 1993). Therefore, again future research would benefit from examining the links between aspects of mental toughness and its overlap with constructs from motivational theory, such as self- esteem and self-efficacy.

The findings of relationships between mental toughness and aspects of educational performance have important implications for educational practice. Mental toughness is often viewed as a mindset (e.g. Sheard, 2010) which could be changed through psychological skills training. For example, Sheard and Golby (2006) found that mental toughness could be enhanced through an intervention consisting of goal setting, visualisation, relaxation, concentration, and thought stopping skills. Although this study explored mental toughness in a group of athletes, it has been suggested that mental toughness interventions could also be useful within educational settings. Clough and Strycharczyk (2012) described an intervention known as "stay and succeed" which is based on the current conceptualisation of mental toughness, tapping control, confidence, challenge, and commitment. Although the project is still at its early stages, the results do appear encouraging. For example, retention rates have increased since beginning the project.

Although research into mental toughness in education, and mental toughness interventions, is still in its infancy, a number of strategies for training mental toughness were summarized by Crust and Clough (2011). They emphasised the need for goal setting, self-reflection, educational programs

aimed at parents, and providing social support. The findings of the current studies suggest that adolescents' attainment, behaviour, and peer relationships could potentially be improved via interventions focussing particularly on commitment, control of life, and confidence. It may be the case that self- reflection can promote commitment and associated engagement and effort in classroom settings. Self-reflection and goal setting could act as a form of attribution training, encouraging an internal locus of control. Combined with parental or social support this may encourage adolescents to feel influential and not controlled by others. Confidence could be enhanced by using esteem support, bolstering adolescent's feelings of competence. Another important factor that researchers have found to influence the development of mental toughness relates to the learning environment. Environments which encourage independence and personal responsibility may facilitate the development of mental toughness (see Crust & Clough, 2011).

It is, however, important to note a number of limitations with the current studies. Although studies have reported suitable reliability (Clough et al., 2002; Crust & Swann, 2011; Marchant et al., 2009), and validity (Perry et al., 2013) of the MTQ48, these studies have employed adult participants. Here, the MTQ48 was used with adolescents aged 11-16 years of age. Cronbach's alpha coefficients suggested good reliability of challenge, commitment, control and confidence, as well as total mental toughness. However, when control and confidence were separated into their subcomponents the resulting reliabilities for control of emotion and control of life were lower than ideal (.47 and .50 in Study 1, .48 and .54 in Study 2, and .70 and .41 in Study 3). This suggests that future research would benefit from addressing the reliability and validity of the MTQ48 for use with adolescents, and also from exploring other potential methods for assessing mental toughness within an educational context.

The present findings should also be viewed as the beginnings of an understanding of mental toughness in educational settings. Further research is needed to examine how mental toughness influences attainment and behaviour in the long-term. It would also be interesting to explore

relationships between mental toughness and other aspects of student's educational experiences. For example, if mental toughness acts as a resilience resource when confronted with pressure or stress (e.g. Crust et al., 2008; Gerber et al. 2012) then student's scoring highly on mental toughness may better cope with the transition from primary school to secondary school. As a result of proposed changes to the education system in the UK, which include curriculum subjects being assessed through large end of year examinations rather than via coursework or modular assessments it would also be interesting to explore relationships between aspects of mental toughness and examination performance. Alongside further quantitative approaches the use of qualitative methods such as interviews or focus groups could provide a more in depth understanding of the characteristics of students with high or low mental toughness. This could then inform future research into mental toughness interventions. It would also be useful to examine the cognitive skills associated with mental toughness. Dewhurst, Anderson, Cotter, Crust, and Clough (2012) found that scores on the commitment subscale of the MTQ48 were related to performance in the directed forgetting paradigm. This suggests that mentally tough individuals are able to prevent unwarranted memories from undermining their performance. Future research would benefit from an examination of other cognitive skills associated with mental toughness, and from exploring whether these mediate the relationships between mental toughness and academic outcomes.

In conclusion, the current studies revealed significant relationships between mental toughness and education; including attendance, attainment, behaviour and peer relationships. This suggests that mental toughness is a useful construct within education. These findings have important implications for educational practice, suggesting many potential benefits of employing mental toughness interventions, particularly focussing on commitment, control of life and confidence. However, further research is needed to develop a better understanding of mental toughness within education, and to inform the development of appropriate and useful interventions.

Footnotes

[1] Due to high correlations between total mental toughness and the subcomponents of mental toughness total mental toughness was not entered in to the regression analyses. Similarly, due to high correlations between overall control and its two subcomponents, and overall confidence and its two subcomponents, the overall control and confidence scores were not entered.

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Table 1: Descriptive statistics for mental toughness, attainment and attendance

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	Mean	SD	Skew	Kurtosis
Challenge	3.30	.53	-.33	1.00
Commitment	3.09	.51	.00	2.04
Control of emotion	2.90	.66	-.49	.08
Control of life	3.08	.50	.08	.58
Control (composite score)	3.01	.50	-.06	-.09
Confidence in abilities	3.18	.56	-.48	.48
Confidence interpersonal	3.44	.58	.18	.32
Confidence (composite score)	3.28	.46	-.26	.32
Total mental toughness	3.17	.40	-.07	1.37
Attainment	5.28	1.05	-.23	-.47
Attendance	93.61	6.34	-1.35	1.85

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Table 2: Correlations between mental toughness, attainment and attendance

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	Attainment	Attendance
Challenge	.17*	.16*
Commitment	.23**	.19*
Control of Emotion	.06	.17*
Control of Life	.33**	.29**
Control	.23**	.27**
Confidence in Abilities	.06	.22**
Confidence Interpersonal	.09	-.11
Confidence	.09	.10
Total mental toughness	.22**	.22**

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Note: ** p< .01, * p < .05

Table 3: Summary of the Regression Analyses for attainment and attendance

_____

	B (at entry)	SEB	*B* (at entry)
Attainment			
Constant	2.94	.61	
Challenge	-.06	.18	-.03
Commitment	.22	.19	.11
Control of life	.59	.19	.29
Attendance			
Constant	85.44	3.80	
Challenge	6.05	1.12	.00
Commitment	.66	1.21	.05
Control of emotion	-.20	1.02	-.02
Control of life	2.98	1.29	.24
Confidence in abilities	5.74	1.26	.07

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Table 4: Descriptive statistics for mental toughness and negative classroom behaviour

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	Mean	SD	Skew	Kurtosis
Challenge	3.39	.47	.58	1.23
Commitment	3.23	.47	.58	2.23
Control of emotion	3.08	.63	.08	.70
Control of life	3.12	.49	.61	2.03
Control	3.34	.46	1.13	4.88
Confidence in abilities	3.15	.56	-.03	1.65
Confidence interpersonal	3.39	.62	.21	.18
Confidence	3.25	.46	.80	2.01
Total mental toughness	3.29	.40	1.21	4.69
Oppositional behaviour	2.45	3.67	1.55	1.67
Cognitive problems	3.50	3.71	.95	.19
Hyperactivity	2.52	4.05	2.01	3.85
ADHD	6.13	7.86	1.44	1.45

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Table 5: Correlations between mental toughness and negative classroom behaviour

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	Oppositional	Cognitive	Hyperactivity	ADHD
Challenge	-.16*	-.13*	-.11	-.11
Commitment	-.28**	-.22**	-.20**	-.23**
Control of Emotion	-.19**	-.11	-.07	.05
Control of Life	-.27**	-.24**	-.23**	-.25**
Control	-.26**	-.20**	-.17**	-.16**
Confidence in Abilities	-.11	-.04	-.03	-.04
Confidence Interpersonal	-.16**	-.17**	-.15**	-.20**
Confidence	-.16**	-.12*	-.10	-.14*
Total mental toughness	-.23**	-.17**	-.14*	-.15**

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Note: ** p< .01, * p < .05

Table 6: Summary of the Regression Analyses for behaviour

_____

	B (at entry)	SEB	*B* (at entry)
Oppositional			
Constant	10.68	1.72	
Challenge	.47	.59	.06
Commitment	-1.53	.66	-.20
Control of emotion	-.24	.40	-.04
Control of life	-1.03	.57	-.14
Confidence interpersonal	-1.28	.38	-.05
Cognitive			
Constant	10.58	1.76	
Challenge	-.52	.58	-.07
Commitment	-1.04	.65	-.13
Control of life	-1.22	.57	-.16
Confidence interpersonal	-.50	.38	-.08
Hyperactivity			
Constant	9.50	1.72	
Commitment	-.79	.63	-.09
Control of life	-1.42	.61	-.17
ADHD			
Constant	23.37	3.49	
Commitment	-1.61	1.22	-.10
Control of life	-2.46	1.20	-.15
Confidence interpersonal	-1.29	.79	-.10

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Note: ** p< .01, * p < .05

Table 7: Descriptive statistics for mental toughness and peer relationships

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	Mean	SD	Skew	Kurtosis
Challenge	3.41	.59	-.20	-.58
Commitment	3.33	.57	.41	-.39
Control of emotion	3.04	.86	-.19	-.84
Control of life	3.11	.53	.27	.15
Control	3.08	.60	.11	-.63
Confidence in abilities	3.25	.60	-.38	-.11
Confidence interpersonal	3.32	.73	-.04	.02
Confidence	3.28	.54	-.60	.59
Total mental toughness	3.26	.48	-.12	-.34
SIS play with	28.12	14.47	.20	-.13
SIS work with	33.29	16.55	.22	-.54
Self-perception	18.14	3.88	-.22	-.87

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Table 8: Correlations between mental toughness and peer relationships

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	SIS Play with	SIS Work with	Self-perception
Challenge	.18	.13	.28**
Commitment	.13	.18	.15
Control of Emotion	.07	.10	.28**
Control of Life	.10	.16	.28**
Control	.10	.14	.31**
Confidence in Abilities	.24*	.26*	.40**
Confidence Interpersonal	.29**	.24*	.41**
Confidence	.31**	.30**	.49**
Total mental toughness	.22*	.24*	.38**

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Note: ** p< .01, * p < .05

Table 9: Summary of the Regression analyses for peer relationships

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	B (at entry)	SEB	*B* (at entry)
Social Inclusion Survey			
Play with			
Constant	1.19	8.81	
Confidence in abilities	3.59	2.60	.15
Interpersonal confidence	4.61	2.16	.23
Social Inclusion Survey			
Work with			
Constant	3.34	10.14	
Confidence in abilities	5.44	3.00	.20
Interpersonal confidence	3.70	2.49	.16
Self Perception Profile			
Constant	7.82	2.55	
Challenge	-.34	.83	-.05
Control of emotion	.23	.57	.05
Control of life	-.57	1.01	-.08
Confidence in abilities	2.07	-.82	.32
Interpersonal confidence	1.76	.62	.33

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Note: ** p< .01, * p < .05