**The potential benefits and costs of participation in school sport: an extended cross sectional study**

***This research shows the importance and usefulness of a balanced non-academic portfolio and the particular importance of sport for student wellbeing and character development*.**

**Professor Peter Clough**

**Department of Psychology**

**University of Huddersfield**



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**Background**

There is some consensus on the impacts of physical activity on psychological factors. Drawing on clinical and epidemiological studies, as well as narrative and meta-analytic reviews it can be concluded that physical activity, usually of a moderate level:

* has a small-to-moderate beneficial effect on anxiety reduction and stress reactivity
* has a moderate-to-large beneficial effect on mild to moderate depression
* has a small effect on self-esteem and a moderately favourable effect on self-perceptions, mood and psychological wellbeing.
* has been associated with positive effects on selected measures of cognitive function and psychological adjustment
* Academic Achievement**.** It has also been tentatively suggested that children and young people who are aerobically fit appear to have higher academic scores. The intensity and duration of exercise have been loosely linked to improved academic performance.

**The Current Study**

**Rationale**

The current study was designed to build on an initial pilot study designed to examine any possible links between an involvement in sport at school, psychological wellbeing, mental toughness (character) and academic performance.

**The Extended Sample**

After gaining ethical approval data was obtained from 1482 year 12 students from independent schools. There were 60% males and 33% females, with 7% preferring not to say. Nineteen schools took part in this study.

**The Measures Used**

In addition to basic demographic identifiers, information was obtained on:

* Academic Performance: GCSE’s and MidYIS
* Character: Mental Toughness (MTQ18)
* Psychological Wellbeing: 5 Items
* Involvement in sport
* Involvement in other extracurricular activities

**Academic Performance Data**

Two measures were used. An aggregated measure of average GCSE performance (*points allocated for each grade/number of GCSE’s*) and MidYIS.

* Mean MidYIS score was 111.5 (n=721)
* Mean MidYIS constituent sub-scale scores were also obtained
	+ Vocabulary 113
	+ Maths 116
	+ Non verbal 113
	+ Skills 110
* Mean GCSE score was 6.9 (n=697)

**Participation in Sports and other activities**

A wide range of sports were participated in. The dominant activities were: Football; Badminton; Cricket; Gym; Hockey; Netball; Rugby and Tennis. The average number of hours spent in school on these was 4.2. The average number of hours outside school was 3.4.

The main extra-curricular activities were Music and Drama. The average number of hours completed within school was 2.6 hours. The average number of hours outside school was 2.2 hours.

Fifty-five percent of the students reported that at least one of their parent was actively involved in sports on a regular basis.

**The Results**

Students were asked to give a subjective rating of the amount of time they participated in sports. These are reported in Table 1a and Table 1b.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 1a: How involved in sports WITHIN school are you?**

|  |  |
| --- | --- |
| Not at all involved | 8% |
| A little involved | 24% |
| Quite Involved | 18% |
| Involved | 22% |
| Very Involved | 28% |

**Table 1b: How involved in sports OUTSIDE school are you?**

|  |  |
| --- | --- |
| Not at all involved | 17% |
| A little involved | 24% |
| Quite Involved | 22% |
| Involved | 20% |
| Very Involved | 17% |

Students were asked how their involvement in sport impacted on their school work. This is reported in Table 1c.**Table 1c. Overall do you think your sports involvement has**

|  |  |
| --- | --- |
| Negatively impacted on my school work | 5% |
| Positively impacted on my school work | 44% |
| Had no impact | 36% |
| Don’t know | 15% |

 |
|  |

 Students participated in a number of extra-curricular activities. These are reported in Table 2a and Table 2b

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 2a: How involved in non-sport activities WITHIN school are you?**

|  |  |
| --- | --- |
| Not at all involved | 33% |
| A little involved | 25% |
| Quite Involved | 18% |
| Involved | 19% |
| Very Involved | 5% |

**Table 2b: How involved in non-sports activities OUTSIDE school are you?**

|  |  |
| --- | --- |
| Not at all involved | 36% |
| A little involved | 31% |
| Quite Involved | 18% |
| Involved | 8% |
| Very Involved | 7% |

Students were asked how their involvement in non-sport activity impacted on their school work. This is reported in Table 2c**Table 2c. Overall do you think your non-sports activity involvement has**

|  |  |
| --- | --- |
| Negatively impacted on my school work | 3% |
| Positively impacted on my school work | 50% |
| Had no impact | 30% |
| Don’t know | 17% |

 |
|  |

**The Measurement of Mental Toughness**

An 18 item questionnaire was used to measure toughness/character (MTQ18). Questionnaire data was obtained from 1363 students. The mean score was 60.2.

The mental toughness scores (the total; of each of the 18 items) obtained are roughly equivalent to data obtained from a larger study of independent schools recently undertaken.

**The Measurement of Psychological Wellbeing**

Five questions were utilised. The individual items are reported in tables 3a to 3e. An aggregated measure of wellbeing was utilised in the final analysis. This was a summation of all five items.

**Table 3a: In most ways my life is close to the ideal**

|  |  |
| --- | --- |
| Strongly Disagree | 7% |
| Slightly Disagree | 15% |
| Neither Agree or Disagree | 20% |
| Slightly Agree | 22% |
| Agree | 27% |
| Strongly Agree | 9% |

**Table 3b: The conditions of my life are excellent**

|  |  |
| --- | --- |
| Strongly Disagree | 2% |
| Slightly Disagree | 7% |
| Neither Agree or Disagree | 14% |
| Slightly Agree | 18% |
| Agree | 38% |
| Strongly Agree | 21% |

**Table 3c: I am satisfied with my life**

|  |  |
| --- | --- |
| Strongly Disagree | 4% |
| Slightly Disagree | 9% |
| Neither Agree or Disagree | 13% |
| Slightly Agree | 20% |
| Agree | 36% |
| Strongly Agree | 18% |

**Table 3d: So far I have got the important things I want in life**

|  |  |
| --- | --- |
| Strongly Disagree | 5% |
| Slightly Disagree | 12% |
| Neither Agree or Disagree | 15% |
| Slightly Agree | 23% |
| Agree | 31% |
| Strongly Agree | 14% |

**Table3e: If I could live my life over, I would change almost nothing**

|  |  |
| --- | --- |
| Strongly Disagree | 13% |
| Slightly Disagree | 23% |
| Neither Agree or Disagree | 18% |
| Slightly Agree | 18% |
| Agree | 19% |
| Strongly Agree | 9% |

**Investigating possible links with academic performance**

One of the key areas for this study was exploring any links between physical activity and academic performance. Previous research has been equivocal, with little solid evidence of a specific link between physical activity and academic performance (e.g. Singh et al, 2012; Biddle & Azare, 2011; Booth et al, 2014).

In the current study aggregated GCSE data and MidYIS scores were used. Negligible correlation coefficients were observed between sporting and non-sporting activities in relation to either of these. **No relationships approached significance, showing there was no simple discernible link between activity and academic performance**. Separate analyses were carried out by gender. Again no simple relationships could be detected.

A final analysis was undertaken, examining the link between MidYIS and GCSE performance. It was possible to examine discrepancies between potential performance (MidYIS) and actual performance (GCSE’s). Again no link was found with physical activity.

**Mental Toughness, Wellbeing and Performance**

There was a complex link between mental toughness and wellbeing with performance. In summary the lowest performing group of students had the lowest levels of mental toughness and wellbeing.

**Table 4a: A comparison of actual GCSE performance (categorised into 4) with Wellbeing**

|  |  |
| --- | --- |
|  | Well Being Score |
| Lowest Performing Group | 19.3 |
| Low Middle | 20.7 |
| High Middle | 20.8 |
| Best Performing Group | 20.3 |

**Table 4b: A comparison of GCSE performance (categorised into 4) with Toughness**

|  |  |
| --- | --- |
|  | Mental Toughness |
| Lowest Performing Group | 59.7 |
| Low Middle | 62.4 |
| High Middle | 61.6 |
| Best Performing Group | 62.2 |

This fits a ‘classic pattern’ with the very lowest performers having the very lowest wellbeing and mental toughness scores. So although physical activity does not link directly with performance it may do so via the wellbeing and toughness of students.

**The ‘Squeezed Middle’.**

A comparison of the MidYIS scores, categorised into 4 groups produces a different and very interesting set of results suggesting a squeezed middle.

**Table 4c: A comparison of MidYIS performance (categorised into 4) with Wellbeing**

|  |  |
| --- | --- |
|  | Well Being Score |
| Lowest Performing Group | 20.3 |
| Low Middle | 18.9 |
| High Middle | 20.6 |
| Best Performing Group | 20.1 |

**Table 4d: A comparison of MidYIS performance (categorised into 4) with Toughness**

|  |  |
| --- | --- |
|  | Mental Toughness |
| Lowest Performing Group | 61.2 |
| Low Middle | 58.2 |
| High Middle | 61.2 |
| Best Performing Group | 61.1 |

Taken together, this data suggested the most ***vulnerable*** group are the pupils in the Low/Middle performance group. This lower wellbeing and mental toughness may inhibit them reaching their full potential.

**The Super–Performers**

A more speculative analysis was carried out comparing the top 5% academic performers with the rest of the student population. This small and atypical sub-group had higher wellbeing, higher levels of mental toughness and a greater involvement in sport.

**The link between physical activity and mental toughness**

As previously reported there is no simple and linear relationship between mental toughness and performance, however it is important to recognise that mental toughness development in its own right might be a sought after outcome in the educational system.

There has been a recent increase in interest about character development in young people. Character is however, poorly defined. Mental toughness has been linked closely with character. Clough et al. (2002) conceptualised mental toughness as a global construct that can manifest in any area of life, including personal relationships, vocational endeavours and sport. Mental toughness is a positive psychological variable, relating to success and has properties that are beneficial for it goes beyond accepting and dealing with anxiety.  Rather it is actually seeking out, and thriving, in anxiety eliciting situations. Mental toughness enables individuals to cope with stress effectively but it also allows them to *proactively* seek out opportunities for self-development rather than just *react*to stressful circumstances. Self-beliefis the primary and most important attribute of mental toughness.  It manifests itself, and is the product of, physiological, cognitive and behavioural differences.

It has been suggested that sporting involvement can be a vehicle for the development of mental toughness (e.g. Crust and Clough, 2011). More recently, Clough et al (2016) have suggested outdoor adventure activities as a route to mental tough ness development.

**The findings**

Firstly, it is worth noting that there were no links were found between an involvement in extracurricular activities and mental toughness

Significant relationships were found between sports’ involvement and mental toughness. The level of sports involvement was associated with higher toughness scores

* ***Sports involvement in school vs MT r=0.19 p<0.001***
* ***Sports involvement outside school vs MT r=0.21 p<0.001***

It is possible to say that around 7% of students’ mental toughness scores is explained by their involvement in sports, suggesting that sport can be a significant factor in the building of character building.

**The link between physical activity and wellbeing**

Few studies have examined this area within a school setting. The psychological wellbeing of students has become a key issue both in educational establishments and in governmental policy. It is often reported that 1 in 10 of children and young adults have significant mental health issues. The data from the current study, reported in Tables 3a to 3e are suggestive of a similar percentage in the schools taking part in this study (*however, it should be noted that that the wellbeing measures utilised here are not validated for clinical populations*).

There is some previous research in this area. Steptoe and Butler (1996) reported data from a cohort of 5,061 adolescents. They noted that ‘greater participation in vigorous sports and activities was associated with lower risk of emotional distress’. Allison et al (2005) analysed data from 2,104 Canadian adolescents and showed a significant negative relationship between sports involvement and problems with social functioning.

In the current study positive associations were found between sports activities and wellbeing

***Sports involvement in school vs Wellbeing r=0.21 p<0.001***

***Sports involvement outside school vs wellbeing r=0.19 p<0.001***

It is possible to state that ***6%*** of wellbeing is predicted by an involvement in sport.

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**The link between mental toughness and wellbeing**

There is a growing body of evidence examining the link between mental toughness and wellbeing. For example, Gerber, Brand, et al. (2013) employed a longitudinal design to explore the association between MT with perceived stress and depressive symptoms. Levels of perceived stress were assessed to estimate adverse life experiences; depressive symptoms and life satisfaction were assessed to estimate overall levels of adjustment (representing maladaptive and adaptive emotional development, respectively). In a sample of 865 students at vocational schools, both stress and depressive symptoms negatively correlated with the scores on the short version of the MTQ48. Also MT was positively related to life satisfaction.(Gerber, Brand, et al., 2013). Gerber, Kalak, et al. (2013) showed that overall MT, was associated with lower perceived stress and fewer depressive symptoms in a sample of 284 high school students and in a sample of 140 undergraduate students. They also showed that MT moderates the relationship between high stress and depressive symptoms.

These findings are supported by the data obtained in the present study. There was a very strong association between mental toughness and wellbeing

***MT vs Wellbeing r=0.53 p<0.001***

*Around 30% of the wellbeing scores noted here are predicted by the mental toughness measure.*

**Summary of the findings**

* It does appear that an involvement in sport whilst at school is advantageous.
* Sports involvement does not appear to have any negative implications.
* An involvement in sport is linked to greater character development AND psychological wellbeing.
* Many pupils, but not all, felt that sports participation was related to improvements in school work. This may be an overly positive view of what is actually happening, as there is only limited evidence that involvement in sport has a positive impact on academic performance.
* There was a clear link between mental toughness and wellbeing. This suggests, in conjunction with the extant literature, that toughness may be a moderator of the relationship between sport and wellbeing.
* There are groups that are perhaps particularly vulnerable, for example the ‘Squeezed Middle’ and Poor Performers. An involvement in sport may offer a mechanism to allow these students to reach their full potential.

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