



Personality and Sport: An investigation into whether personality traits can predict behaviour in people participating in competitive sport.

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ABSTRACT

Investigating a possible link between personality and behaviour in sport was this studies primary aim. In particular, it investigated whether certain personality traits could predict aggressive behaviour in people who participate in competitive sport. The personality traits used as predictors were mental toughness (MTQ18), fear of failure (PFAI), extroversion and neuroticism (BFI), which were measured against participant's scores of competitive aggression (CAAS). Results were recorded in a self-reported 71-item questionnaire. The objective of the study was to better inform possible interventions for mental health coaching in sport, to reduce negative behaviour. The sample of 120 participants consisted of a range of genders, ages, sporting ability and sporting types. Although the results showed that mental toughness and fear of failure may be a predictor of aggression, neuroticism and extroversion did not. The results therefore did not strongly support the research hypothesis. Upon further analysis of the results, a strong correlation was shown between mental toughness and other personality variables. It was therefore decided to create a secondary research aim, investigating this relationship. A linear regression analysis was performed, which revealed that mental toughness scores predicted positive extroversion traits ($t(118) = 6.11, p < .001$) and negative neuroticism traits ($t(118) = -8.31, p < .001$) within participants. This suggests a possible link between an individual's mental toughness capability, and how it effects their personality. Further research into this is required, however this study helped to gain insight into possible interventions for psychological coaching, with a focus on mental toughness, to improve athletes behaviour.

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|------------|------------|-------------|-------------------|------------------|-----------------|
| KEY WORDS: | AGGRESSION | PERSONALITY | COMPETITIVE SPORT | MENTAL TOUGHNESS | SPORT BEHAVIOUR |
|------------|------------|-------------|-------------------|------------------|-----------------|

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| | |
|---|----|
| Contents | |
| Introduction | 5 |
| Mental Toughness | 6 |
| Fear of failure | 6 |
| Competitive Aggression | 7 |
| Justification for Research | 7 |
| Research Question 1 | 8 |
| Research Hypothesis 1 | 8 |
| Research Question 2 | 8 |
| Research Hypothesis 2 | 9 |
| Method | 9 |
| Design | 9 |
| Participants | 9 |
| Materials | 10 |
| The Big 5 Inventory (BFI) | 10 |
| Mental Toughness Questionnaire- 18 (MTQ18) | 10 |
| Competitive Anger Aggression Scale (CAAS) | 10 |
| Performance Failure Appraisal Inventory (PFAI) | 11 |
| Procedure and Ethical Considerations | 11 |
| Results | 13 |
| Preparation of Data | 13 |
| Reliability Analysis | 13 |
| Descriptive Statistics | 14 |
| Correlations | 14 |
| Regression 1 | 15 |
| Regression 2 | 17 |
| Discussion | 19 |
| Summary of Findings | 19 |
| Research Question 1 | 19 |
| Research Question 2 | 21 |
| Implications | 21 |
| Self-reported Questionnaires | 21 |
| Issues with Studying Aggression | 22 |
| Critique of CAAS | 22 |
| Limitations and Future Research | 23 |
| Study Sample | 23 |
| Rethinking Methodology | 23 |
| Future Research | 24 |
| Conclusion | 24 |
| References | 25 |

Introduction

Personality is a very popular research area within psychology, concerned with how certain personality traits affect individual's behaviour. When investigating behaviour in sport, however, the majority of research looks at the effects of physical exercise from a health point of view. In particular, research is hypothesised towards personality effecting the quality of exercise and a person's behaviour towards health practices (Eklund & Tenenbaum, 2014). More recently however, there has been a significant increase in interest in sports psychology and the behaviour of people who participate in exercise and sporting activities (Biddle & Mutrie, 2008). Conversely, little research can be found linking particular behaviour in sport to personality traits. This study aims to investigate a possible link between personality traits, and the effect it has on behaviour in people who compete in competitive sport, focusing on predictors of aggression.

Personality effects performance in a number of different competitive situations. Whether it is work, academic or sport, people vary in their ability to perform under stressful, high pressured and competitive situations. This in turn, varies the outcome of how they deal with these circumstances (Allen & Ladorde, 2014). As competitive sporting events are associated with high pressure, they are often allied with aggressive behaviour. It is suggested that personality should affect behaviour through attitudes, subjective norm and perceived behavioural control (Eklund & Tenenbaum, 2014). However, when people believe it is normal to act aggressively in stressful situations, or they lack the behavioural control to stop themselves acting in an aggressive manor, the negative outcome will reflect on both them and people around them. Huesmann (1998) states that the beliefs an individual holds about the appropriateness of aggressive behaviour as a social response are referred to as Aggression-supportive normative beliefs (Hosie, Gilbert, Simporon & Daffern, 2013). These normative beliefs can develop from a number of different attributes within an individual, one of them being personality.

The assumption that aggression is a learned behaviour, which is cognitive and automatic, is believed to be false by Ferguson & Dyck (2012). Alternatively, it is argued that the assumption that predictors such as genetics, personality and environmental factors effect aggression is much stronger (Ferguson, 2007; Ferguson & Dyck, 2012). This therefore calls for studies exploring the relationship between personality and aggression to be conducted.

Neuroticism and Extroversion

The Big 5 has been identified as a predominant model of personality (Barlett & Anderson, 2012). A study conducted by Sanz, Garcia & Magan (2010) explored the relationship between both constructs and their scales. It also showed a strong correlation between neuroticism and trait anger (Sanz et al., 2010). Many studies, including one conducted by Barlett & Anderson (2012) have explored the direct and indirect relationship between The Big 5 and aggressive behaviour. However, for this study, it is believed to be more informative to explore individual personality factors within The Big 5, rather than as a whole. Therefore, neuroticism and extroversion have are used as predictor variables of aggression, and their individual scales taken from The Big 5 Inventory (BFI) (Goldberg, 1993). Neuroticism shows a number of strong links with aggressive behaviour. Sanz, Garcia- Vera & Magan (2010), showed support of this. Their study found that neuroticism was primarily associated with trait anger. In contrast, links between extroversion and aggression have not been found, as it is believed to be a personality trait that shows warmth towards other (Lucas, 2007). The reason for its use in this study is due to its impulsive, assertive and excitement- seeking nature (Lucas, 2007). Correlations may be shown when explored with aggression as an individual personality trait, rather than as part of the broader Big 5.

Mental Toughness

Mental toughness questionnaires are regularly used in sports coaching, with the aim of coaching improvements. To be an excellent athlete does not just depend on physical ability, but also mental skills. Mental toughness is not seen as the outcome, but instead the mental process in which human behaviour is guided. (Gucciardi & Gordon, 2012). In sport winning would not be the outcome, but instead the mental process of how the individual deals with winning and losing, and the effect that has on behaviour. When exploring the frustration-aggression hypothesis (Dollard, Doob & Miller, 1939), it is suggested that if people are not mentally tough to deal with the concept of not reaching their goal or performing to an 'excellent' standard, this may trigger frustration, resulting in an aggressive outcome.

“an instinct to engage in combat is activated by any obstruction to the persons smooth progress towards his or her goal.” (Baumeister & Vohs, 2007:365)

Fear of failure

This notion strongly links with fear of failure. The pressure to perform within sports strongly exists, producing and increase in fear of failure amongst athletes (Correia, Rosado & Serpa, 2016). Fear of failure is separated into five sub sections. These include; fear of shame and

embarrassment, fear of devaluing ones self-estimates, fear of having uncertain future, fear of important others losing interest, and fear of upsetting important others (Conroy, 2002). The revised 25-item Performance Failure Appraisal Inventory (PFAI) covers all of these sun sections, making it possible to assess each domain individually, to pin point a specific cause of an individual's fear and resulting behaviour. The PFAI was used in a cross cultural study, assessing the correlation between fear of failure and sport anxiety in 2016 by Correia et al. A relationship was found between sport anxiety and fear of failure. There is limited research currently exploring fear of failure and aggression, therefore this study aims to investigate a possible relationship using the PFAI alongside the Competitive Anger Aggression Scale (CAAS) (Maxwell & Moores, 2007). Referring back to the frustration- aggression hypothesis (Dollard, Doob & Miller, 1939) it is predicted that a correlation will be present due to the indication that the closer you get to your goal, and the fear of losing that goal, the more frustrated a person may become. As a result this frustration may be expressed through aggressive behaviour towards team mates, opponents, coaches or umpires.

Competitive Aggression

Questions exploring whether the participant believes it is acceptable to use aggression towards others is measured within the CAAS (Maxwell & Moores, 2007). An example of an item from the questionnaire is:

"I verbally insult opponents to distract them"

The CAAS has been used in a study exploring the differences in contact and non-contact sport, and levels of aggression (Safraoui, 2014). It showed a significant difference using the CAAS in self-reported aggression between the two, with contact sport showing higher levels. The CAAS was also found to be valid and reliable measure in competitive aggression; therefore it was used in this study. However, it is not used as measure between contact and non-contact sports. Instead it will be compared with personality traits previously cited (extroversion, neuroticism, mental toughness and fear of failure) to see if there is a relationship when exploring predictors of aggression. Differences in sport has not been noted in this study, but instead competitive sport is used as whole notion.

Justification for Research

Sport may be seen as a healthy catharsis for the release of anger. Yet, it is argued that aggressive impulses do not lead to a catharsis but instead to a vicious cycle of further aggression (Morlan, 1949). Consequently, sport may not resolve any aggressive tendencies, but instead exaggerate them. This may be emphasized if the individual believes it is

acceptable to behave in an aggressive manner, or there are no attempts to reduce aggression in sport. That is why investigation into sport aggression, its causes, and resolutions, can be important both for the individual, the team, and opponents. This study focuses on a possible cause of aggression that is not widely studied in sport. Thus, if a relationship is found between personality traits and aggressive behaviour, it can help to improve psychological coaching within competitive sport, to try to eliminate this negative behaviour.

Research Question 1

Can personality traits predict aggression in sport?

Research Hypothesis 1

High levels of Neuroticism will predict aggression

High levels of Extroversion will predict aggression

High levels of Fear of Failure will predict aggression

Low levels of mental toughness will predict aggression

Research Question 2

Following the results from the correlation matrix, it was decided to add in an extra research question. This was due to mental toughness correlating with all other variables. Upon this discovery, further research into the relationship between mental toughness and personality was conducted. According to previous research, there is a link between certain personalities and mental toughness. When the Big Five Inventory was correlated with MTQ-18 (Clough et al, 2002) by Delaney, Goldman, King & Nelson-Grey (2014), it showed that the BFI scale predicted scores on the MTQ-18. It was shown that the neuroticism scores, negatively correlated with MTQ-18 scores ($-.74, p < .001$), while extroversion scores positively correlated with MTQ-18 scores ($.37, p < .001$). A broad view of this suggests that mental toughness may be affected by personality traits (Goldman et al., 2014).

Mental toughness can be defined as:

“ ... a personality trait which determines, in some part, how individuals perform when exposed to stressors, pressure and challenge irrespective of the prevailing situation.”
(Clough & Strycharczyk, 2011)

People who are highly responsive to stress are more likely to score highly on neuroticism, and are seen as less stable in their recovery after suffering a high pressure situation (Jarvis, 2006). On the other hand, extroverts require more stimulation, and therefore seek out high arousal activities, such as competitive sport. This makes them more lively and sociable (Jarvis, 2006). As mental toughness is believed to involve characteristics like resilience, confidence, commitment, and self-belief (Goldman et al., 2014), it is a plausible belief that

high and low levels of mental toughness will have opposite effects on an individual's personality, due to the characteristics that personality traits such as neuroticism and extroversion hold.

Therefore, a second linear regression was ran to further investigate the relationship between the personality traits neuroticism and extroversion, to see if they were effected by levels of mental toughness.

Can mental toughness predict personality traits?

Research Hypothesis 2

Mental toughness will have a positive prediction of extroversion.

Mental toughness will have a negative prediction of neuroticism.

Method

Design

This study is a correlation survey design. A multivariate linear regression analysis was performed using SPSS to investigate relationships between the DV and IV's.

Research Question 1:

DV= Aggression

IV= Mental Toughness, Extroversion, Neuroticism, Fear of Failure.

Research Question 2:

DV= Neuroticism, Extroversion

IV= Mental Toughness

All participants will be asked to complete the same questionnaire containing 71 items across all variables. All items within the questionnaire have been taken from The Big 5 Inventory (BFI- see appendix 1), The Mental Toughness Questionnaire (MTQ-18- See appendix 2), Competitive Anger and Aggression Scale (CAAS- see appendix 3) and The Performance Failure Appraisal Inventory (PFAI- see appendix 4).

Participants

The total number of participants that took part in this study was 120. The number of participants required was calculated using Green (1991) calculation of $104 + k$ (where k is the number of predictor variables), the minimum requirement of 108 was reached. No vulnerable participants took part and all participants were over the age of 18. Participants were recruited through opportunity sampling. The link to the questionnaire was published in

a private Facebook group containing students and workers at Manchester Metropolitan University. All information regarding the study was on the introduction to the Qualtrics questionnaire. This information included the participant information sheet (see appendix 8), the participant invite sheet (see appendix 9), followed by the questionnaire (see appendix 5 for a copy of questionnaire, with Likert scale scoring). All participants will be made aware of true aims of the study before beginning the questionnaire to be certain they wish to participate in the study. The questionnaire concluded with a debrief form where participants were able to create the unique code (see appendix 11).

Materials

All data was gathered by means of a questionnaire, which comprised of a number of scales for each variables. Altogether, the questionnaire included 71 items, plus demographic information including gender and age group. Each item was measured using a 5-point Likert scale.

The Big 5 Inventory (BFI)

The extroversion and neuroticism items were taken from The Big 5 Inventory (BFI- see appendix 1). The Big 5 Inventory is a 44-item questionnaire that measures an individual on different dimensions on personality. The traits included are, Extraversion, Openness, Neuroticism, Agreeableness and Conscientiousness. For this study, the only items concerning Extraversion and Neuroticism were used. Both extroversion and neuroticism contained six items each.

Mental Toughness Questionnaire- 18 (MTQ18)

Mental toughness has been assessed using the Mental Toughness Questionnaire- 18 (MTQ18 -see appendix 2). The shortened version of the MTQ, comprised of 18 items will be used in this study. This measures mental toughness as a whole construct, not separating into the 4 C's as the revised MTQ48 does. The reason for this is limited accessibility to the MTQ48. However, this study aimed to investigate mental toughness as a single personality trait, and the MTQ18 covers all aspects of this.

Competitive Anger Aggression Scale (CAAS)

Aggression was investigated through the Competitive Anger Aggression Scale (CAAS- see appendix 3), which is made up of 12 items assessing both anger and aggression. The anger items cover how people feel while competing, alongside aggression items that cover how people feel towards other people while competing, while also assessing whether they believe aggressive behaviour is acceptable during sport. All 12 items were used in this study,

however they were not split into anger and aggression. Instead, aggression as a whole will be assessed using all 12 items.

Performance Failure Appraisal Inventory (PFAI)

The Performance Failure Appraisal was used to assess fear of failure Inventory (PFAI- see appendix 4). The original PFAI consists of 89 items that were believed to be linked to fear of failure. However, the revised PFAI comes in either a long 25-item form, or an short form consisting of 5 items. For this study the 25-item PFAI was be used. This assesses fear of failure under 5 different sub areas, Fear of Experiencing Shame & Embarrassment, Fear of Devaluing One's Self-Estimate, Fear of Having an Uncertain Future, Fear of Important Others Losing Interest, Fear of Upsetting Important Others. It can also be used as a measure for fear of failure as a whole. That is how it was used in this study, so fear of failure can correlated with aggression.

The CAAS, PFAI and BFI were available online, no authorisation from the author was required. Authorization for use of the MTQ18 was granted from the author, Professor Peter Clough.

Procedure and Ethical Considerations

The process of data collection began with all participants being invited to partake in the study, via a link shared in a closed Facebook group for MMU staff and students. This invited included information regarding the study aims of the study, as well as what they will be required to do (see appendix 9). The invite also included a link to Qualtrics. Before they begin to fill out the questionnaires however, full consent was explained and gained via the consent form (see appendix 10) on the introduction to the Qualtrics questionnaire. Alongside this was information on the participant's right to withdraw at any stage of the process, up until data analysis will begin on the 1st February 2017. Upon completion of the questionnaire, a debrief form (see appendix 11) was available for all participants to read, explaining write to withdraw, participant confidentiality, and a box for them to complete to create their unique confidential participant code. All completed questionnaires were gathered ready for analysis by the 1st February 2017.

Full ethical approval was gained before any data was collected which adheres to the ethical guidelines outlined by the British Psychological Society (BPS) as well as complying with Manchester Metropolitan University's Academic Ethical Framework and the University's Guidelines for Good Research Practice.

No vulnerable participants were used in this study as they are all aged 18 or over. No participants were misled throughout any stage of the study. All true study aims were provided

before and during data collection. Participants were given the right to withdraw throughout the research process, no reason required. They will be able to do this via their unique participant code which keeps confidentiality of the participant. Gender and Age of participants were asked, however, to further ensure confidentiality of all participants is kept, no personal information was asked at any stage of data collection. Participants are identified by unique code only.

As this research aims to explore predictors of aggression, topics of aggression and anger were touched on, however participants were not required to recall specific events, and no specific details was required. All questions are a general self-reported assumption regarding what that participant believes around the subject of their aggression. No other sensitive subjects are mentioned at any stage. This study does not at any point, put participants under any harm or into potentially harmful or stressful situations. In the debrief of the process, participants were provided with details of MMU counselling, if they may require any assistance with any topics discussed in this study, or any other issues they may need help with (see appendix 11).

As there is no risk to participant or activity that may cause harm or distress, no risk assessment was conducted. However, the Application for Ethical Approval form was completed (see appendix 6), alongside a research insurance checklist prior to data collection (see appendix 7).

Where gender is requested within the questionnaire, the new guidelines set out by BPS have been adhered to. This includes new options for participants, as shown below:

Gender:

- Female
- Male
- Non-binary
- Third gender
- Prefer to self-describe _____
- Prefer not to say

Results

Participant's responses were exported from Qualtrics into SPSS for further analysis. (see appendix 13-17 for SPSS raw output data)

Preparation of Data

Before analysis began, all scales were prepared from raw data on SPSS. Firstly, all items were reversed if needed.

MTQ18 reversed items: Q2, Q3, Q6, Q8, Q9, Q11, Q12, Q16, Q17.

The Big 5 reversed items: Extroversion Q6, Q21, Q31. Neuroticism, Q9, Q24, Q34.

(Question numbers from original questionnaire. See appendix 1 & 2)

Following reliability analysis of each item, scale totals for all measures were calculated in preparation, by adding scores from each item within the measure. The scale total were then used in the correlation and regression analysis.

Reliability Analysis

Internal consistency analysis were conducted on all measures and Cronbach's alpha's can be seen in Table 1.

Table 1

Cronbach's Alpha (internal consistency) for Aggression, Fear of Failure, Extroversion, Neuroticism and Mental Toughness (N = 120)

| Measures | Number of items | Cronbach's alpha | 95% Confidence Interval for alpha | |
|------------------|-----------------|------------------|-----------------------------------|-------|
| | | | Lower | Upper |
| Aggression | 12 | .82*** | .77 | .87 |
| Neuroticism | 8 | .66 | .56 | .74 |
| Extroversion | 8 | .83*** | .78 | .87 |
| Mental Toughness | 18 | .66*** | .56 | .74 |

| | | | | |
|-----------------|----|--------|-----|-----|
| Fear of Failure | 25 | .87*** | .84 | .90 |
|-----------------|----|--------|-----|-----|

Note: F test with true value = .7, * $p < .05$. ** $p < .01$. *** $p < .001$

Following internal consistency analysis, Cronbach's Alpha for the 18 item Mental Toughness scale was .66, 95% CI [.56, .74] which is below the generally accepted level of .7. Although the Mental Toughness did not have a reliability score above the test value of .7, it was still used in further analysis due to being close to the acceptable test value.

Descriptive Statistics

Means and standard deviations were calculated for each of the measures used (Table 2).

Table 2

Descriptive Statistics for Aggression, Fear of Failure, Extroversion, Neuroticism and Mental Toughness (N = 120)

| | Mean | SD |
|------------------|-------|------|
| Aggression | 39.32 | 7.53 |
| Neuroticism | 23.23 | 4.47 |
| Extroversion | 20.87 | 6.06 |
| Mental Toughness | 48.99 | 7.10 |
| Fear of Failure | 71.52 | |

Correlations

A series of Pearson's bivariate correlations were conducted between all scales used in this study and can be seen in Table 3.

Table 3

Pearson Correlation Matrix among Variables Related to Aggression (N =120)

| | Aggression | Neuroticism | Extroversion | Mental Toughness | Fear of Failure |
|------------------|------------|-------------|--------------|------------------|-----------------|
| Aggression | - | .32 | .05 | .23* | .27** |
| Neuroticism | .03 | - | -.39** | -.61** | .45** |
| Extroversion | .05 | -.39** | - | .49** | -.32** |
| Mental Toughness | .23* | -.61** | .49** | - | -.46** |
| Fear of Failure | .27** | .45** | -.32** | -.46** | - |

* $p < .05$. ** $p < .01$. *** $p < .001$, one-tailed.

From the correlation matrix, it was shown that only mental toughness and fear of failure significantly correlated with aggression. These were therefore used in further regression analysis to gain more insight into this relationship. Upon further investigation of the correlation matrix it was found that all variables correlated with mental toughness. It was then decided to run a second regression analysis, with mental toughness as the predictor variable and neuroticism and extroversion as the criterion variables. This was to investigate whether mental toughness may be effected by certain personality traits, and gain further insight into why mental toughness showed significant correlations with all personality traits shown.

Regression 1

A linear multiple regression was conducted using mental toughness (MTQ18 scores) and fear of failure (PFAI scores) as predictor variables and aggression (CAAS scores) as the

criterion variable. Using the 'enter' method, a significant model emerged ($F(2,118) = 17.62$, $p < .001$). The relationship between the variables was strong ($R=0.48$) and the model could explain approx. 23% ($adjusted R^2 = 22.0\%$) variance in aggression scores. Out of the variables, fear of failure was the strongest predictor of aggression ($t(118)=5.22$, $p < .001$: 95% CI 0.18 – 0.40), followed by mental toughness ($t(118)=4.90$, $p < .001$: 95% CI 0.28 – 0.67). The contribution of each predictor variable in accounting for the variance in aggression scores is shown in Table 4 below.

Table 4

Summary of Regression Analysis for Variables Predicting Aggression (N = 120)

| Variable | B | β | t | Sig.(p) | |
|------------------|-----|---------|------|---------|--------------------------------------|
| Mental Toughness | .48 | .45 | 4.90 | <.001 | Note: $R^2 = .23$, 23% variance. |
| Fear of Failure | .29 | .48 | 5.22 | <.001 | |

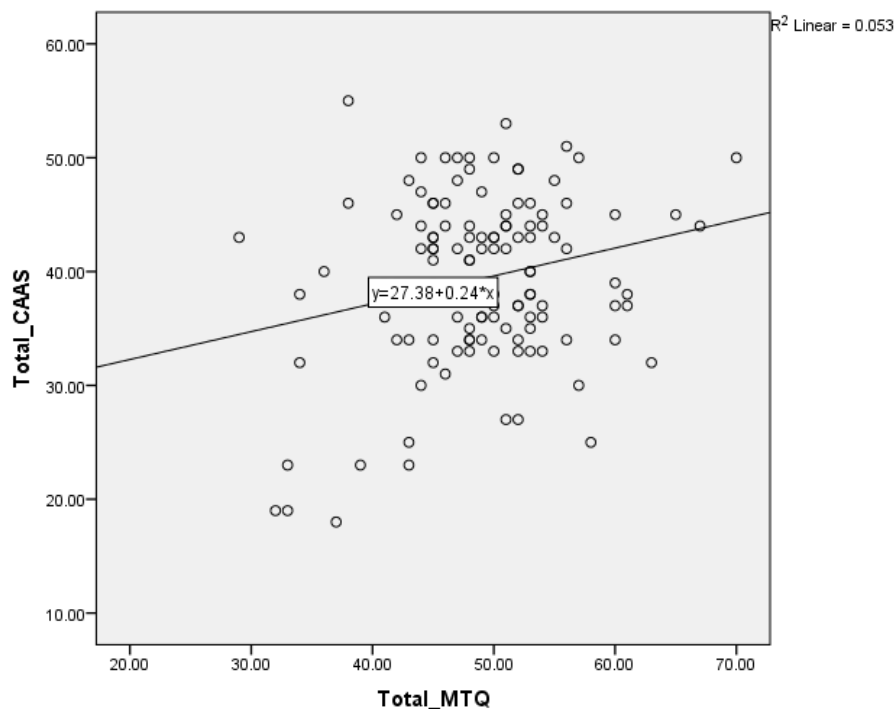


Figure 1- Scatterplot of regression with regression line showing significant positive relationship between mental toughness and aggression.

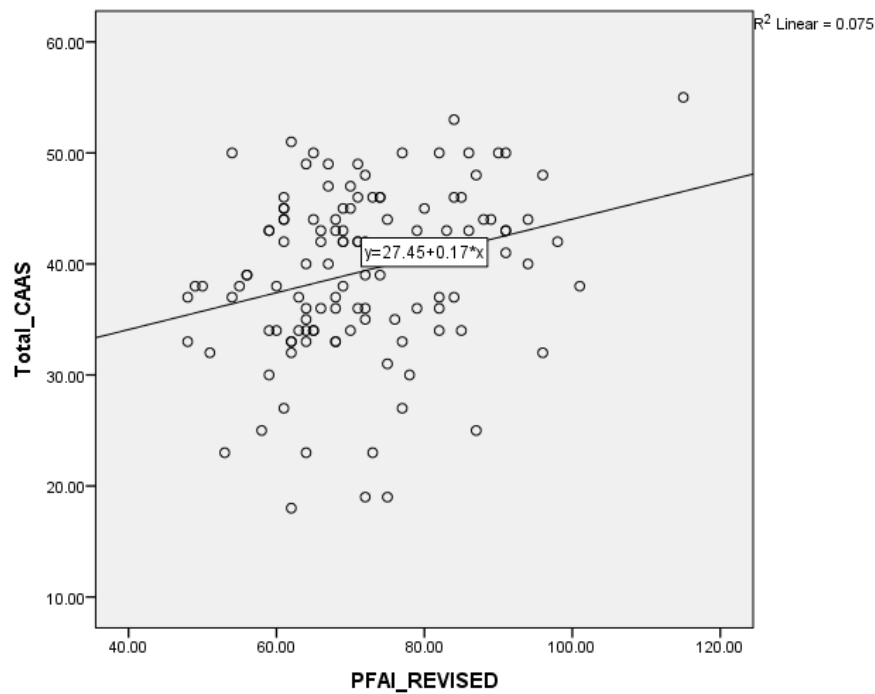


Figure 2- Scatterplot of regression with regression line showing significant positive relationship between fear of failure and aggression.

Regression 2

Following results from the correlation matrix, a second regression analysis was performed due to the significant correlations between all other variables and mental toughness. Therefore, two linear regressions were ran to see if mental toughness is a predictor of neuroticism and extroversion.

Table 5

Summary of Regression Analysis for mental toughness as predictor of neuroticism.

(N = 120)

| Variable | B | β | t | Sig.(p) |
|-------------|------|---------|-------|---------|
| Neuroticism | -.96 | -.61 | -8.31 | <.001 |

Note: $R^2 = .37$

(37% variance)

Table 6

Summary of regression analysis for mental toughness as a predictor of extroversion.

| Variable | B | β | t | Sig.(p) |
|--------------|-----|---------|------|---------|
| Extroversion | .58 | .49 | 6.11 | <.001 |

Note: $R^2 = .24$,

24% variance

Using the 'enter' method, a significant model emerged ($F(1,118) = 68.99$, $p < .001$). The relationship between the variables mental toughness and neuroticism was strong ($R=0.61$) and the model could explain approx. 37% (adjusted $R^2 = 36.6\%$) variance in neuroticism scores. Mental toughness showed to be a negative predictor of neuroticism ($t(118)=-8.31$, $p < .001$; 95% CI -0.48 – -0.29). The second regression performed using mental toughness as a predictor of extroversion showed the following. A significant model emerged ($F(1,118) = 37.27$, $p < .001$). The relationship between the variables was strong ($R=0.49$) and the model could explain approx. 24% (adjusted $R^2 = 23.5\%$) variance in extroversion scores. Mental toughness showed to be a positive significant predictor of neuroticism ($t(118)=-6.11$, $p < .001$; 95% CI 0.28 – 0.56). These results are summarised above in Table 5 and Table 6. See below scatterplots illustrating each regression further.

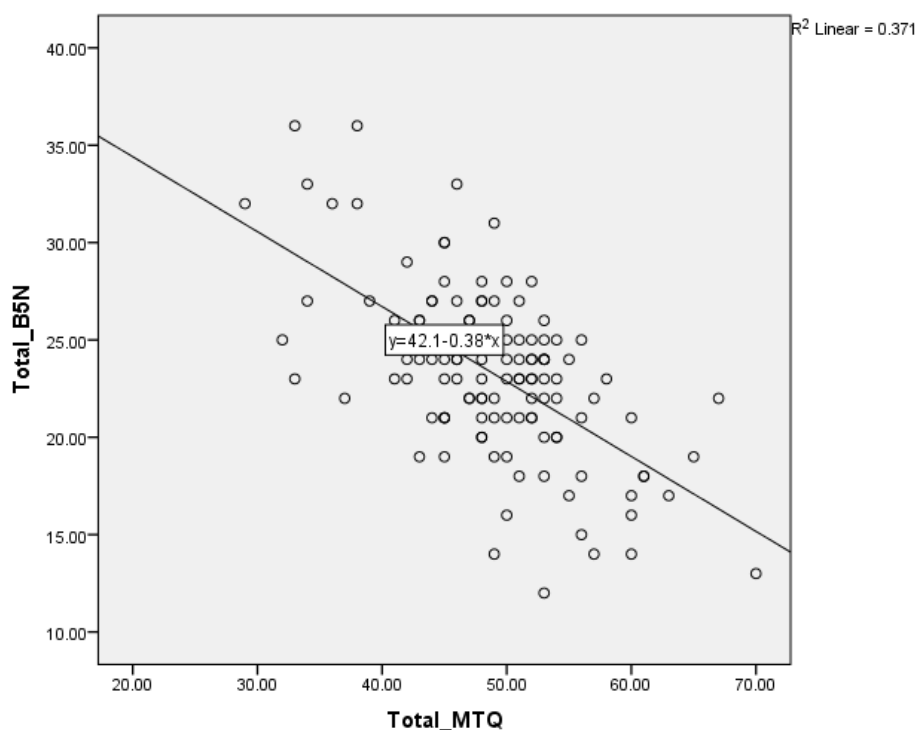


Figure 3- Scatterplot of regression with regression line showing significant negative relationship between mental toughness and neuroticism.

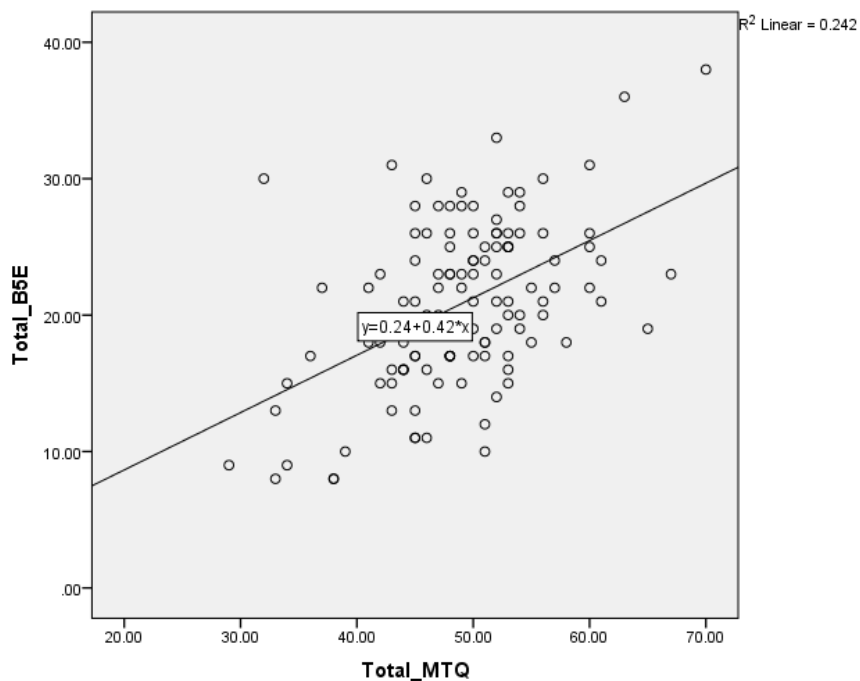


Figure 4- Scatterplot of regression with regression line showing significant positive relationship between mental toughness and extroversion.

Discussion

Summary of Findings

Research Question 1

Following analysis in SPSS, it was shown that mental toughness and neuroticism scored below the generally accepted level of 0.7. They were both, however, still used in the correlation matrix, due to the score being close to 0.7. This was also to investigate if there was a relationship between them and other measures.

The correlation matrix showed that with regards to aggression, only mental toughness and fear of failure significantly correlated. Extroversion and neuroticism did not positively correlate with aggression. As previously mentioned, extroversion is not normally associated with aggressive traits and no previous link had been found (Lucas, 2007). This is supported in this study. However, it is unknown why neuroticism did not correlate, as Sanz et al (2010) previously found a significant relationship between neuroticism and trait anger. A factor that may have effected this may be the reliability of the neuroticism scale. As it scored below the

average of 0.7, this may have had an effect on the outcome of the correlations. Also, extroversion and neuroticism are usually used as part of a larger Big 5 measure. Perhaps if the study was to be repeated, a different scale measuring these personality traits would be used.

Therefore, only mental toughness and fear of failure were entered into a regression analysis to further explain the relationship with aggression. Fear of failure was the strongest predictor of aggression, supporting the hypothesis that high levels of fear of failure would predict aggression. This was predicated using the relationship that fear of failure has with anxiety. Anxiety and aggression share relations with physiological indices of emotional regulation, this can be described through us of physical or verbal aggression (Scott & Weens, 2014). Both anxiety and aggression possess emotion driven impulses and control difficulties, making it difficult for them to control any motivation to act aggressively (Dixon, Tull, Lee, Kimbrell & Gratz, 2016). This is believed to be the same with fear of failure due to its known relationship with sport anxiety (Corria et al, 2016) and now a supported relationship with aggression from this study.

It was predicted before the analysis began that low levels of mental toughness would have a relationship with aggression. Although it shows that there is a relationship due to the two measures significantly correlating, when they were entered into a regression analysis, it showed the relationship was positively significant. This suggests that high levels of mental toughness predict aggression. This does not support this study's research hypothesis. One explanation for this may be referring back to the frustration-aggression hypothesis (Dollard, Doob & Miller, 1939). Individuals with high levels of mental toughness are believed to hold high levels of confidence and self-belief in reaching their goal. As the frustration-aggression hypothesis suggests, the closer you are to reaching your goal, the more frustrated you become (Dollard, Doob & Miller, 1939). Therefore, if an individual's belief in reaching their goal is destroyed, this may in fact lead to an aggressive outcome, no matter how mentally tough that person is. Although the hypothesis was not supported by this study, it did show a strong relationship between mental toughness and aggression that cannot be ignored, calling for further research into this relationship.

As a result of the analysis for research question 1, only one research hypothesis was supported by the results and therefore accepted:

High levels of fear of failure will predict aggression

Research Question 2

Half way through data analysis a strong correlation was shown between mental toughness and all other variables. It was felt that this relationship could not be ignored. It was therefore decided to investigate the relationship between mental toughness and extroversion and neuroticism, to see if mental toughness had an effect on these personality traits in an individual. Before the analysis began, it was predicted that mental toughness would show a strong positive effect on extroversion, while it would have a negative effect of neuroticism, as previously mentioned. The regression results supported both of these predictions, therefore the following hypothesis were accepted:

Mental toughness will have a positive prediction of extroversion.

Mental toughness will have a negative prediction of neuroticism.

This supports a notion of mental toughness not only being its own personality trait (Clough & Strycharczyk, 2011), but it having an effect on an individual's personality in other ways. This shows the importance of mental health coaching, especially in sports. Having the strength within ones personality to cope with situations seen as stressful is a key element for people competing in sport. As this study has revealed that a person's personality can be influenced by their levels of mental toughness, it shows the importance of mental toughness training for athletes. Helping them to train their personality to deal with the high pressure of competition will help them to behave positively towards the outcome, and not allow it to affect their behaviour in a negative way. (Nicholls, Polman, Levy & Backhouse, 2007)

Implications

Self-reported Questionnaires

As this study used a self-reported questionnaire exploring aggression, this may have caused implications for the results. Depending on an individual's personal beliefs, aggression may be seen as a sensitive topic. Ethics and moral desirability must be taken into account in this study and how that may have affected the results. The label of aggressive behaviour carries a negative moral connotation to many (Bredemier & Shields, 1986). This therefore may have an impact on how they respond to the questions they are faced with. Exploring to wording of questions on the CAAS, it may be possible that participants may be hesitant to admitting to certain statements. An example of this is taken from the CAAS (Maxwell & Moore, 2007).

"It is acceptable to use illegal physical force to gain an advantage"

This negative statement, combined with the use of the word “illegal” may guide people away from answering honestly in case of implicating themselves in something that is not seen as a morally acceptable. This will be emphasized if the participant has a high moral self-image of himself or herself. They may use confirmation bias when responding to the questionnaire to exaggerate what they believe of themselves, rather than how they would truly respond in that situation.

Issues with Studying Aggression

“The study of aggression in sport has suffered from problems associated with formulating an acceptable definition of aggression” (Maxwell & Moore, 2007:180)

Researching a topic that involves either implicit or explicit moral judgement, such as aggression can be difficult. The label of aggression or aggressive behaviour must be used with caution when talking about a wide range of acts. This is due to the broad definition of the term ‘aggression’. Not only does aggression not have a clear definition, but a continuum of meanings that is not clear, where both murder and verbal abuse may be placed on the same level. The notion of aggressive behaviour is subjective to each individual. What one person believes to be an act of aggressive, another may not. This may have affected the outcome of the research. (Bredemeier & Shields, 1986)

Critique of CAAS

Kerr (2008) outlined some critique of the development and use of the CAAS. The first critique was, as previously mentioned, the difficulty in defining aggression, especially in a sport setting. The scale does not give clarification on the difference between contact and non-contact sports, or legal or sanctioned aggression (Kerr, 2006). The CAAS is also accused of adopting a “one size fits all” element, ignoring other factors that may motivate aggression. This issue also is mirrored in this study. Within the sample used, there was no distinction made in both the development of the CAAS or this study to differences in sport. The sample used was across a number of different sports, which adhere to different rules. For example, tennis is a non-contact sport, whereas rugby is a contact sport consisting of legal and illegal physical force towards other players. Difference in views on physical or verbal aggression is inevitable across people part taking in these sports, which may be reflected in how the participant responds to certain questions. (Kerr, 2006)

Limitations and Future Research

Study Sample

The sample size for this study has a wide range of ages, different sporting abilities, sport types, and current and ex-players. If this study was to be repeated, a more refined sample size should be used. Perhaps using only current participants of sport would help to gain a more current view on aggression as they can remember detail that is more specific. To refine the participants into similar sporting types would also have a positive effect on the results, for example contact vs non-contact. This will help further investigation into the differences in aggression between sport, rather than using sporting as a whole. The outcome of this can help to inform coaching staff what particular sports need psychological interventions regarding aggression, to improve performance.

Rethinking Methodology

In a study by Bredemeier & Shields (1986) investigating sport aggression, the participants were interviewed immediately following an important competitive game. The timing of a study can be critical. Therefore, it would be suggested that if the study is repeated, this method be adopted. It means the participants do not have time to forget events, or apply any moral judgement to their actions before reporting.

Maxwell & Moores (2007) indicated that the study of aggression within sport relies on questionnaires, interviews, and observations. Perhaps a combination of all three would greatly help to get a better insight into aggression in sport, and help to move away from single self-reported outcomes. The researcher would benefit greatly from observing the aggression to determine the nature of it, and be able to make an informed decision on whether the act of aggression was sanctioned or unsanctioned (Kerr, 2006). Using this researcher knowledge would help to interpret the results of any interview or questionnaire as a witness, not relying solely on the subjective interpretation of the player.

Due to the critiques and limitations previously mentioned about the CAAS, it would be more beneficial to repeat the study with another scale measuring aggression. The CAAS measurement of aggression is limited. Moving away from the "one size fits all" style questionnaire will help to tailor questions to specific sports, helping to explore links more in depth between sport aggression and its motivation.

Future Research

It is believed that due to the findings, implications and limitations of this research previously mentioned, future research into the area of personality and behaviour in sport would be very beneficial. Using a combination of self-reported questionnaires, interviews and observations would better inform the researcher of true behaviour in sport, not a one-sided point of view Bredemeier & Sheilds (1986). It would be suggested that further research into causes of aggression, investigating possible motives not related to personality, would help to reduce it among participants of competitive sport. It would also be strongly suggested to investigate further the relationship mental toughness has with other personality traits, which emerged throughout this research, and how mental toughness coaching can alter an individual's personality for the better. In summary, refining the research for future use, and creating specific rather than broad measures, would better show a view of sporting behaviour. This would be interesting to investigate further.

Conclusion

This research set out with the aim of investigating predictors of aggression in terms of personality traits. Although some important findings were made regarding the link between fear of failure, mental toughness and aggression, what was predicted prior to analysis of data was not supported by the results. Following the analysis of data, it steered the aims of the study in a new direction, away from predictions of aggression but instead how personality traits can effect one another. Although the aims changed, the objectives of the study remained the same, just from a different point of view. This study has still helped to gain insight into behaviour in people who compete in competitive sport through personality.

Although a direct link was not found between mental toughness, and aggression, what it does suggest is a link between the anxiety of failure, the relationship it has with mental toughness, and how that effects personality. In turn how personality effects behaviour in sport. As it was not the primary intention of this study to investigate mental toughness, it has become very useful in making some predictions, and guide ideas for future research. The justification for this research has remained the same throughout, to better inform mental health coaching in sport, to reduce any issues they face, whether it be aggression, anxiety and fear of failure, or mental toughness levels. It has provided a solid base for future, in depth research, and ideas for psychological sports coaching.

References

Barlett, C. & Anderson, C.A. (2012). 'Direct and indirect relations between The Big 5 personality traits and aggressive violent behaviour'. *Personality and Individual Differences*, 52 (8), pp. 870-875.

Berkowitz, L (2007), 'Frustration–aggression hypothesis', in Baumeister, RF & Vohs, KD (eds), *Encyclopedia of social psychology*, SAGE Publications, Inc., Thousand Oaks, CA, pp. 365-367

Biddle, J.H. & Mutrie, N. (2008) *Psychology of Physical Activity: Determinants, well being and interventions*. 2nd ed, London: Routledge.

Bredemeier, B. J. & Shields, D. L. (1986) 'Athletic Aggression: An issue of contextual morality'. *Sociology of Sport Journal*, 3(1), 15-28.

Clough, P. & Strycharczyk, D. (2012) *Developing Mental Toughness: improving performance, wellbeing and positive behaviour in others*. London: Kogan Page.

Clough, P., & Strycharczyk, D. (2012). *Applied mental toughness: A tool kit for the 21st century*. London, UK. Kogan Page

Conroy, D. E. (2001). Fear of failure as an exemplar for social development research in sport. *Quest*, 53, 165-183.

Conroy, D. E. (2002) *The Performance Failure Appraisal Inventory: PFAI User Manual*. 2nd ED. College of Health & Human Development: The Pennsylvania State University.

[Accessed online: 19th November 2016]

http://www.personal.psu.edu/dec9/uploads/3/0/4/0/304067/2003_pfai_users_manual.pdf

Delaney, P. F., Goldman, J. A., King, J. S. & Nelson-Gray, R. O. (2014) 'Mental toughness, reinforcement sensitivity theory, and five-factor model: Personality and directed forgetting'. *Personality and Individual Differences*, 83, 180-184.

Dixon, L. J., Tull, M. T., Lee, A. A., Kimbrel, N. A. & Gratz, K. L. (2016) 'The Role of Emotion-Driven Impulse Control Difficulties in the Relation Between Social Anxiety and Aggression.' *Journal of Clinical Psychology*, 1-11.

Dollard, J., Doob, L., Miller, N., Mowrer, O., & Sears, R. (1939). *Frustration and aggression*. New Haven, CT: Yale University Press.

Ferguson, C. J. (2007). 'Evidence for publication bias in video game violence effects literature: A meta-analytic review'. *Aggression and Violent Behavior, 12*, 470–482.

Ferguson, C. J., & Dyck, D. (2012). 'Paradigm change in aggression research: The time has come to retire the General Aggression Model'. *Aggression and Violent Behavior, 17*, 220–228.

Green, S. B. (1991) 'How many subjects does it take to do a regression analysis?' *Multivariate Behavioural Research, 26*, pp. 499-510.

Gucciardi, D.F. & Gordon, S. (2012). *Mental Toughness in Sport*. London: Routledge.

Jarvis, M. (2006) *Sport Psychology: A students handbook*. Routledge [Accessed online:27th March 2017]

John, O. P., & Srivastava, S. (1999). 'The Big-Five trait taxonomy: History, measurement, and theoretical perspectives'. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research, 2*, pp. 102–138.

Kerr, J. H. (2006) 'Examining the Bertuzzi-Morore NHL ice hockey incident: Crossing the line between sanctioned and unsanctioned violence in sport.' *Aggression and Violent Behaviour, 11*, 313-322

Kerr, J. H. (2008) 'A critique of the development of the Competitive Aggressiveness and Anger Scale'. *Psychology of Sport and Exercise, 9*(6), 721-728.

Loehr, J. (1982). *Mental toughness training for sports*. New York: The Stephen Greene Press.

Lucas, R (2007), 'Extraversion', in Baumeister, RF & Vohs, KD (eds), *Encyclopedia of social psychology*, SAGE Publications, Inc., Thousand Oaks, CA, pp. 335

Maxwell, J.P. and Moores, E.J. (2007). 'The development of a short scale measuring aggressiveness and anger in competitive athletes'. *Psychology of Sport and Exercise*, 8 (2), pp. 179-193

Morlan, G.K. (1949) 'A note on the frustration-aggression theories of Dollard and his associates'. *Psychological Review*, 56 (1), pp.1-8.

Nicolls, A. R., Polman, R. C. J., Levy, A. R. & Backhouse, S. H. (2007) 'Mental toughness, optimism, pessimism, and coping among athletes.' *Personality and Individual Differences*, 44 (5), 1182-1192.

Rhodes, R. E., & Smith, N. E. I. (2006). 'Personality correlates of physical activity: A review and meta-analysis'. *British Journal of Sports Medicine*, 40, 958–965.

Safraoui, S.R.,(2014). 'Physical, Emotional, and Competitive Aggression Tendencies in Contact and Non-Contact Collegiate Athletes' . *Online Theses and Dissertations*. Paper 220.

Sanz, J., García-Vera, M. P. & Magán, I. (2010). 'Anger and hostility from the perspective of the Big Five personality model'. *Scandinavian Journal of Psychology*, 51, 262–270.

Scott, B. G. & Weens, C. F (2014) 'Resting vagal tone and vagal response to stress: Associations with anxiety, aggression and perceived anxiety control among youths.' *Society for psychophysiological research*, 51 (8), 718-727.

Spicer, J. (2005). *Making sense multivariate data* : SAGE Publications Ltd [Accessed Online: 25th November 2016]

<http://methods.sagepub.com.ezproxy.mmu.ac.uk/book/making-sense-of-multivariate-data-analysis>

Strycharczyk, D. & Clough, P. (2014) *Developing Mental Toughness in Young People*. Karnac Books: London