Exploring the relationship between resilience, perceived stress and academic achievement

Olivia Solomon

Supervised by: Kevin Rowley             March 2013
Exploring the relationship between resilience, perceived stress and academic achievement

ABSTRACT
Understanding the factors that relate to academic achievement is important for improving the performance of university students. Research suggests that an individual’s resilience and their perception of stress have a relationship with academic achievement and that these two variables have a relationship with each other. The current research project explores the nature of these relationships. Previous research has not explored the relationship these two variables have with academic achievement, when used in combination; this relationship will be explored.

A sample of 162 Manchester Metropolitan University Psychology students, in years one, two and three of study, completed an internet based questionnaire, which measured the participants’ resilience, perceived stress and academic achievement. The use of Pearson’s correlation found a negative correlation between perceived stress and academic achievement and perceived stress and resilience. A positive correlation was found between resilience and academic achievement. The use of multiple regression found that these two variables, considered together, predicted academic achievement more accurately rather than individually. This suggests low stress perception and high resilience can lead to high academic achievement.

This study illustrates the importance of resilience and perceptions of stress in relation to academic achievement. Encouraging these two variables in education could improve academic performance.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page Number(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>2</td>
</tr>
<tr>
<td>Introduction</td>
<td>4-7</td>
</tr>
<tr>
<td>Method</td>
<td>7-10</td>
</tr>
<tr>
<td>Results</td>
<td>10-19</td>
</tr>
<tr>
<td>Discussion</td>
<td>19-22</td>
</tr>
<tr>
<td>References</td>
<td>23-28</td>
</tr>
</tbody>
</table>
Introduction

University students can be of great benefit to society by educating future generations with their acquired knowledge (Kumari & Gartia, 2012). Completion of a university course can enable students to enter into important professions, therefore academic success may also be financially rewarding for the individual (Gabre, 2012). Numerous university students continuously achieve low academic grades, while many ‘manage to turn around their academic fortunes’ (Martin & Marsh, 2006, p.267). It is therefore important to understand why some students do not achieve as highly as others. Many believe that an individual’s IQ will determine their academic performance. However ‘[a]cademic achievement is a very complex variable and many variables influence it’ (Sarwar et al. 2010, p.20). It has been suggested that an individual’s perception of stress and their resilience are two variables that have a relationship with academic achievement.

Perceived stress

The years of attendance at university can be challenging and the university environment may put students in demanding social and academic circumstances. Literature suggests that European university students experience a higher amount of psychological stress in comparison to individuals not attending university (Nerdrum et al. 2007). ‘Academic stress pervades the life of students, and tends to impact adversely their mental and physical health, and their ability to perform’ (Akgun & Ciarrochi, 2003, p287). Literature has highlighted the main stressors of the student life experience; these stressors are issues related to managing time, finances, student teacher interaction, social events, getting used to the university environment, absence of close friends and family, self, family and teacher expectation, amount of academic work, going to lectures, academic performance difficulties and thinking about job prospects after university (Agolla & Ongori, 2009; Ang & Huan, 2006; Johnson, 2009; Misra & Castillo, 2004; Shah et al. 2010; Wilks, 2008).

Stress has been defined as a ‘strain that accompanies a demand perceived to be either challenging (positive) or threatening (negative) and, depending on the appraisal, either adaptive or debilitating’ (Sanders et al. 2002, p.75). It was suggested by Lazarus and Folkman (1984) that, for an individual to find something stressful, their perceptual processes must perceive this situation as stressful. This suggests that despite these stressors that encompass university life, a situation may disturb one student, while another student takes the experience of the exact same situation in their stride (Busari, 2012). This is because, although in a highly stressful situation, they may not perceive the situation as stressful (Fry, 1989).

Previous literature has found a relationship between an individual’s perception of stress and their academic achievements. It was found by Inam et al. (2011) that there is a relationship between severe perceptions of stress and academic performance. Sandler (2001), Talib and Zia-ur-rehman (2012) and Gabre and Kumar (2012) also found that perception of stress scores have a significant negative correlation with academic achievement. However, although studies have found that there is a negative correlation between perceived stress and academic achievement it was found by Sanders et al. (2002) and Womble (2003) that there was no association between perceived stress and academic achievement.
Resilience

Many individuals have an extraordinary coping ability, labelled as resilience. In a general sense psychologists have termed resilience as the ability to keep on trying and ‘bouncing back’, under adverse circumstances (Earvolino-Ramirez, 2007). Masten, Best and Garmezy (1990) defined psychological resilience as a ‘process of, capacity for, or outcome of successful adaptation, despite challenging or threatening circumstances’ (p. 426). From an academic perspective, resilience has been defined as ‘the heightened likelihood of success in school and other life accomplishments despite environmental adversities brought about by early traits, conditions, and experiences’ (Wang et al. 1994, p. 46). It has been suggested that resilient students are the students that ‘sustain high levels of achievement motivation and performance despite the presence of stressful events’ (Alva, 1991, p.19).

The majority of the ideas about psychological resilience were mainly due to the work of Garmezy, Werner and Smith (Johnson & Wiechelt, 2004). Garmezy looked at the way that some children, who were at risk of mental illness, developed positively whereas other individuals, in exactly the same circumstances, did not (Luthar, 2003). Werner and Smith (1971, 1977, 1992, 2001) also found that individuals can all be brought up in aversive environments, however their development will differ.

It has been claimed that protective factors encompass resilience and are thought to ‘buffer’ individuals from adversity (Johnson & Wiechelt, 2004). Protective factors are certain abilities that seem to be necessary in order to fuel the process of resilience (Dyer & McGuinness, 1996). Garmezy (1991) and Werner (1989) along with many others categorised protective factors into three categories, these being inherent attributes, family support and external support systems. Inherent attributes are individual protective factors that the individual personally possesses. Many different individual protective factors have been identified, some being locus of control (Rutter, 1987; Seifer et al.1991; Werner, 1989; Werner, 2000), self-esteem (Buckner et al. 2003;Rutter, 1985; Seifer et al 1991; Werner 1989; Werner 2000), self-efficacy (Rutter, 1985;Seifer et al 1991; Werner, 2000), social competence (Bernard, 1991; Radke-Yarrow brown, 1993; Werner, 1989; Werner, 2000), a good sense of humour (Bernard, 1991;Brooks, 1994;Masten, 1994), trust in others (Garmezy,1991; Masten, 1994), striving for achievement (Smokowski et al.1999;Werner, 2000), activity level (Werner, 1989; Werner 2000), independence (Anthony,1974; Werner 2000), self-regulation (Buckner et al. 2003) and optimism (Smokowski et al.1999;Song, 2003).

Past research suggests that there is a positive correlation between resilience and academic achievement. Dass-Brailsford (2005) conducted a study on black youths in South Africa. These youths were experiencing the adversity of poverty, nevertheless they still achieved high academic results and all the individuals seemed to be resilient, therefore the study suggested that there is a relationship between resilience and academic success. Reyes and Jason (1993) also conducted a study that aimed to comprehend the success of inner city high school students. Those students, who they found were at low risk of dropping out of school, possessed resilience; however those that were at high risk did not possess resilience. Lee (2009) showed that being resilient related to higher grade point average scores and Hanson and Austin (2003) also found that there is a relationship between resilience and academic
achievement. Therefore some research suggests that resilience enables students to achieve high academic marks regardless of any challenges they may face which may make this process of achievement harder (Benard, 1991). On the other hand Sarwar et al. (2010) claim that there is no relationship between resilience and academic achievement, according to marks gained by students at tenth grade. Elizondo-Omaña et al. (2010) also found that resilience does not predict academic performance.

As the relationship between perceived stress and academic achievement and resilience and academic achievement is unclear in relation to previous research, the present study further explored the nature of these relationships.

Hypothesis 1 - there will be a negative correlation between perceived stress and academic achievement.

Hypothesis 2 - there will be a positive correlation between resilience and academic achievement.

The relationship between perceived stress and resilience

It has been found that resilience and perceived stress have a relationship with each other. Wagnild and Young (1993) describe resilience as ‘a personality factor that moderates the negative effects of stress and promotes adaptation.’ (p.178) It was also found by Petrie (2010) that the higher the resilience levels among adolescents with Cystic fibrosis, the lower the perceived stress. Frigborg et al. (2006) found that individuals who were highly resilient reported less stress than those who were not as resilient and Pietrzak et al. (2009) found that soldiers with post traumatic-stress disorder also had low resilience scores. This supports the ideas of Lazarus who suggested that ‘the impact of stressors pivots on (a) the stressor being perceived as threatening or demanding and (b) a lack of appropriate resources to manage the stressor’ (Roberti, Harrington & Storch, 2006, p.135). Therefore there could be a negative correlation between perceived stress and resilience and perhaps both resilience and perceived stress influence each other in some way. The present study will explore this relationship.

Hypothesis 3 - There will be a negative correlation between perceived stress and resilience

The present study

Previous literature has only explored the relationships that these two variables have with academic achievement, in isolation. Therefore as it is suggested in previous literature and hypothesised that perceived stress and resilience both have a relationship with each other and with academic achievement, the present study aimed to see how these relationships work when used in combination.

Hypothesis 4 - resilience and perceived stress would be better predictors of academic achievement in combination rather than individually.

The present study, therefore, looks at the relationship between perceived stress, resilience and academic achievement amongst students who attend Manchester Metropolitan University (MMU) and who study Psychology in years one, two and three. For the purpose of this study, it is assumed that these students might all be
experiencing the same basic levels of stress that come with university life in their particular year of study. The results of the current study will enable a clearer understanding of the relationship between perceived stress and academic performance, resilience and academic performance and resilience and perceived stress. If it is found that these two variables both have a relationship together and alone with academic performance, these two variables will be used in combination to understand their relationship with academic achievement. The present study will also explore the extent to which age is related to perceived stress and resilience and look at the two variables across the different years of university study. This study may improve the understanding of the relationship that these variables have with each other and with academic achievement. If these variables are found to be important, in relation to academic achievement, then these variables could be encouraged within an educational setting.

Method

Design

A correlational design was used, which collected data from participants using self-report questionnaires. The measures within this questionnaire explored the relationship between perceived stress, resilience and academic achievement.

Participants

162 MMU psychology students participated in the study. The study used 51 participants from year one of study (32 %), 54 from year two of study (33%) and 57 from year three of study (35 %). This large number of participants allowed for a variety of responses, leading to increased confidence of a representative sample. Participants ages ranged from 18 to 62 years (M = 21.28, SD = 5.56). The final sample consisted of 78% females and 22% males. Participants were recruited by opportunity sampling via a link that the researcher posted on to a social networking website called Facebook. The link was sent to participants’ inbox and posted on MMU psychology Facebook groups. If individuals accepted they could complete the questionnaire via the link provided, which directed the participant to a website called Survey Monkey.

Materials

The questionnaire was input on to a survey hosting website called Survey Monkey. A monthly membership of this website was purchased for 24 pounds per month. Once all responses were collected, Survey Monkey directly inputs the participants’ responses to Excel, which enabled the simple input of responses into SPSS.

Measures

The utilisation of a questionnaire format enabled the distribution of questionnaires to a large number of people. This was time efficient, cost effective and convenient. The questionnaire format also ensures anonymity; making the participants more likely to be at ease when discussing personal information (Breakwell et al. 2000; Leedy & Ormrod, 2005).
The front page of the questionnaire briefed the participant on the study and asked their age, gender and year of study (Appendix 1). Allowing for statistical analysis, females were coded as the number one, and males were coded as the number two.

The second page of the questionnaire used the ten item perceived stress scale (PSS-10), (Cohen et al. 1983) (Appendix 2). The study assumed that the students in the sample were going to have experienced roughly equal levels of stress as they were all at the same university. Therefore the PSS-10 was used to highlight the participants’ personal perception of stress and how perceptions of stress may differ in each individual. The PSS-10 measures individual’s perception of stress in the past month. Therefore, the researcher assumed that perceptions of stress within the past month will be similar to the individual’s general perception of stress, this deeming the PSS-10 useful for the purpose of the present study. Lee (2012) analysed 12 studies that had used the PSS-10 and evaluated the Cronbach’s alpha at >.70. This suggests that the PSS-10 has good reliability. Cohen and Williamson (1988) also found the PSS-10 to have good construct validity stating that ‘PSS scores were moderately related to responses on other measures of appraised stress, as well as to measures of potential sources of stress as assessed by event frequency’ (Cohen & Williamson, 1988 p.55). It has also been found that the predicative validity of the PSS-10 is good (Allen, 2012).

The PSS-10 requires participants to rate themselves on a scale from 0 to 4 in response to questions measuring their perception of stress.

0 - never;
1 - almost never;
2 - sometimes;
3 - fairly often and
4 - very often.

Higher scores on the PSS-10 show a higher perception of stress. Scores on the PSS-10 were found by ‘reversing responses to the four positively stated items (items, 4,5,7 & 8) and then summing across all scale items’ (Cohen 1994, p.1).

The next page of the questionnaire asked questions about the individual’s academic achievements (Appendix 3). Three questions were composed by the researcher asking the participants’ most recent multiple choice test (MCT) mark and their most recent piece of coursework mark; the individual then wrote their response in the space provided. The participant was also asked what mark they most commonly achieve and was asked to tick either between 40 and 50 (responses coded as the number one), between 50 and 60 (responses coded as the number two), between 60 and 70 (responses coded as the number three) and 70 and above (responses coded as the number four). Academic achievement was scored by looking at the participant’s response.

The remaining eleven questions, within the questionnaire, took an original approach and were constructed to test the participants’ resilience (Appendix 4). These questions were derived from specific individual protective factors, which were discovered by undertaking thorough literature research. This research suggested
that resilient people possess certain protective factors that can make an individual resilient. Many protective factors of resilience were found within the literature. However, when the strength of the evidence base, relating to each protective factor was evaluated, only the protective factors that had the strongest evidence base were chosen to be used. These were optimism, locus of control, self-esteem, self-efficacy, social competence, humour, self-regulation, independence, activity level, trust and achievement striving. Evidence of how each individual protective factor relates to previous literature and therefore why it is included within the questionnaire is given in appendix 7.

Eleven scales from the international personality item pool (IPIP) that related to these eleven individual protective factors of resilience were then used as the basis for the study. This was done by accessing the website (http://ipip.ori.org/) where the IPIP items that matched the chosen individual protective factors were selected. IPIP was used because it provides measures that are free to use and are an abridged version of a ‘pre-existing validated questionnaire’, which increases ease and reliability. Each IPIP scale that was used consisted of typically five to ten statements, both positive and negative statements.

In order to construct the final resilience measure from these IPIP items an original approach was used. The positive and negative statements in each IPIP item were summarised into a short description that attempted to capture the overall meanings across the items in a few sentences. If not summarised the chosen resilience facets from IPIP may make the questionnaire lengthy and time consuming. Therefore due to time and practicality (Woods & Hampson, 2005) the negative statements in each scale were summarised to make one single item, which related to not possessing that particular facet of resilience and the positive statements in each scale were summarised to make one single item, which related to possession of that resilience facet.

For example

<table>
<thead>
<tr>
<th>IPIP item – Optimism (.71)</th>
<th>IPIP item optimism summarised in to short description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ keyed</td>
<td>Never give up hope.</td>
</tr>
<tr>
<td></td>
<td>Love life.</td>
</tr>
<tr>
<td></td>
<td>Work on improving myself.</td>
</tr>
<tr>
<td></td>
<td>Keep improving myself.</td>
</tr>
<tr>
<td></td>
<td>Know what I want.</td>
</tr>
<tr>
<td>– keyed</td>
<td>I feel that my life lacks direction.</td>
</tr>
<tr>
<td></td>
<td>I am not sure where my life is going.</td>
</tr>
<tr>
<td></td>
<td>I am resigned to my fate.</td>
</tr>
<tr>
<td></td>
<td>Let others determine my choices.</td>
</tr>
<tr>
<td></td>
<td>Agree to anything.</td>
</tr>
<tr>
<td></td>
<td>I always try to improve myself and I know just what I want. I love life and try to never give up hope.</td>
</tr>
<tr>
<td></td>
<td>I often feel like my life is lacking direction and I am not sure where it is going. I feel as if I am resigned to my fate, letting others determine my choices and agreeing to anything that those around me say.</td>
</tr>
</tbody>
</table>
This was repeated for all of the eleven individual protective factors.

‘Pairs of contrasting descriptions presented one at each pole of a rating scale allow participants to make a bi-directional judgement about bipolar constructs. Moreover, these descriptions are directionally consistent with respect to the factor being measured, in contrast to a unipolar format. Additionally, using such an approach reduces the number of single items required’ (Woods & Hampson, 2005, p.376). Therefore the two poles for each created resiliency facet were placed at opposite ends of a rating scale consisting of numbers from one to nine.

This original approach was based on previous research, which suggested that this was a useful, reliable and valid approach to use. Woods and Hampson (2005) found that this approach ‘demonstrated good convergent and divergent correlations, test–retest reliability was acceptable, and criterion correlations were also comparable’ (p.386). Woods and Hampson (2005) also showed support for ‘the use of bipolar scales for this brief measure’ (p.386).

Resilience scores were then calculated from the individual’s numerical selections on the additional scale below the question, which was created solely for the individual’s response. There were originally two variations of each resilience measure created (Appendix 6). However, only one question from each resilience measure was used in the final questionnaire. This was to ensure that the optimum resilience measure, out of the two, was chosen to be used within the questionnaire and so that the questionnaire was not too long.

Procedure

The measures used within the questionnaire were input onto separate pages on Survey Monkey, which when combined, made the final questionnaire. Links for the questionnaire were sent through Facebook, via participants’ private mailboxes or on groups that are specifically related to studying psychology at MMU.

Ethical considerations

The present study follows ethical guidelines and there is nothing particularly controversial about this research project or the questions asked within the questionnaire. All participants were reminded, in the briefing on the front page of the questionnaire, that they may withdraw from the investigation before completing the questionnaire. However, they were also told that if the questionnaire was completed, this was taken as the participant’s consent to take part in the study and that by giving their consent to take part in the research project they will no longer be able to withdraw. This was due to the way in which Participants were not asked their names in order to keep all participants anonymous, this meaning withdrawal, once the questionnaire had been returned to the researcher, was difficult.

Results

Once all data had been gathered, through the Survey Monkey website, it was downloaded and input into SPSS 19.0. Some items were reversed and some coded (see method) in order to make the data easier to analyse. The total scores for the
resilience variable and perceived stress variable were computed for each participant. Data from 162 MMU psychology students was available for analysis.

A histogram was plotted of both the resilience and perceived stress measures, in order to ensure that these measures were both roughly normally distributed, without any major skew. The histograms showed that these measures were both roughly normally distributed. Histogram plots for these variables are shown below.

Figure 1 - histogram for resilience measure

Figure 2 - histogram for perceived stress measure
The internal consistency of both the resilience variable and the perceived stress variable was found before analysing the data.

The Cronbach’s alpha and the 95% confidence interval for alpha are displayed in Table 1.

**Table 1**

Cronbach’s Alpha (internal consistency) for Variables Related to perceived stress and resilience (N = 162)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number of items in variable score</th>
<th>Cronbach’s alpha</th>
<th>95% Confidence Interval for alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
</tr>
<tr>
<td>Resilience</td>
<td>11</td>
<td>.80***</td>
<td>.75</td>
</tr>
<tr>
<td>Perceived Stress</td>
<td>10</td>
<td>.88***</td>
<td>.86</td>
</tr>
</tbody>
</table>

Note: *F* test with true value = 0.7, ***p < .001

Table 1 shows that the Cronbach’s alpha value for the resilience and perceived stress measures were adequately reliable, both having a Cronbach’s alpha value significantly above .7.

The mean and standard deviations for each of the measures were found when it had been established that the variables were internally reliable. This is shown in table 2. Table 2 also includes the means and standard deviations for the self-reported last coursework and last multiple choice test mark.

**Table 2**

Descriptive Statistics for Variables Related to resilience, perceived stress and academic achievement

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSS</td>
<td>154</td>
<td>16.72</td>
<td>6.46</td>
</tr>
<tr>
<td>Resilience</td>
<td>155</td>
<td>59.78</td>
<td>10.49</td>
</tr>
<tr>
<td>Last coursework mark</td>
<td>156</td>
<td>62.79</td>
<td>8.19</td>
</tr>
<tr>
<td>Last MCT mark</td>
<td>158</td>
<td>73.86</td>
<td>14.53</td>
</tr>
</tbody>
</table>
Note: number of respondents within each variable changed because not all respondents completed all items within each scale.

The scores for the ‘mark usually achieved’ variable were not a percentage but were classified as mark bands coded as numbers 1, 2, 3, and 4 (reflecting increasing mark band) the frequency was found for this measure instead of the mean and SD. This is shown in table 3.

**Table 3**

**Descriptive statistics for mark usually achieved in work (N=162)**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 40 and 50</td>
<td>12</td>
</tr>
<tr>
<td>Between 50 and 60</td>
<td>39</td>
</tr>
<tr>
<td>Between 60 and 70</td>
<td>102</td>
</tr>
<tr>
<td>70 and above</td>
<td>9</td>
</tr>
</tbody>
</table>

Pearson’s correlation was performed on the variables to establish the relationship between them; this is outlined in Table 4.
Table 4

*Pearson Correlation Matrix among Variables Related to perceived stress, resilience and academic achievement (N = 162)*

<table>
<thead>
<tr>
<th>What mark did you get for the last piece of course work you did?</th>
<th>What mark did you get for your last multiple choice test?</th>
<th>What mark do you usually achieve in your work?</th>
<th>Total perceived stress</th>
<th>Total resilience</th>
</tr>
</thead>
<tbody>
<tr>
<td>.38***</td>
<td>.52***</td>
<td>-.09</td>
<td>.27***</td>
<td></td>
</tr>
<tr>
<td>.38***</td>
<td>- .08</td>
<td>.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-.35***</td>
<td>.39***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.43***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: ***p < .001, one-tailed.
Table 4 shows that perceived stress is negatively and significantly correlated with resilience, thus meaning that as reliance scores go up, perceived stress scores go down.

Table 4 also shows that the three measures that assess academic achievement are all significantly positively related. However these relationships are not very strong, the strength of these relationships can be indexed by simply squaring the correlation. A correlation of 0.38 can be seen between the participants’ most recent MCT (Multiple Choice Test) mark and their most recent coursework mark. This value can be considered as being between a medium and large effect size (Cohen, 1992, 1988). When this correlation is squared it can be seen that these two variables only have 14% in common. A similarly weak relationship is shown by the correlation between the participant’s last MCT mark and the mark they usually achieve; these variables again only have 14% in common. The strongest relationship was between the participant’s mark for the last piece of coursework and the mark they usually achieve, which can be seen to have a correlation of 0.52. This value can be considered as being a large effect size (Cohen, 1992, 1988) and these two variables have 27% in common. Therefore although all three types of academic measure are all positively related, each measure is different.

As each academic measure is different, in order to understand whether perceived stress and resilience together could better predict academic achievement, rather than individually, it would be useful to carry out three separate multiple regressions for each different measure of assessment, in relation to resilience and perceived stress. However table 4 also shows that the participants’ MCT marks have almost no correlation with either perceived stress scores or resilience. The participant’s last coursework mark does not significantly correlate with perceived stress scores but does significantly correlate with resilience. Therefore multiple regression was not carried out on either the multiple choice test scores or the participant’s last coursework mark. However the mark the participants’ usually achieve correlates with both perceived stress scores and resilience, being positively related to resilience and negatively related to perceived stress scores.

Therefore in order to see whether resilience and perceived stress were better predictors of academic achievement together, rather than individually, multiple regression was only used on the mark the participants usually achieve. This is shown in table 7.

When carrying out multiple regression the N is lower (N =147) because some participants did not fill in every answer on the questionnaire. Therefore table 5 and 6 have been presented as when using multiple regression on marks usually achieved, there is a smaller number of people involved and therefore the means, standard deviations and correlations are slightly different from the earlier examples in table 2 and 3.
Table 5

Descriptive Statistics for resilience and perceived stress variables (N = 147)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSS</td>
<td>16.87</td>
<td>6.52</td>
</tr>
<tr>
<td>Resilience</td>
<td>59.86</td>
<td>10.41</td>
</tr>
</tbody>
</table>

Table 6

Pearson Correlation Matrix among variables related to perceived stress, resilience and academic achievement (N = 147)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What mark do you</td>
<td></td>
</tr>
<tr>
<td>usually achieve in</td>
<td></td>
</tr>
<tr>
<td>your work?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PSS</td>
<td>-.37***</td>
</tr>
<tr>
<td>Total Res</td>
<td>.39***</td>
</tr>
</tbody>
</table>

Note: ***p < .001, one-tailed.

The values in table 6 can be considered to be between a medium and large effect size. (Cohen, 1992, 1988)

Table 7

Summary of Regression Analysis for Variables Predicting marks usually achieved (N = 147)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>β</th>
<th>T</th>
<th>Sig.(p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant (intercept)</td>
<td>2.019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total PSS</td>
<td>-.027</td>
<td>-.251</td>
<td>-3.048</td>
<td>.003</td>
</tr>
<tr>
<td>Total Resilience</td>
<td>.019</td>
<td>.281</td>
<td>3.410</td>
<td>.001</td>
</tr>
</tbody>
</table>
Note: $R^2 = .203$

The regression model for the prediction of the mark the participant usually achieved is shown in Table 7. Perceived stress scores and resilience were significant predictors of mark usually achieved. This regression model was statistically significant $F(2,144) = 18.29, p < .001$.

It can be seen from Table 4 that both resilience and perceived stress scores are related to mark usually achieved; resilience positively and perceived stress negatively. It can be seen that on their own, each variable correlates at -0.37/0.39 with the mark the participant usually achieves. The reason there is a negative correlation here is because, as perceived stress scores go down, the mark the individuals usually achieve go up and as resilience scores go up, mark usually achieved goes up.

Table 7 shows that the multiple correlation coefficient is higher than either of the correlations on their own and the multiple correlation coefficient $R = .45$. Both resilience and perceived stress are significant predictors of mark usually achieved when used in combination and that is why a better multiple correlation coefficient is found when both measures are used together, rather than when they are used individually.

$R^2 = .203$, this means that 20 per cent of the variance in mark usually achieved is accounted for by the two variables of perceived stress and resilience in combination. Therefore if resilience and perceived stress in combination can explain 20 per cent of the variance in mark usually achieved then this is clearly more than the variance explained when either of the variables of resilience and perceived stress are used on their own as when squared individually this percentage of the variance in marks usually achieved is considerably lower. Therefore student self-reports of perceived stress and the student self-reports of resilience, used in combination, are strong predictors of how the participants report their usual mark.

The percentage of participants used from each year group is similar (32 % from year one, 33 % from year two and 35 % from year three). Due to this, the data was analysed in order to understand whether there was a difference between resilience and perceived stress scores across the three years.
Figure 3

Note: number of respondents within perceived stress variable changed because not all respondents completed all items within each scale.

Figure 3 shows little difference in perceived stress scores across the three years of study and there was no significant difference using an independent measures one way Anova $F(2,151)=.538, p=.59$.

Figure 4

Note: number of respondents within perceived stress variable changed because not all respondents completed all items within each scale.

Figure 4 shows little difference in resilience scores across the three years of study and there was no significant difference using repeated measures using a one way Anova $F(2,152)=.569, p=.57$. 
Pearson’s correlation was performed in order to establish the relationship between age and the two variables of perceived stress and resilience. This is shown in table 8.

**Table 8**

*Pearson Correlation Matrix among Variables Related to age, perceived stress and resilience (N = 162)*

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived stress</td>
<td>-.19*</td>
</tr>
<tr>
<td>Resilience</td>
<td>.19*</td>
</tr>
</tbody>
</table>

Note: *p < 0.05, two-tailed.

Table 8 shows that age and perceived stress are negatively significantly correlated and that age and resilience are positively significantly correlated. Therefore the older the participants are, the lower their perception of stress and the older the participants are the more resilient they are. These values can be considered to be between a small and medium effect size (Cohen, 1992, 1988).

**Discussion**

The present study explored the relationship between perceived stress, resilience and academic achievement among MMU students who are studying psychology. Previous literature research encouraged the present study to clarify the relationship between perceived stress and academic achievement, hypothesising that a negative correlation would be found (hypothesis 1). Resilience and academic achievement, hypothesising that a positive correlation would be found (hypothesis 2) and perceived stress and resilience, hypothesising that a negative correlation would be found (hypothesis 3). The present study also aimed to determine whether perceived stress and resilience were better predictors of academic achievement in combination, rather than individually (hypothesis 4). Hypothesis four had not been explored in previous literature and therefore the researcher felt it appropriate to investigate this relationship. The present study also explored whether perceived stress and resilience had a relationship with age and looked at resilience and perceived stress across the different years of study at MMU.

The results from the present study supported hypothesis one and found a negative correlation between perceived stress and academic achievement. This supported previous findings from (Gabre & Kumar, 2012; Inam et al. 2011, Sandler, 2001 & Talib & Zia-ur-rehman, 2012) who also found a negative correlation between perceived stress and academic achievement. Therefore findings from the present study suggest that the higher the students’ perception of stress the lower their academic marks and vice versa. This contradicts findings by Sanders et al. (2002), who suggested that there is no relationship.
The current study also supported hypothesis two and the findings from previous literature, finding a positive correlation between resilience and academic achievement (Dass-Brailsford, 2005; Hanson and Austin, 2003; Lee, 2009; Reyes and Jason 1993). This suggests that when MMU Psychology students are highly resilient they will also achieve high academic grades, however those who are not very resilient will achieve lower academic grades. Therefore findings from this study contradict findings from Sarwar et al. (2010) and Elizondo-Omaña et al. (2010) who both suggested that there was no relationship between resilience and academic achievement.

On the other hand Although the relationship between the two variables and academic achievement was supported, it was only supported by the specific measurement of academic achievement used within this study, this being how well the students usually perform. These relationships were only partially supported by the participants most recent coursework mark and not at all by their most recent MCT. Therefore findings from the present study only moderately support these relationships. However, one reason for this could be due to the way in which the participants most recent MCT marks and most recent coursework marks represented only one particular mark, achieved on one individual occasion. Therefore the marks the participants achieved for earlier MCTs and pieces of coursework could have related more to the mark that they usually achieve.

Another possible interpretation for this could be that the participants MCT and coursework marks were the true representation of the participants’ achievement. The participants’ recall of the mark that they usually achieve may have been unreliable because the particular measure is self-reported. If the individual is not particularly resilient, then they may report the mark they usually achieve as much lower than what they usually achieve, or if they are resilient they might report their mark as much higher than a realistic mark that they usually achieve. This could be due to some of the individual protective factors that encompass resilience, such as optimism and self-esteem. Therefore, perhaps these individual protective factors are influencing their self-reported response on this measure of assessment. This would support the findings of Sarwar et al. (2010), Elizondo-Omaña et al. (2010) and Sanders et al. (2002) who suggest that there is no relationship between these two variables and academic achievement. However, this seems unlikely and it seems more appropriate to suggest that the most recent multiple choice test marks and the most recent coursework marks are not true representations of the participants’ academic achievements, however the academic measure of marks usually achieved is.

The present study also supported hypothesis three, finding that resilience and perceived stress have a negative correlation with each other, as suggested by Petrie (2010) and Frigborg et al. (2006). Therefore when the student was highly resilient, their perception of stress was low, and when their perception of stress was high, their resilience was low. This suggests that perhaps perceived stress and resilience have an influence on each other in some way. Perhaps resilience mediates perceived stress, so that when MMU students are all faced with the same basic level of stress, their individual protective factors that are suggested to determine their resilience level, which in turn determines whether the individual either perceives the situation as stressful or not. This would support the ideas of Wagnild and Young (1993) who describe resilience as ‘a personality factor that moderates the negative
effects of stress and promotes adaptation’ (p.178). On the other hand perhaps the individual’s perception of stress mediates their resilience, if the individual does not perceive situations as very stressful, this could enable them to be resilient. There is no clear explanation for this relationship between perceived stress and resilience; however the results from the present study suggest that they do influence each other in some way. This supports the ideas of Lazarus who suggested that the effect stressors have on an individual is dependent on both the way in which the individual perceives the stressor and the resources they have to cope with the stressor (Roberti, Harrington & Storch, 2006, p.135).

Previous studies have only looked at the individual relationships that perceived stress and resilience have with academic achievement. However as the present study and previous literature found that resilience and perceived stress both have an individual relationship with academic achievement and with each other, the researcher wanted to understand the relationship that resilience and perceived stress have with academic achievement, when in combination. Due to this the present study explored hypothesis four, this being whether resilience scores and perceived stress scores could more reliably predict academic achievement together than they could individually. Hypothesis four was supported as the present study found that student self-reports of perceived stress and the students’ self-reports of resilience, when put together, are stronger predictors of how the participants report academic achievement rather than when used in isolation. This clearly suggests further support for the relationship between resilience, perceived stress and academic achievement but also suggests that resilience and perception of stress, although having a correlation, are separate variables. This is clear as if they were not, they would not be able to add to the prediction of academic performance when used in combination. Therefore even resilient students can have perceptions of stress and students with high perceptions of stress can be resilient, but findings from the present study suggest that the more resilient a student is and the less perceived stress a student has, the higher their academic achievement.

The present study also found that there is a relationship between age and the students’ resilience and perceived stress. The results from the current study suggested that as the age of the students increased, the more resilient they were and the lower their perception of stress. Resilience and perception of stress was also looked at across the three years of study at MMU. It was found that there was no relationship between the year of study and the students perception of stress or resilience.

Limitations

The first limitation of the present study is the way in which self-report measures were used. Although beneficial in some ways, the use of self-report measures made it possible for students to answer the questions dishonestly or unreliably, possibly reporting their resilience, perceived stress and academic achievements unrealistically. This could be due to social desirability bias (Grimm, 2010; King & Bruner, 1999) or even biased opinion of the self, due to their resilience level. It would therefore be beneficial for a longitudinal study to be conducted, perhaps involving interviews, in order to assess resilience and perception of stress. It would also be beneficial for the researcher to personally view the students’ academic achievement marks. It would also be helpful to examine more than three measures of academic
achievement, including measures from the whole year of study and perhaps also previous years of study.

The second limitation of the research is that the study was conducted solely on MMU students who were studying Psychology. Therefore the present study does not describe the extent to which these findings are true of other university students on different courses, universities and differing levels of education (A-levels, GCSE). As the hypotheses were tested on these specific individuals, it is clear that resilience and perceived stress relate to this specific form of academic achievement; however this finding could help all forms of education if it was explored more widely.

The third limitation was the way in which perceived stress was measured using the PSS-10. This scale only measures perception of stress in the past month. It was assumed that the perception of stress in the past month was representative of perception of stress in general. However this may not be the case and therefore it would be useful to measure an individual's perception of stress throughout a longer time period.

**Ideas for future research**

It would be beneficial for future research to explore the relationship between perceived stress and resilience further. Clarification of this relationship would enable a better understanding of how to encourage these variables in an educational setting to enable higher academic achievement. The present study also suggests the usefulness of taking this single item measure approach to a questionnaire. The findings from the present study suggest that if future researchers want fairly short measures of broad constructs that will be reliable and useful for predicting important outcomes such as academic achievement, this would appear to be an appropriate approach. Therefore this questionnaire approach could be a useful approach for other similar studies.
References


International Personality Item Pool: A Scientific Collaboratory for the Development of Advanced Measures of Personality Traits and Other Individual Differences (http://ipip.ori.org/).


