A questionnaire-based study regarding the relationship between educational debt, perceived stress and student engagement

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**ABSTRACT**

On the 12th October 2010 *The Browne Review* proposed tuition fee caps be removed, since then a resulting 64 UK universities intend to charge the full £9000 allowed by government.

Many would agree that debt can have a debilitating effect on one’s life so now 2012 students face up to £53000 of debt (Push Survey, 2011) one must ask what effect this burden could have on today’s undergraduates?

The aim of this research was to ascertain whether current levels of debt incurred by HE students influence stress and whether as a result, academic engagement is affected.

Stress is defined here as an internal reaction to an environmental stressor (debt) which influences the level of engagement students have with university.

One hundred Manchester Metropolitan University students were surveyed using three established psychological scales; the primary predictions were that a positive relationship between debt and stress and a negative relationship between stress and engagement would be observed. Part-time work and *socioeconomic status* were also considered.

Findings partially supported the notion that debt, stress and engagement are connected however, stronger relationships with other variables were also observed, and the implications of this for future research are considered.

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**KEY WORDS:** STRESS DEBT STUDENT ENGAGEMENT SOCIO-ECONOMIC STATUS HIGHER EDUCATION
Introduction

Stress as a research area has a long varied history who many suggest started with
the work of biologist Hans Selye (1976) and his studies of the universal physiological
reaction humans have when placed in demanding situations. His conceptualisation
that external stimuli cause an internal reactions resulting in physiological responses
is an example of strain research. However, some authors emphasize ‘stress’ isn’t
defined in Selye’s work the way it is conceptualised today (Smyth, 2004) which is
attributed to translation errors. This blurring of the stress definition led to varying
interpretations and a miscellany of research encompassing various concepts and
methodologies, which require discussion before a context-appropriate
conceptualisation can be established.

Defining stress is problematic as there are inconsistent definitions between
academic journals with some not defining it at all (Jex et al,1992). Furthermore, the
notion of ‘stress’ is frequently confounded with two similar but distinct concepts of
‘stressors’ and ‘strains’. Strains are responses, such as the physiological ones Selye
studied, psychological changes (Brown& Harris, 1978) and health behaviours
(Dunn et al, 1999). Stressors conversely, are external events that place demands
on an organism producing a nonspecific response. Examples of stressor research
would be Holmes and Rahe’s (1967) Life events approach which proposes change is
disruptive and requires adaptation, consequently those who experience frequent or
traumatic events (e.g. bereavement) are at greater risk of developing illness.

One criticism of Life-events is that it depicts individuals as passive yet a broad
history of research advocates we are much more interactive with our environment
and are active agents in our own lives, this forms the basis of an alternative ideology,
The interactional approach (Cohen &Wills, 1985). This approach suggests
susceptibility to stress is based on an interaction between the individual and their
environment in which subjective differences, like social support, arbitrate the effects
experienced. Examples of this research are stress-buffering hypothesis (Cohen
&wills, 1985), Iso-strain model (Johnson & Hall, 1988) and Job-Demand-Control
theory (Karasek &Theorell, 1990). These theories suggest stress occurs when there is a perceived imbalance between demand and response (Mcgrath, 1976). However,
they measure stress independently of appraisal, suggesting the individual and the
environment operate autonomously, a notion heavily criticised by Lazarus et al
(1985). Their transactional approach is a contemporary theory, which shifts
attention onto the psychology of the individual stating other more personal processes
such as perception and evaluation are involved. To Lazarus stress is an ever-
changing process involving the interaction of many continuously shifting variables
thus there is less focus on the structural aspects of stress and increased focus on the stress process (Leka &Houdmont, 2010).

It is crucial now to emphasize the use of the perceived-stress scale in the present
research is to assess whether or not students appraise their situation as stressful,
which Lazarus believes to be crucial for proper measurement as it considers
individual variation. ‘Stress’ here then, is an internal reaction to external stressors
appraised as challenging by the individual, which in turn elicits behavioural changes.
That is, debt intensifies perceived-stress, which influences behaviour relating to
engagement.
This can be conceptualised in terms of Steptoe’s **cognitive-behavioural-pathway** (1991) which states external stressors (debt) lead to affective responses (“stress”) which prompt cognitive reactions (appraisal) which elicit behavioural change (engagement).

CBP views behaviour as a **mediator** between stressors and strains, for example in stress-related illness (e.g. heart disease), stressors do not **cause** illness but rather prompt behaviour associated with ill-health such as drinking. **Moderator**/mediator effects are useful in stress research but are often used incorrectly and interchangeably within the literature (Baron & Kenny, 1986).

Students are a major focus within stress research with numerous studies demonstrating their vulnerability to its negative consequences (Steptoe et al, 1996; Robotham, 2008; Michie et al, 2001; Abouerie, 1994; Royal College of Psychiatrists, 2003/2011). These include poor health behaviours (e.g. smoking) (Carpenter & Hassin, 1999) and psychological consequences such as anxiety and depression (Pace & Trapp, 1995). This highlights the tendency to pathologise stress however there has been much research on the concept of “**eustress**” (Selye, 1978) the “positive psychological response to a stressor” (Simmons, 2000).

Student’s susceptibility has been attributed to varying sources from ‘**imbalance**’ (Doble & Supriya, 2010) to ‘self-imposed’ stressors like high expectations (Hamaideh, 2011) with some scholars proposing that increasing education levels elicit more stress (Hall et al 06; Ross & Morrison, 2004). Many blame financial difficulties (Foster, 1995; Robert et al, 1999; Schafer, 1996) which is a recurrent contributor emphasised within the literature.

Bennet (2003) positioned debt as the strongest influence on the decision of students considering withdrawing and Collier et al (2002) similarly found a significant negative effect of financial difficulties on student’s wellbeing. Others however suggest educational debt is an investment in the future and thus students adjust their attitudes becoming more tolerant viewing debt as a temporary but necessary means to gain higher prospective income (Davies & Lea, 1999). A feasible notion, however Fox (1992) found undergraduate debt significantly deters postgraduate enrollment, which is also presumably an investment in **human capital**.

Furthermore, Davies and Lea’s sample incorporated students from relatively prosperous backgrounds who presumably already have a higher tolerance of debt, as they are sheltered from its negative effects by their family income (Dwyer et al, 2011). Additionally, this study and many others, took place before 2010’s monumental rise in fees, and are incredibly out-dated as the estimated debt of participants is minuscule compared to that faced by today’s graduates (Callender, 2003; Austin & Phillips, 200; Van Dyke & Little, 2002).

Class differences noted above were explored by Dwyer et al (2011) who found debt does not have universally negative effects but contrariwise is associated with higher self-esteem and increased mastery but, as predicted, negative debt-effects were accentuated for low-class students and blunted for middle and upper class students. They hypothesized negative debt-effects are deferred during study as students are not yet making repayments and feel empowered believing debt facilitates upward mobility, however as age increases positive effects correspondingly diminish presumably as debt becomes more burdensome.
This is in contrast to other research suggesting younger people suffer increased anxiety due to debt (Drentea, 2000). Drentea suggests actual debt figures may not contribute to anxiety but rather individual perceptions cause differences in worrying. This distinction is vital in terms of SES as perceived-debt is subject to individual variation and could influence wellbeing regardless of how much or little it is. Thus, actual debt figures are required to separate out these effects and although it is predicted SES will have a negative relationship with objective debt, even in absence of this relationship, SES will still be negatively associated with perceived debt.

Numerous studies have established negative correlations between stress and performance (Bennet, 2003; Struthers et al, 2000; Linn et al, 1984; Clark et al, 1986; Ross et al, 2006; Andrews & Wilding, 2004). However, many used self-report measures, which are likely to be inaccurate (Jones & Bright, 2001) although Bennet (2003) following Tinto (1993), argues perceived and actual attainment correlate highly. Nevertheless, the present focus on final year students warrants a good possibility performance will be under/overestimated. Taylor et al (2005) implicate social desirability and state underestimation is common in low-achievers; underestimation could also result from negative affective states brought on by stress (Cohen et al, 2007). Therefore, as student engagement has been shown to predict performance and because stress has been implicated in academic withdrawal, for this research engagement is a superior indicator of behavioural strain outcomes.

Student engagement is a concept that has become popularized due to its links with constructs that are shown to predict positive educational outcomes such as motivation (Klem & Conell, 2004; Furrer et al, 2006) and student satisfaction (Kuh & Vesper, 1997; Kuh et al, 2005). Engagement research developed from Astin’s (1984) work on ‘involvement’ and as such refers more to a “psychological investment in learning” (Newmann, 1992) than attainment. That is not to say the two are not linked however, with numerous positive relationships being demonstrated (Appleton et al, 2006; Astin, 1977; Tross et al, 2000; Pike et al, 1997). Engagement definitions vary however, Pike et al (2011) notes nearly all are “based on the premise that what students learn…is a function of how they spend their time and energy (Kuh, 2003)”. Fredricks et al (2004) suggest there are different dimensions to engagement thus the “engaged” student would be one would physically attends lectures (behavioural), places value on their work (emotional) and meets requirements (cognitive). Therefore instead of viewing engagement as an independent construct (Connell & Wellborn, 1991) a better conceptualisation would be a ‘Meta –construct’ in which Behavioural, Emotional and cognitive engagement overlap.

Engagement is frequently regarded as instrumental in educational success, whether that be influenced by on-campus living (Pike & Kuh, 2005; Terenzini et al, 1996) or extracurricular activities (Scott, 2006; Pascarella & Terenzini, 1991), the result is disengaging has detrimental effects.

Consequently, Trowler (2010) in a review of the engagement literature raised the concern “if students are not engaged, what are they?” and in a move away from positive psychology researchers have sought answers about engagement in its hypothesized antitheses. Two of which are disaffection (Skinner et al, 2009) and alienation (Mann, 2001) although the most commonly studied is burnout.
Shaufeli et al (2004) propose ‘burnout’, which positively correlates with ‘disengagement’, is characterised by declining classroom numbers, less participation and special requests (e.g. extensions) owing to other commitments (McInnis, 2002). Mashclach and Leiter (1997) conceptualised burnout and engagement as two ends of a continuum with their measurement scales both referring to one underlying general, undifferentiated dimension (‘well-being’). However, Confirmatory-Factor Analysis contradicted this in that they do not load on one underlying general factor and instead are two separate underlying constructs, which are significantly and negatively related (Shaufeli et al, 2002).

Burnout also correlates with perceived-stress and lower ratings of clinical competency in medical residents (Hillhouse et al, 2000) suggesting a negative relationship with performance (Scott et al, 2000). Correspondingly, McCarthy et al (1990) found a significant relationship with cumulative grade average however; Garden (1991) only found effects on perceived performance.

From the literature discussed the following hypothesis are proposed:

H1: Perceived and objective debt will have a significant positive relationship with stress, part-time work and a significant negative relationship with engagement.
H2: Stress will have a significant negative relationship with engagement
H3: SES will have a significant negative relationship with part-time work, objective and perceived debt
H4: Part-time work will have a significant positive relationship with stress and negative relationship with engagement

Method

Participants

Cluster Sampling was utilised in order to select one hundred participants for the questionnaire- based study (F=64, M=36), criteria for the sample was participants must be full-time final year Manchester Metropolitan University undergraduate students. Of seven campuses two were excluded due to distance leaving a remaining five between which the questionnaires were disseminated. Geographically clustering the sample recruits students on various courses as stress research has often relied on students studying particular vocations such as medicine or psychology (Robotham, 2008) which has been purported to bias results as these courses may attract a certain type of person more susceptible to stress or may be more stressful in nature due to the dual-role of student-practitioner (Clark et al, 1986). The age of participants ranged from 20-44 and the mean age was 22.9 (SD=4.61). Information was obtained from MMU’s legal department regarding the demographic characteristics of the student population (Appendix.1) in order to see if the sample was representative. 41.25% of the MMU student population is male and 58.75% is female, the sample included a slightly higher percentage of females (64%) but still represents the gender layout well. Additionally the information shows approximately 72.1% of MMU students are aged between 18-24 with only 16.98% being 30+, again the sample reflects this trend with 85% being 18-24 and 15% older.
Measures

Firstly, in accordance with BPS ethical guidelines, ethical approval from MMU was sought (Appendix.2) before any research was undertaken. During data collection students were presented with a brief explaining the research and providing details of where it can be accessed should they wish to do so. A consent form was also presented prior to participation (Appendix.3) informing participants of their anonymous and right to withdraw at any time. Participants were aware of their involvement and were not deceived and as such made an informed decision to partake. There are no underlying issues, participants are not placed in any harm however, because of some emotive features a sheet containing MMU financial and counselling contact details was included.

The first section of the questionnaire utilises a debt-stress index created by Drentea and Lavrakas (2000) which they used to study the associations between health, race and debt. It comprises three questions asking how worried a person is about debt, responses are marked on a 0-4 likert scale with 0=not at all and 4=all of the time. By totalling the responses and multiplying by 8.3 a 0-100 score can be obtained with higher numbers representing more debt-stress. The scale has good reliability (α=0.861) but only looks at perceived not actual debt; which will presumably be relative to each individuals perception of what is a worrying amount of debt. For example, those from low socioeconomic-status’s (SES) or low-income backgrounds may believe £1000 to be a considerable amount of debt whereas someone from a middle class background would perhaps consider this minimal. Correspondingly, Biliski (1991) found significant differences in students financial behaviour related to SES, in that low-SES students borrow substantially more than their financially comfortable counterparts. Although this is anticipated, scholars have also found low-SES groups have an increased wariness for debt (Mortensen, 1989) presumably as they have little means to pay it off, this hesitance to borrow is surprisingly greater for educational debt (Bell et al, 2001). Nonetheless it has been observed that those who can afford the least borrow the most against their future (Micomonaco, 2006) and therefore supplementary questions about actual debt and family income (as a rudimentary measure of SES) are included to assess these notions.

The second section of the questionnaire is Cohen et al’s (1983) ‘Perceived-Stress Scale’. As discussed earlier stress measurement is diverse due to inconsistent definitions and because of this incongruity, numerous measures have been developed that are not universally applicable. For example, Holmes and Rahe’s (1967) ‘Social readjustment scale’ is unsuitable as it defines stress as an external event. It is vital again now, to emphasize the proposed research conceptualizes stress as an internal reaction to external stressors appraised as challenging by the individual, which elicits behavioural changes. This mirrors Cohen’s belief that the perception of ‘stress’ influences the pharmogenesis of disorders by inducing negative affective states (e.g.anxiety) which exert direct effects on behaviour (Cohen et al, 2007). Although Cohen concentrates on stress-related disease, the scale itself is appropriate to this research, as it focuses on the subjective evaluation ‘stressful’ situations, supporting the notion that the perception of stress influences subsequent behaviour by altering the internal state of an individual. Unlike Holmes and Rahe’s it does not focus on stimulus or response variables but on the transaction between the
individual and their environment with appraisal as a central element. This shifts the focus onto the psychology of stress allowing one to interpret whether debt is an objective stressor directly affecting engagement or whether it contributes to perceived-stress thus having an indirect affect. The 10-item scale has been shown to have good reliability (α=0.78) and construct validity as scores correlate with other measures of appraised stress and measures of prospective sources of stress as assessed by event frequency (Cohen & Williamson, 1988). Studies have also shown it to have good predictive validity, successfully predicting the common cold (Cohen et al, 1991), failure to quit smoking (Cohen et al, 1983) and depressive symptoms (Hewitt et al, 1992).

Although Cohen and Williamson (1988) provide some normative data based on a 1983 Harris poll (N=2,387) the PSS is not a diagnostic tool and as such only in-group comparisons can be made, however higher scores generally indicate more stress. Scores are calculated by reversing four items (4,5,7,8) and then summing across the complete instrument.

The final part of the questionnaire is the National Survey of Student Engagement which looks at how much students participate in educationally purposeful activities and how well their institution supports this (Kuh, 2001). Both quality-of-effort and time on task have been shown to correlate with educational outcomes (Astin, 1984; 1999) however it is now accepted that a positive educational experience requires support from the institution (Coates, 2005; Kuh, 2009).

Concurrently, both Harrington and Schibik (2004) and Ehrenberg and Zhang (2004) found part-time faculty was negatively associated with student retention whilst Martinez (2001) in his review proposed good teaching and course satisfaction were the best predictors of low dropout rates, although much of this was based on unpublished literature (Bennet, 2003).

The NSSE constructed five benchmarks or indicators of effective educational practice (essentially engagement) supposedly predictive of learning and development (Creighton et al, 2008). These are Level of Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, Enriching Educational Experiences and Supportive Campus Environment. 41 of the 85 items group into these categories and when responses are converted into 0-100 scores their means give average scores of an institutions level of engagement to be used as targets to be upheld or improved.

The NSSE originates in Indiana, which could limit the research as cultural differences vary interpretations. However, UK-based studies of engagement are typically qualitative and often entrenched with other concepts (Trowler, 2010) and as the NSSE has been utilised worldwide (e.g. China, Canada, Australia) there seems no reason it should not translate to the UK. Furthermore, Creighton et al (2008) and Taylor et al (2011) have both successfully administered NSSE scales at Reading and Warwick University.

NSSE copyright belongs to The Trustees of Indiana University therefore NSSE Director Dr. Alex McCormick was contacted and an item usage agreement created and signed by both parties in order for the NSSE to be administered legally (Appendix.4).
It is to acknowledge that the psychometric properties of the NSSE have been contested (Porter, 2009; Korzekwa, 2007). Pike (2006) questioned the benchmarks relationship to engagement suggesting they have little predictive validity and recommending NSSE scalelets are superior owing to their strong relationship with self-reported gains. Additionally LaNasa et al (2009) suggested an eight-factor structure fit their data better, conflicting with the five-factors suggested by NSSE, thus casting doubts on the scales construct validity.

Consequently, in the current research an auxiliary scale was implemented to allow for use of an alternative should the psychometric properties of the NSSE prove to be suboptimal.

The UWES was created by Shaufeli et al (2002) who hypothesize that engagement is the direct opposite to burnout as measured by the Maslach Burnout inventory (1981). Burnout here refers to the three-dimensional syndrome of emotional fatigue comprising exhaustion, cynicism and professional efficacy. The UWES encompasses three supposed opposite factors; vigour, dedication and absorption. The modified scale (for use with students UWES-S) has good internal consistency (vigour $\alpha=0.78$, dedication $\alpha=0.89$ absorption $\alpha=0.72$) and is well validated cross-nationally being successfully implemented in Japan (Shimazu et al., 2008), China (Yi-Wen & Yi-Qun, 2005) and Africa (Storm & Rothmann, 2003). The scale demonstrates good construct validity with the consistent emergence of the three-factor structure.

Alternative engagement method include case studies (Davies, 2002), peer ratings (Skinner & Belmont, 1993) and direct observations (McIntyre et al, 1983) However, practical constraints mean self-reports are a more suitable method. Self-reports are used extensively, however the reliability of the data they generate “varies substantially with students’ abilities to assess their own cognitions, behaviours, and affective responses” (Assor & Connell, 1992). Other engagement scales were considered (SEI, HSSSE and the AES-GS), however some focused on KS2-education inapplicable to HE students whereas others focus on cognitive and psychological engagement (Appleton et al, 2006) excluding behavioural and emotional which are presently of major focus. Moreover, the scales mentioned have been considerably less utilised than the NSSE and less verified than the UWES-S.

Cross-sectional approaches are amenable in applied settings however, they are not unproblematic; Podsakoff and Organ (1986) identified several concerns including common method variance (Campbell & Fiske, 1959), consistency motif and social desirability (SD). These occur when different constructs are measured using the same method and/or when their language is analogous. They suggest several remedies such as post hoc testing and scale trimming, however these are statistical remedies whereas procedural changes such as escalating the unit of analysis are supposedly more effective. Some, such as scale trimming, are inappropriate as this involves eliminating overlapping items, yet extracting items from established scales reduces their validity. Others remedies were viable; scale reordering involves placing the DV prior to the IV thus reducing consistency artifacts by preventing response bias based on lay theories (Salanick & Pfeffer, 1977) therefore the NSSE was presented first. SD could affect the scales although Miller (2011) found non-significant correlations between NSSE and SD scores. Still as all three scales are
emotive, it is important to acknowledge S.D’s ability to restrict variance in scale scores, which could weaken correlations.

Data analysis

Data was successfully input into LISREL8.51 using graphical interface and a model was specified using a path diagram. SPSS version 19 was then used to analyse data in the form of Pearson’s correlations to assess which variables correlated with each other and step-wise multiple regressions were performed to find out which variables best predicted stress and engagement.

Results

Descriptive Statistics

Table 1 shows the means and standard deviations for age, sex, engagement, debt, SES, perceived-stress and debt-stress from the raw data. The average age of participants was 22.9 and the average educational debt was approximately £18,000. 48% of the sample were from low-SES backgrounds, 22% were from middle-SES backgrounds and 30% were from a higher-SES backgrounds as judged by annual household income.

For the low-SES students mean debt was £20,063.54 (SD=6969.93) for middle-SES students was £17,909.09 (SD=9871.36) and for higher-SES students was £15,343.33 (SD=9409.19). Females tended to borrow slightly more F=£19075 (SD=850605) M=£16570.83 (SD=8487.76). The means also show that on average students only reported moderate stress (20.02, SD=6.61) and extremely low debt-stress (13.93, SD=10.04).

Table 1

| Descriptive Statistics for Variables Related to age sex, engagement, debt, SES, PSS & DSI (N = 100) |
|----------------------------------|-----------|-----------|
| Age                             | Mean      | SD        |
| StuEng                          | 60.96     | 19.10     |
| ObjDebt                         | 18173.50  | 8593.12   |
| SES                             | 1.82      | 0.87      |
| PSS                             | 20.02     | 6.61      |
| DSI                             | 13.93     | 10.04     |
Psychometric properties

According to Nunally (1978) the minimum value for questionnaire scales to be considered reliable is $\alpha \geq 0.7$ therefore internal consistency analyses in the form of cronbach's alpha were run and yielded the DSI ($\alpha = 0.814$), the PSS ($\alpha = 0.859$) and the NSSE ($\alpha = 0.804$) to all be reliable.

However, a principal components analysis (PCA) with varimax rotation of the 85 NSSE items yielded a twenty-seven factor solution, this was subsequent to Bartletts test of sphericity (1954), which tests whether the correlation matrix is an identity matrix which would indicate that the factor model is inappropriate. The test was significant ($p < 0.001$) allowing us to infer that the data were adequately distributed.

The twenty-Seven components had eigenvalues above the Kaiser criterion of one (1960) and this solution explained in total 79.2% of the variance in the correlation matrix. This meant that the 5-factor model corresponding to NSSE’s benchmark scores did not fit the data. Furthermore, the rotation failed to converge in 25 iterations (Convergence = 0.059) which means only the factor loadings and main results of the analysis before rotation are shown (Appendix.6). It is worth mentioning that Kaiser-Meyer-Olkin, a measure of sampling adequacy, only yielded a value of 0.28, which is suboptimal for factor analysis; generally, values of 0.5 are considered acceptable and above 0.9 are ideal. Furthermore, Costello and Osborne (2005) state although PCA with orthogonal varimax rotation is the ‘norm’ in most social science research, it is far from the best, suggesting Exploratory factor analysis is a superior method however due to the small sample size of this research and the literature suggesting the differences between the two methods are minimal (Velicer & Jackson, 1990; Arrindell & Van der Ende, 1985; Schoenmann, 1990) PCA was deemed suitable for the present research. The plot of the 85 eigenvalues is presented in figure.1
A second auxiliary scale was implemented, the UWES-S, and also subjected to PCA with orthogonal rotation (varimax). This revealed four components, which had eigenvalues above the Kaiser criterion of one, and in total, these explained 69.43% of the variance amongst the items. Table.2 shows the factor loadings after rotation and the main results of the analysis before and after rotation. It was expected only 3 components would be extracted from this scale pertaining to Vigor, dedication and absorption which initially caused concern. However, given that the eigenvalue for Factor 1 was large compared to the eigenvalues for the other three factors this indicates a single first order factor, in which all items load freely on the factor, may be sufficient to explain the relationships between the items. This factor is hypothesized to relate to “overall engagement” (see table?). The UWES-S had good overall reliability (α=0.913) as did its component parts; vigor (α=0.803), dedication (α=0.870) and absorption (α=.872)
Table 2

Summary of a Principal Component Analysis with Varimax Rotation for the 17 item UWES-S scale (N=100)

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Eigenvalues

|            | 7.39 | 1.77 | 1.38 | 1.25 |

Percentage Variance before Rotation

|            | 43.5 | 10.43 | 8.09 | 7.42 |

Percentage Variance with Rotation

|            | 21.15 | 20.27 | 16.23 | 11.77 |

Note: loadings over .4 are underlined, although there is much debate within psychology about statistically significant factor loadings for a small sample sizes (Velicer & Fava, 1998; Guadagnoli & Velicer, 1988; Arrindell & Van der Ende, 1985) a general rule is that loadings below .4 are weak and above .6 are strong (Garson, 2010).

Again, Kaiser-Meyer-Olkin and Barlett’s test of sphericity were completed and this time Kaiser-Meyer-Olkin produced a value of .868 signifying the item to participant ratio was sufficient to run a PCA. Bartlett’s was also significant (p<0.01). The plot of the 17 eigenvalues is presented in figure.2
Figure 2  Plot of the eigenvalues on 17 items in the data set.

Measures of skewness were ran on all data including age, sex, debt-stress, perceived-stress, part-time work, care provision, engagement and objective debt to assess whether the data was normally distributed. Skewness is a measure of symmetry, or rather; lack of symmetry, a perfectly normally distributed data set is symmetric and would mirror a typical bell curve (Maimon & Rokach, 2005). All the variables were normally distributed that is their skewness statistic was less than double their standard error which can be seen in the SPSS output in Appendix. All that is except debt-stress, this means all but debt-stress satisfy the requirements for parametric statistics. However, Coolican (1994) states that one can do a parametric test on data which do not precisely fit the assumptions. The fact that the tests, under such conditions, still give fairly accurate probability estimates has led to them being called robust.

Correlations

Correlations were run, all of which can be seen in table 4 and a number of significant correlations emerged. Age was found to be positively correlated with care provision ($r=0.452$, $p<0.01$), Debt-stress ($r=0.220$, $p<0.05$), Engagement ($r=0.289$, $p<0.01$) and especially the dedication ($r=0.246$, $p<0.05$) and absorption ($r=0.416$, $p<0.01$) subscales of engagement.

Care provision was also found to be positively correlated with perceived stress ($r=0.241$, $p<0.05$) and debt-stress ($r=0.315$, $p<0.01$).
Objective debt was negatively associated with socio economic status \( (r = -0.238, p < 0.05) \) and positively associated with debt-stress \( (r = 0.415, p < 0.01) \).

Socio economic status was found to be negatively associated with debt-stress \( (r = -0.226, p < 0.05) \) and absorption \( (r = -0.220, p < 0.05) \).

Perceived stress was found to be positively associated with dedication \( (r = 0.235, p < 0.05) \).

Table 3

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Sex</th>
<th>PTW</th>
<th>CareProv</th>
<th>ObjDebt</th>
<th>SES</th>
<th>PSS</th>
<th>DSI</th>
<th>StudEng</th>
<th>Vig</th>
<th>Ded</th>
<th>Abs</th>
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<tr>
<td>CareProv</td>
<td>452**</td>
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</tr>
<tr>
<td>ObjDebt</td>
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<td>1.00</td>
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<td>-0.53</td>
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<tr>
<td>PSS</td>
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<td>0.18</td>
<td>0.007</td>
<td>2.411*</td>
<td>0.311</td>
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</tr>
<tr>
<td>DSI</td>
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<td>0.099</td>
<td>-0.46</td>
<td>3.15**</td>
<td>4.15**</td>
<td>-2.26**</td>
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<td>1.00</td>
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<td>StudEng</td>
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<td>0.016</td>
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<td>1.96</td>
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<td>Vig</td>
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<td>0.051</td>
<td>0.007</td>
<td>-0.020</td>
<td>0.089</td>
<td>-0.058</td>
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<td>0.017</td>
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<td>-1.32</td>
<td>0.253*</td>
<td>0.038</td>
<td>0.844**</td>
<td>0.542**</td>
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<td>Abs</td>
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<td>0.018</td>
<td>0.078</td>
<td>-0.019</td>
<td>-2.20*</td>
<td>0.147</td>
<td>0.030</td>
<td>0.872**</td>
<td>0.527**</td>
<td>0.633**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level
* Correlation is significant at the 0.05 level

Structural Equation modelling (SEM)

An attempt was made to specify a model via Lisrel 8.51 (output available in Appendix.8) SEM analyses pooled variance allowing us to study complex relationships between variables and begin to assume causation by pinpointing which aspects of the proposed model are in conflict with the data. The model (Appendix.9) was input using a graphical interface with the hope LISREL would estimate an ideal covariance matrix from start values derived from the data. Unfortunately, the matrix to be analyzed was not a positive definite (i.e. not all of its eigenvalues were positive) which meant the model could not converge. These types of errors occur for a number of reasons such as linear dependency, data reading errors, sampling variation and missing data (Wothke, 1993). The source of the models failure to converge could not be identified however, as Field (2000) notes “The benefit of SEM over other approaches such as ANOVA or regression is simply the flexibility with which models can be built”. Therefore, multiple regression was implemented to highlight relationships between the variables, the only caution however is that causation cannot be inferred from these results and reverse explanations must be considered.

Multiple regression –Engagement
Multiple regression analyses were conducted in order to establish which variables best predicted student engagement. Predictor variables were entered into the models according to prior found significant correlations and from previous literature.

The predictor variables included into the model were objective debt, debt-stress, age, sex, perceived-stress and socioeconomic-status. The adjusted $r$ value tells us that the model only accounted for 8.5% of the variance in student engagement, hence not a very good model. The overall significance of the model was not significant at the 0.01 level more commonly used within psychology but was significant at the 0.05 level. The standardized beta coefficients give a measure of the contribution of each variable to the model however the only significant predictor was age $p.<0.01$.

Using the enter method a significant model emerged (Adj $R^2$ square =0.085; $F(6,93)$ =2.541, $p.<0.05$). Only one significant predictor is shown below

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Beta</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>0.286</td>
<td>$P&lt;0.01$</td>
</tr>
</tbody>
</table>

A second multiple regression using the stepwise method was performed to see if this improved the model as stepwise is a more sophisticated method, which enters variables into the model in sequence with each’s value being assessed independently. If a specific variable adds significantly to the model it is retained however upon its retention all other variables are then re-tested to confirm whether they still add value to the model, if they do not they are removed (Brace et al, 2009). Stepwise regression therefore calculated the variance each predictor added to the model successively.

Stepwise added only age to the model and excluded all other variables, age accounted for 7.4% of the variance, again significant at the 0.05 level. Thus, the final model to emerge contains only one predictor variable, age (Adj $R^2$=0.083; $F (1,98)=8.899, p.<0.05$). No other variables statistically strengthened the model as is shown below in table 4.

Table 4

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>t</th>
<th>Sig.(p)</th>
</tr>
</thead>
<tbody>
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<td>Constant (intercept)</td>
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<td></td>
</tr>
<tr>
<td>Age</td>
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<td>.29</td>
<td>2.87</td>
<td>.005</td>
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<td>Sex</td>
<td>1.23</td>
<td>.03</td>
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<td>.75</td>
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<td>ObiDebt</td>
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<td>-.42</td>
<td>.67</td>
</tr>
<tr>
<td>SES</td>
<td>-.20</td>
<td>-.14</td>
<td>-1.33</td>
<td>.18</td>
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<td>PSS</td>
<td>.91</td>
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<td>.07</td>
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<tr>
<td>DSi</td>
<td>-.20</td>
<td>-.11</td>
<td>-0.96</td>
<td>.34</td>
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</table>
Multiple Regression – Engagement subscales

Based on these findings and the correlations found another stepwise multiple regression was performed to assess relationships between the aforementioned variables and the subscales of engagement (vigour, dedication and absorption). No variables were found to significantly account for variance in vigour (shown in table 5) However age accounted for 16.5% of the variance in absorption scores, Adj $R^2 = 0.165$; $F (1, 98) = 20.522, \ p < 0.01$ (table 6) and 5.1% of the variance in dedication scores Adj $R^2 = 0.051$; $F (1, 98) = 6.31, \ p < 0.05$. Furthermore perceived stress accounted for 9.2% of the variance in dedication scores, Adj $R^2 = 0.092$; $F (2, 97) = 6.029, \ p < 0.01$ (table 7).

**Table 5**

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Sig.(p)</th>
</tr>
</thead>
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<td>Sex</td>
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<td>.25</td>
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<td>.07</td>
<td>.61</td>
<td>.54</td>
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<td>.71</td>
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<td>PSS</td>
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<td>.14</td>
<td>1.29</td>
<td>.20</td>
</tr>
<tr>
<td>DSI</td>
<td>-.09</td>
<td>-.12</td>
<td>-1.03</td>
<td>.30</td>
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<tr>
<td>Age</td>
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<td>.05</td>
<td>.49</td>
<td>.62</td>
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</table>

**Table 6**

<table>
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<td>.06</td>
<td>.63</td>
<td>.53</td>
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<tr>
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<td>.79</td>
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<td>.06</td>
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<tr>
<td>PSS</td>
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<td>.14</td>
<td>1.48</td>
<td>.14</td>
</tr>
<tr>
<td>DSI</td>
<td>-.10</td>
<td>-.12</td>
<td>-1.14</td>
<td>.26</td>
</tr>
<tr>
<td>Age</td>
<td>.75</td>
<td>.41</td>
<td>4.38</td>
<td>.00</td>
</tr>
</tbody>
</table>
Multiple Regression – Perceived-stress

A further stepwise multiple regression analysis was conducted to see which variables best accounted for the variance in perceived stress. Stepwise added only two variables into the model, debt-stress and sex. Model 1 which included only debt-stress accounted for 10.8% of the variance (Adj $R^2=0.108$). The inclusion of sex into model 2 resulted in an additional 5.9% of the variance being explained ($R^2$ change =0.059). Thus 15.9% of the variance in perceived stress can be explained by debt-stress and sex (Adj $R^2= 0.159$; $F (2, 97)= 10.348$, $p.<0.001$). No other variables statistically strengthened the model as shown below in table 8.

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$\beta$</th>
<th>$t$</th>
<th>Sig. ($p$)</th>
</tr>
</thead>
<tbody>
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<td>Constant (intercept)</td>
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<td>1.12</td>
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<td></td>
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<tr>
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<td>.11</td>
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<td>.25</td>
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<td>PSS</td>
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<td>.04</td>
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<td>.80</td>
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<tr>
<td>Age</td>
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<td>.02</td>
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Multiple Regression – Perceived-stress

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Simple Regressions- Socioeconomic-status, objective and perceived debt and part-time work

Additionally three general linear regressions were conducted to assess relationships between SES and objective/perceived debt and part-time work, the reason for this is that predictor variables in SPSS must be either continuous or dichotomous (McNeil et al, 1996). As Socioeconomic-status is categorical it must be analysed as a criterion variable, this is suitable for this type of data as we know a reverse explanation is implausible (objective/perceived debt and part-time work do not cause socioeconomic-status). Analyses showed that SES accounted for 4.7% of the variance in objective debt (Adj R²=0.047; F (2, 97)= 5.862, p.<0.05), 4.1% of the variance in debt-stress (Adj R²=0.041; F (1, 98)= 5.276, p.<0.05) and did not significantly predict scores in part-time work.

Discussion

The main prediction for this research was debt would have a positive relationship with stress and correspondingly stress would have a negative relationship with engagement; in terms of the latter, this was not the case. What was actually found was that the only significant predictor of engagement was age (Adj R² =0.085; F(6,93) =2.541, p.<0.05) thus H2 was not supported.

Contrary to what was expected, stress actually had a positive relationship with dedication (Adj R² = 0.092; F (2,97)= 6.029, p.<0.01) accounting for 9.2% of its variance. Therefore students experiencing higher levels of perceived-stress actually had increased dedication to their degree, this could be an indicator of ‘eustress’.

The concept of eustress ties in with Yerkes-Dodson-law (1908) which states that there is an empirical relationship between performance and arousal but only to a certain point, if arousal passes a threshold then performance will start to deteriorate presumably as perceived demands get too high. In terms of students this would translate as such, a moderate amount of stress (arousal) would be sufficient to motivate students into pushing themselves to gain higher grades however too much stress would be detrimental. Thus, the observed relationship between stress and dedication could be an indication that student-stress is not always damaging. This notion is supported by both Whitman et al (1985) and Busari and Uwakwe (2001) who proposes stress is an essential part of university life, also Monk (2004) found in case studies of 45 students those with high-stress had greater academic attainment than those with low-stress.

Nevertheless, numerous studies have failed to show linear or curvilinear relations between stress and performance (Lens &De Volder, 1980; Arndt et al,1986; Tooth, et al, 1989) which casts aspersions on Yerkes-Dodoson-Law in a HE context.

One way to verify the presence of eustress or Yerkes-Dodson-law would be to re-test the sample during the exam period (increased stress) and obtain exam results to check for curvilinear associations. For the purposes of the research at present and given the practical time constraints this is currently unfeasible but could be promising for future investigation.
In terms of the effects of debt, scores on the Debt-stress index (DSI) did account for significant variance in perceived-stress, surprisingly along with sex, which was not included in the initial hypothesis (Adj R² =0.108; F(2,97)=10.348, p.<0.001) hence H1 was partially supported. Objective-debt on the other hand was not a significant predictor, supporting both the present researches and Baker and Barker’s (1997) claim that students’ perceptions of their own levels of debt rather than level of debt *per se* relates to stress. Thus appraisal is a central element. However, as regression cannot tell us the causal direction (Smith,2011), it must be considered that an increase in stress, perhaps study-related, could inflate perceptions of debt severity, as stress has been shown to correlate with negative affectivity and depression (Breif et al,1988; Montpetit,2007; Jacobs,2006). Therefore, an increased awareness for the negative aspects of life could cause the observed perceived-debt and related stress. Although a positive correlation was observed for perceived and objective-debt (r= 0.415, p.<0.01) suggesting the sample had quite a good understanding of their situation as those with higher debt exhibited more debt-stress.

H3 specified socioeconomic-status (SES) would have a significant negative relationship with part-time work, objective and perceived-debt, this was again partially supported. SES had a significant negative relationship with objective debt (Adj R² =0.047; F(2.97)= 5.862, p.<0.05) supporting Biliski’s (1991) finding that low SES students borrow significantly more than their wealthier counterparts. A negative relationship was also evident for perceived debt (Adj R² = 0.041; F(1,98)= 5.276, p.<0.05), concurrent with Mortenson (1989) and Bell et al’s (2001) suggestion that low-SES students are uncomfortable with accumulating educational debt. No relationship was observed between part-time work and SES or any of the other variables in conflict with a large body of literature (Rolfe,2011; Humphrey, 2006; Metcalfe,2003). Thus H4 was not supported, one explanation for this may be that the sample only included final year students, a lot of whom have been shown to quit work in their last year, although Purcell and Elias (2010) suggest this is a declining trend.

As mentioned above sex was a significant predictor of stress with females experiencing notably higher levels of stress than males, one possible explanation for this which has much support within the literature is that females are simply more prone to stress and stress-related disorders (Levenson et al,1983; Matheny &Cupp, 2005; Haynes &Feinleib,1980; Cooper &Davidson,1982). An alternative explanation, one which is favoured here, is that modern women undertake a dual-burden (Ferri &Smith,1996) in which they work (or study) during the day but also have the responsibility of unpaid domestic labour when they return home, this has been referred to as ‘emotion work’ (Hoschild,1979). The results of this research support the latter as correlations between care provision and perceived-stress were found (r= 0.241, p.<0.05). Yet contrarily no such correlation was found between care provision and sex, therefore this effect cannot be generalized to females.

Care provision also significantly correlated with debt-stress, which is interesting as although students with children tend to borrow more, there was no correlation between objective-debt and care provision. This would suggest that students with external care demands do not have more actual debt but worry about it significantly more.

To explain this effect the influence of age must be looked at again as this also significantly correlated with care provision (r= 0.452, p.<0.01), debt-stress (r=
0.220, p.<0.05) and, as previously discussed, student engagement, dedication (r=0.246, p<0.05), stress, and absorption (r= 0.416, p<0.01).

The finding that as age increases so too does engagement, especially in terms of dedication and absorption, may simply indicate that older people take their course more seriously. However, considering age has relationships with numerous other variables may demonstrate that it plays a general role across all factors involved in the model. This leads the present researcher to suggest there is a latent variable present that has not been previously considered, a variable related to psychosocial maturity (Erickson, 1997).

Maturity generally refers to one’s ability to respond appropriately to situations within your environment, in the present research it refers profoundly to financial awareness. There have been numerous studies concerning student’s lack of financial knowledge and their naivety when undertaking the responsibility of a substantial and possibly life-long educational-debt (Allen & Kinchen, 2009; Xiao et al, 2009; Robb & Sharpe, 2009). Many have been financially dependent on their parents before university and as such have not completed what Shim et al (2010) refer to as “financial socialization”.

It has been suggested many underestimate the actuality of paying the debt off in terms of how long it will take and how much the repayments will be (Norvilitis et al, 2006). Furthermore, Betts (1996) suggests student’s estimations of future prospective income is often inflated and doesn’t take into account tax and national insurance.

Care provision and age are relevant here as students with children are often self – sufficient, responsible for their own (and another’s) actions and are financially independent, all of which are main markers of adulthood (Arnett, 2004; Hendry & Kloep, 2007) and could possibly indicate increased financial knowledge.

It would then seem that only “mature” students, that is in the true essence of the word not just in age, grasp the practicality and gravity of an £18,000+ debt. This is evident in the fact that both age and care provision are positively associated with perceived but not objective-debt, signifying that these groups do not borrow more but have an increased awareness of debts negative connotations.

That is not to suggest that only older people or those with children are mature or financially aware, although this does generally seem to be the case regarding age (Sheldon & Kasser, 2001), but that maturity is a variable that requires inclusion when looking at debt, stress and engagement among students.

The above findings then would provide support for Dwyer et al’s (2011) conclusion that as age increases positive debt-effects are diminished and negative effects arise, presumably as the debt becomes more burdensome, or in this case as students come to realize the reality of their situation.

Overall, the results obtained do support the notion that debt, stress and student engagement are interrelated however the directions of these relationships and the variables which intercede them, are still unclear. Further research may benefit from an increased focus on maturity, using a scale such as Winston and Millers (1987)
Student Developmental Task and Lifestyle Inventory. This assesses student’s psychosocial development by measuring their ability to master the tasks and attitudes they need in order to function successfully within an academic context. It is the prediction of the present researcher that this will mediate the relationship between debt, stress and engagement.

Additionally, an added focus on financial awareness is required, perhaps in the form of The Survey of Personal Financial Literacy (Chen & Volpe, 1998) as it is the conclusion of this study that younger students with poor financial knowledge are sheltered from negative debt-effects by their naivety. [6953]

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