INDIVIDUAL DIFFERENCES IN EDUCATION AND WELLBEING: THEORETICAL, EMPIRICAL AND PEDAGOGICAL PERSPECTIVES AND APPLICATIONS

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Abstract

The aim of the project was to identify and commend the individual difference factors that enhance the overall student experience with reference to academic performance and wellbeing. Psychological theories and constructs provided the context for the research including Trait Personality, Social Cognitive Theory, Anxiety, Depression, Emotional Intelligence and Optimism. Empirically, the measures selected were established by meta-analyses but innovation was provided by the way the models were configured, as they were set up as distal and proximal predictors of outcomes. Pedagogically, the study identified the non-ability related individual differences that impact adaptively on academic performance and wellbeing, that will assist both tutors and students in supporting learning, enhancing achievement and facilitating an adaptive approach to wellbeing to optimise the whole student experience. This study employed both within and between participants, cross-sectional analysis combined with concurrent and archival longitudinal data, and a quasi experimental study. The research was carried out at LJMU on Psychology students (N=404) from across levels 4 and 5 who took part in the cross-sectional aspect of the study; and a small sub-sample from TAR college (N=32) who took part in the experimental study. Methods included use of validated self-report measures and academic performance indicators. Strategy for analyses included exploring descriptive statistics, testing associations by correlations and developing significant associations into a variety of multivariate methods including multiple regression, ANOVA, path analysis, factor analysis and structural equation modelling. Results were substantive as indicated by effect sizes which explained up to 20% variance on academic performance and up to 47% variance on wellbeing. Outcomes contributing to knowledge include: stability of self-report measures providing normed referencing across cohorts; the identification of distal and proximal predictors that suggest pathways and processes to academic performance and wellbeing; an extensive map is provided for predictive space, outcome space and their links; a combination of academic and wellbeing factors are endorsed within one integrated study; protective factors for students that facilitate retention and adaptation to university life have been identified.

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Brief overview of thesis

This thesis identifies the non-ability related individual differences that impact adaptively on academic performance and wellbeing. The introduction and theoretical context provides an overview of the theoretical background and comments upon the main aims and contribution to knowledge.

Chapter 1: Provides an investigation into the impact of personality and academic performance. In addition to broad factor analysis it delves into analysis at item level and employs a broad range of academic performance indicators not knowingly used in combination before. Academic indices of performance include coursework, exam, module and level grades for levels 4 and 5. This chapter also creates the basis for programme norms.

Chapter 2: Considers the self-efficacy and test anxiety relationship and their proximal impact on academic performance. General self –efficacy and academic self-efficacy are explored and the research attempts to determine which measure is the most robust indicator of academic achievement. Whether self-efficacy provides a buffering effect against test anxiety is also explored. Again this study employs a broad range of academic performance indicators but in addition to chapter 1 it employs both concurrent and archival performance data from levels 4, 5 and 6.

Chapter 3: Explores the relationship between emotional intelligence and academic performance. Four constructs of emotional intelligence are employed which adds a unique aspect to this study; the configuration of the constructs is analysed to test the uniqueness and overlap between constructs. As with chapter 2 a broad range of academic performance indicators will be employed including data from across levels 4, 5 and 6. As chapter 1, normed patterns on means and standard deviations will be tested across cohorts; this provides a good demonstration of the validity of the constructs.

Chapter 4: The main theme considers the impact of emotional intelligence on wellbeing and quality of life, beyond that of personality. In the second section the students' wellbeing scores are aligned with a broad range of academic performance indicators. The results are presented in sections, the first relating to emotional intelligence and wellbeing; followed by presentation of the findings for wellbeing and academic performance; these findings are then discussed.

Chapter 5: This chapter takes on a different form and in addition to self-report measures and academic performance indices there is an experimental aspect. The introduction to this chapter considers aspects of sleep relating to the self-report constructs used throughout this thesis and discusses the relationship between sleep and academic performance and sleep and wellbeing. For the main part of this study, the focus is on the differences in sleep between high and low workload. No study, known to the researcher, has explored the aspects employed in this study in such a comprehensive manner.

Finally, the general discussion brings together the main aspects of the thesis in a summary. Limitations and future directions, pedagogical applications, overall findings and contribution to knowledge are outlined.

INTRODUCTION

THEORETICAL CONTEXT, OVERVIEW AND AIMS

Successful performance is important to a student's future career (Dhull, 2013) and as such their learning affects the community at large (Elias, 2006). With educators being interested in developing their students as academically and socially capable individuals (Elias, 2009), this research is not only interested in performance outcomes, it is also concerned with the behavioural, emotional and cognitive processes that lead to successful performance. Therefore it will trace these processes through exploration of the operational components of the various constructs, and thus highlight the process as well as the end product of performance. It is expected that the outcome of this research will create a rounded picture and inform a better understanding of the aspects that contribute to academic achievement at university. Such factors may be vital in relation to whether a student achieves a good degree and will therefore be an important aspect of the project. In addition to academic performance and its processes, students' wellbeing and quality of life will also be addressed.

Limitations of previous grades as predictors of academic and degree performance

Empirical research on Individual Differences leads to the conclusion that it is necessary to re-examine the factors attributable to academic achievement. Traditional indicators of academic performance have been previous grades, both in relation to entrance requirements and as the main indicator of subsequent grades. Although qualifications on entry to university vary considerably, to date university admissions still rely heavily on A-level points (or other equivalent UCAS points) to decide whether a student is likely to complete their degree successfully and so whether they should be accepted onto a study programme. Farsides and Woodfield (2003) found A-level points and their equivalent were positively related to degree success when associated with overall Grade Point Average. Barrow et al., (2009) found students with two to three A-levels scoring 20 UCAS (University and Colleges Admissions Service) points or less (lower grades), access qualifications and other UK pre-entry qualifications, tended not to perform as well as individuals with three A-levels, scoring more than 25 UCAS points who were found to perform above average. This suggests that top A-level results predict a good degree classification but lower levels do not. In contrast to this study however, much research has demonstrated that A-levels have limited predictive validity in overall degree classification

across a variety of domains (Engler, 2010; Farr & Woodward, 1987; Peers & Johnston, 1994; Wolfe & Johnson, 1995). An extensive review by Peers and Johnson (1994) asserted that A-levels were limited predictors of degree performance, particularly in relation to the social sciences. Overall, research indicates limited predictive validity; this is understandable as the approach to A-levels is different to that of a university degree. A-levels involve extensive study of 1 to 2 years, with the main contribution to their mark from the exam at the end of the course; and whilst schools are moving toward more equal weighting between coursework and exams, this is not the same process as university programmes. University students take a number of modules with varied assessment throughout the year including multiple choice tests, reports, essays, case studies and final examinations. Further, in contrast to A-level requirements, university students are strongly encouraged to be independent learners (Zuffianò, Alessandri, & Gerbino et al., 2013). Students may also have many other commitments and need to balance their academic careers with work, social and family commitments, as well as adjust to a new social and political milieu. Therefore it is essential to take into account the individual differences of students, not solely relying on objective indicators such as prior academic achievement. Furthermore, it was established many years ago that students with good ability do not always achieve as they might be expected, perhaps because they do not apply themselves fully (Conard, 2006; Laidra, Pullmann, & Allik, 2007); whereas less able students may be high achievers, particularly if they apply themselves, are disciplined and assiduous. Furnham and Chamorro-Premuzic (2004) claimed that self perceptions, rather than ability, can be better predictors of behaviour as these can determine not what a person can do, but what they will do. Therefore, it is proposed that personality factors, behavioural patterns and self-beliefs will impact upon academic performance and may explain why attainments differ amongst equally capable individuals.

Limitations of intelligence in predicting academic performance

In addition to previous grades, Intelligence has been considered an important predictor of academic grades. In the current study, intelligence is referred to as an outcome of performance achieved on an IQ test, and is therefore used interchangeably with IQ. It is not considered the same as cognitive ability, which is considered to be the process that leads to a score on an IQ test. There is vast evidence to suggest that intelligence (IQ) is an important predictor of academic achievement (Busato, Prins, Elshout, & Hamaker, 2000; Furnham & Chamorro-Premuzic, 2005; Laidra et al., 2007; Rhode, 2007; Strenze, 2007;

Wolfe & Johnson, 1995). However, intelligence only accounts for a rather small percentage of variance in academic performance, Munteanu, Costea and Palos (2011) and Trapman et al., (2007) suggest about 25%. The relevance of intelligence to academic performance is also thought to decline with age, with the highest correlation being at primary level, followed by secondary and then losing significant validity at tertiary level (Furnham & Chamorro-Premuzic, 2005; Laidra, Pullman & Allik, 2007). The reason intelligence may lose its predictive validity over time has been associated with a restriction in its range among university students (Chamorro-Premuzic & Furnham, 2006; Furnham, 2003). For instance a relatively small percentage of the population attends university with numbers reducing yearly. According to statistics published by UCAS (2012) the number of applicants reduced from 583,546 in 2011 to 540,073 in 2012; that's a reduction of 8.7% overall. Such university entrants have reached a higher level of education and intelligence than the general population (Farsides & Woodfield, 2003), thus intelligence has shown to be less important in relation to predictive validity at this stage. Early research including a longitudinal study (40 years) found that intelligence had little relation to life success (Snarey & Vaillant, 1985); other research reports that intelligence explains limited variance in academic performance (4% to 25%) leaving significant variance to be explained by other variables (Derksen, Kramer & Katzko, 2002). Craggs, (2005) and O'Conner and Paunonen (2007) express that intelligence is not a good predictor of academic performance at tertiary level. However, intelligence has shown to be predictive of job performance for those who have not attended university (Camara & Echternacht, 2000; Higgins, Peterson, Pihl & Lee, 2007; Lounsbury, Sunstrom, Loveland & Gibson, 2003; Strenze, 2007) suggesting that its discriminatory function is more likely to be maximised in non-university samples.

Whilst research demonstrates that intelligence has a strong relationship with academic performance above and beyond previous performance (Busato et al., 2000; O'Connor & Little, 2003; Petrides & Furnham, 2001) and studies have confirmed the predictive validity of both intelligence tests and previous grades (Petrides, Frederickson & Furnham, 2004; Song et al., 2010), this does not however, account for the whole variance. This indicates that intelligence and previous academic performance provide insufficient explanations for academic achievement. Moreover, Intelligence is already implicit in academic performance as observed by Gagné and Peré, (2001) who asserted that performance is a combination of ability and effort. Although there may be a consensus that grades are the best predictor of

subsequent grades (Martin, Montgomery, & Saphian, 2006; Rolfus & Ackerman, 1999), it should not be forgotten that previous grades also contain the influence and impact of personality and effort, along with ability (Conard, 2006). This important fact is in danger of being overlooked in studies that control for previous performance. Ackerman, Chomorro-Premuzic, and Furnham (2011) have summarised that although intelligence indicated maximal performance, personality is reflective of typical performance, and both are contained within past and present grades. In effect when researchers control for previous performance they may be testing if personality has an increasing impact over time.

The critical role of personality in academic achievement

Given the limitations identified in previous attainment and intelligence in the prediction of academic achievement; there has been a burgeoning interest in the role of personality and its impact upon academic grades (Chamorro-Premuzic, Harlaar, Greven & Plomin, 2010). As established, although studies have confirmed the predictive validity of achievement measures such as intelligence tests and previous grades (Petrides, Frederickson & Furnham, 2004; Song et al., 2010), such measures are not sufficient at tertiary level, additionally where they do contribute they do not account for the whole variance in predicting academic achievement, therefore leaving other aspects worthy of investigation. Non-cognitive factors such as certain personality traits have also been shown to predict academic performance consistently (Laidra, Pullmann & Allik, 2007). Of the concepts investigated in this research, personality measured by the Five Factor Model has been studied most extensively. The Five Factor Model consists of five personality variables that capture a whole range of individual differences (Costa & McCrae, 1992; McCrae, Costa & Piedmont, 1993). With the acronym (OCEAN) these are Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (also known as Emotional Stability) and aspects (namely Conscientiousness) have shown incremental validity in academic performance beyond intelligence and previous performance (Di Fabio & Busoni, 2007; Di Fabio & Palazzeschi, 2009; Furnham, Chamorro-Premuzic & McDougall, 2003; Furnham & Chamorro-Premuzic, 2004; Lounsbury et al., 2003). Whilst previous studies have provided evidence that Personality has some validity in performance, the findings have been flawed by inconsistencies and methodological limitations. One such limitation has been identified as the varying criteria used to measure academic performance. These vary widely from end of year assessments to presentation grades, module specific grades, coursework specific grades, exam specific grades and overall degree classification or

Grade Point Average (Busato et al., 2000; Farsides & Woodfield, 2003). It is plausible that personality may predict some academic outcomes but not others and particular aspects of personality are reflected in certain types of assessment only. For instance, Conscientiousness might be expected to contribute to all exams, whereas Extraversion may only contribute to presentation success or assessments that involve teamwork.

In addition to broad assessment of personality, analysis at item level will be employed in chapter one and from this it will be determined whether this is a useful approach to take. Pajares (1996) argued that broad-based measures may lack assessment in crucial indices relating to performance. It is thought that numerous items may be superfluous to the purpose of assessment and that items that are indicative of performance may be missed or disguised within a large pool of items; this is not surprising given that the Five Factor Model was not constructed to predict academic performance (Ackerman et al., 2011). To this end analysis at item level will be considered using both a 100-item and a 50-item version of the Five Factor Model, to determine which is a more efficient indicator of academic performance. Whilst analysis at item level is not typically reported in the empirical literature and may not be welcome by journals because of the extensive and intensive detail required for a short empirical paper, meta-analyses (e.g., Poropat, 2009; Richardson et al., 2012) have tended ostensibly to disregard or relegate the predictive validity of three or four of the five factors. This study will test the underlying content that may be functional in the process of performance but may not be traceable as a direct effect in a broad factor approach. Academic performance reflects both ability and effort and personality-related measures tap the processes and pathways that lead to the end product of performance. Although this is widely recognised most studies (e.g., Poropat, 2009) have been restricted to examinations, broad personality factors and Grade Point Average at the end of a study programme. Chapter 1 extends previous findings by examining the Five Factor Model at the broad and item levels; this will explore if predictive validity is subsumed under broad, general traits. Further this chapter uses a micro approach to analysing assessment association by breaking down Grade Point Average into specific modules, rather than one macro-performance indicator at the end of the student's journey.

Personality is considered within the framework of trait theory, which postulates a common underlying source lies beneath related behaviours that are consistent across time and situations (Pervin, 2003). A trait is defined as a predisposition that predicts what an individual will do in a particular situation (Ryckman, Libby & Ven den Borne et al., 1997).

Apart from its predictive role in educational attainment, personality has a much wider remit because it identifies the behavioural processes that signal the pathway to achievement, and highlights the personal and interpersonal qualities that enhance employability that are invaluable beyond graduation (Yorke & Knight, 2006; 2006a).

The assessment of emotional intelligence in relation to academic performance.

Alongside the personality-related measures, emotional intelligence has emerged as a prominent construct in education research (Mayer et al., 2004). The relationship of academic performance with emotional intelligence however is contentious with mixed evidence and inconclusive findings (Petrides, Frederickson & Furnham, 2001; Extremera & Berrocal, 2005; Downey et al., 2008). Individuals with higher emotional intelligence are possibly better at coping with pressurised situations such as exams (Mayer et al., 2004; Carr, 2009). According to Parker (2006) emotional intelligence relates to drop out and retention rates in university and therefore emotional intelligence is implicated in academic completion. It also relates to the broader student experience (Brackett, 2011) including adjustment and adaptation to university life (Bar-On, 2000), enjoyment of the student experience which is implicated in wellbeing (Austin, Saklofske & Egan, 2005) and in preparation for employability (Yorke & Knight, 2006), a skill set now valued in higher education. Consideration of the aspects that affect student life and student academic performance holistically will ensure that nothing is viewed in isolation. Further, although recent neurological research has shown a clear distinction between emotional intelligence and intelligence (Goleman, 2001) whether an individual's perception of their emotional intelligence is different from their actual emotional intelligence ability is largely unknown. Brackett and Mayer, (2003) found only a weak association between measures, particularly ability-based and self-report suggesting that perceptions of ability differ from actual ability. In accordance with the preponderance of reported research in this domain the trait measure of emotional intelligence will be employed in the current research.

Chapter 3 will focus on emotional intelligence and its incremental association with academic performance. As the literature illustrates, emotional intelligence is a relatively new concept and it is still evolving, although it has demonstrated adequate empirical robustness through various meta-analyses (Mayer, Roberts, & Barsade, 2008). There are various measures of emotional intelligence including trait measures and ability measures. The self-reports to be used in this study include the Trait Emotional Intelligence

Questionnaire (Petrides & Furnham, 2006), the Trait Meta Mood Scale (Salovey et al., 1995), the Assessing Emotions Scale (Schutte et al., 1998) and the Emotional Self-efficacy Scale (Kirk et al., 2008). A unique aspect of this study will be to analyse the configuration of the constructs and to test the uniqueness and overlap between them, this has not been fully considered in previous literature but has been highlighted as being an important possibility (Brackett, 2011). There are inconsistencies in the findings for the association between emotional intelligence and academic performance, combining emotional intelligence measures will determine to some extent whether there are inconsistencies between measures and whether this accounts for the mixed findings. Further, in this research normed patterns on means and standard deviations will be tested using the first cohort as the reference point to explore invariance on these indicators of central tendency and dispersion; it is envisaged this should provide a good demonstration of the validity of the measures.

Proximal indicators of academic performance

Personality and emotional intelligence are considered to be distal, which may affect how they impact upon academic performance (Bidjerano & Dai, 2007). Recent researchers are calling for more work with proximal indicators of academic achievement (Caprara et al., 2011). Such constructs would include Academic Self-efficacy and Test Anxiety. The role of personality in academic performance is beyond dispute, and there is good evidence to suggest that emotional intelligence is crucial to performance also; this will be explored in chapter 3. However, there is call for studies to analyse proximal constructs in relation to academic performance by measuring and comparing direct, indirect and total effects through mediation and path analysis. Chapter 2 will do this using a combination of positive and negative measures. A general self-efficacy construct is considered in addition to an academic self-efficacy construct to determine whether general or academic efficacy is a better predictor when measured with indices of academic performance. Chapter 2 explores this association and, as suggested in recent literature, develops path models that address the association between self-efficacy and test anxiety in relation to academic performance and their combined and predictive validity. Considering the two concepts together, the literature indicates individuals with lower self-efficacy are more likely to experience depression and anxiety; particularly they may be more prone to anxiety when they are in a situation where performing well is important to them, such as an exam (Bandura, 1986; Bandura, 2012; Linnenbrink-Garcia & Pintrich, 2003; Usher & Pajares, 2009). Individuals

with low self-efficacy believe they do not have the skills to perform well and so their test anxiety could be increased (Cassady & Johnson, 2004). It is suggested that self-efficacy helps individuals to overcome negative thought patterns and emotional reactions (Phan, 2012). Hassanzadah, Ebrahimi & Mahdinejad (2012) suggest having positive self-efficacy beliefs may lessen the effects of test anxiety although they do not explore these relations; the current research attempts to bridge this gap.

Self-efficacy is a positive construct addressed within the theoretical framework of Social Cognitive Theory (Bandura, 1977). The construct encapsulates the sense of control one feels over their ability to achieve; furthermore this belief can grow and develop depending upon an individual's prior experiences (Sansgiry & Sail, 2006). Bandura (2006; 2008) asserts that one's belief in their ability to control their actions motivates them to act in ways that will ensure their efforts will be successful. Therefore, self-efficacy is the interplay between personal, behavioural and environmental determinants that enable individuals to have control of their lives.

In assessing the impact of individual differences on performance it is important to include not only positive constructs such as self-efficacy but also to consider active negative constructs; negative attitudes and actions are an important aspect of individual experience and should be assessed in addition to positive attributes (e.g., Wolfe & Johnson, 1995). To this end test anxiety has been implemented in the assessment of academic performance and is considered within a behavioural and psychodynamic framework. It belongs within a behavioural model in the sense that aspects of emotionality can be observed; however the test anxiety construct also contains cognitive features (Cassady & Johnson, 2004). Test anxiety fits within a psychodynamic framework as it is a negative predictor of performance. Researchers have debated whether test anxiety is a state or a trait; even if findings assert that it is a state it can be argued that for students it is recurring due to the nature of assessment and therefore requires attention from researchers. Both the cognitive and emotionality factors will be assessed independently in order to ascertain if each account for significant variance in the prediction of academic performance.

Test anxiety is an important issue in education and can negatively impact academic performance and the overall quality of the student experience (Putwain et al., 2010; DeCaro et al., 2010). Students experience anxiety during an exam and often in the period leading up to this, anxiety is also experienced when there is an outstanding deadline for

coursework as shown by avoidance behaviours (McIlroy & Bunting, 2000). The perception of tests as challenging or threatening can determine whether an individual experiences test anxiety. When test anxiety is experienced students may set low goals for themselves whilst developing avoidance behaviours deeming them less likely to adopt useful test preparation strategies or coping techniques; it is anticipated that self-efficacy may provide a buffer against such maladaptive approaches. The evidence leans to the assessment of test anxiety and self-efficacy together rather than in isolation; this is the approach adopted in chapter 2, especially given that self-efficacy may be the key regulatory variable impacting on anxiety (Bandura, 1997).

The utility of assessing emotional intelligence in relation to wellbeing and issues with wellbeing and academic performance measurement.

With universities being interested in developing their students as all round academically and socially capable individuals (Ross, Powell & Elias, 2002), there is not only a need to improve students' repertoire of behaviours, beliefs, motivations and emotions, it is also necessary to consider their wellbeing and quality of life. As an extension of chapter 3 that considers emotional intelligence in relation to academic achievement, chapter 4 assesses the relationship between emotional intelligence and wellbeing. Emotional intelligence has been analysed in relation to wellbeing and quality of life showing a promising bank of results; however numerous methodological issues prompt the need for further analysis. James, Bore and Zito (2012) found emotional intelligence was not predictive of wellbeing beyond the Emotional Stability factor; critics have argued that emotional intelligence may be redundant when used in combination with personality to measure outcome variables (Brody, 2004; Landy, 2005; Schulte, Ree & Carretta, 2004). Despite this, limited research relating to wellbeing and quality of life has controlled for the effects of personality (Zeidner et al., 2010); of those that have, personality has been considered in relation to limited wellbeing outcomes. Within the context of positive psychology this study employs a number of positive measures which are used to determine the participants' perceived level of wellbeing and quality of life; also a number of affective (negative) constructs are incorporated within this study so that a full range of wellbeing variables are evaluated.

As a subsection of chapter 4, wellbeing will also be considered in relation to academic performance; whilst some association is anticipated, the outcomes are expected to be limited as there may be some issues in the measurement of wellbeing and academic

performance; measures are less likely to capture predictive validity if they are not tailored to the outcome being assessed (McIlroy et al., 2000). Nonetheless, given the paucity of research in this area it is considered important to the contribution of knowledge base that this is explored.

Therefore, chapter 4 will concentrate on emotional intelligence and wellbeing in association with academic performance; this takes account of the whole student experience, rather than academic achievement in isolation. It is claimed that most students who drop out of study programmes do not do so for academic reasons, and emotional intelligence scores have been found to relate to student retention (Parker et al., 2006). As the remit of this study is to highlight the overall needs of students in addition to academic achievement, considering their wellbeing and overall quality of life was deemed most appropriate and important. Satisfaction with life has shown to improve overall student experience and increase performance level and intrapersonal aspects of emotional intelligence such as mood regulation have shown to be associated with higher levels of life satisfaction and lower levels of depression, leading to improved academic performance (Austin et al., 2004). The outcome measures that will be the focus of this aspect of the study will be on factors such as satisfaction with life and wellbeing in addition to academic performance. To this end chapter 4 will examine the combined and unique effects of emotional intelligence, personality and wellbeing. Again, responses will be tested across cohorts to ascertain if there is invariance across the levels of the programme. Data for this study will be collected from each cohort of students as with the two previous studies.

The importance of sleep as a factor of wellbeing

As an aspect of wellbeing, sleep is considered vital, in addition sleep is thought to impact academic performance (e.g., Curcio, Ferrara & Gennaro, 2006; Galambos, Howard & Maggs 2010). A subsample of students were given an Actiwatch to wear continuously for a period of 7 days during an examination period and during a period of low or no workload. The pattern of activity and stress level will be compared between these two time points. This time period has been selected to allow an assessment of regular, average sleep per night and cumulative sleep debt across the period. Participants will also complete a sleep diary each morning on waking, along with the waking mood scales and the well-validated Perceived Sleep Quality Index (PSQI). It has been recognised that sleep regulation is an important aspect of the undergraduate experience, with likely impact on both wellbeing

and academic achievement (e.g., Eliasson et al., 2010; Gaultney, 2010). Research has also shown that before an exam students may engage in a cramming exercise, whereby they are awake for all or part of the night; implications of a night without sleep could be serious, affecting sleep-wake cycles and ultimately mood, wellbeing and academic performance (Thacher, 2008). Chapter 5 will assess these associations using a wide array of individual difference measure taken from across the study as all have shown some association with sleep; however previous research has considered the associations in isolation; chapter 5 brings together a number of schools of thought in determining the detrimental impact of poor sleep. As stated, it is a commonly held belief that students follow an erratic and unpredictable pattern of sleep whilst at university, a belief supported by objectively derived data (Eliasson et al, 2010). The impact of irregular routine and acute periods of sleep deprivation in terms of cognitive performance, attention, ability to focus, and sensitivity to exam situations is largely unknown, with the bulk of the published research to date focusing on the experimental manipulation of sleep behaviours in an artificial environment. This research provides the opportunity to explore these important issues in an ecologically valid applied setting, as participants follow their normal daily behaviour patterns in their own home. Given the intensity and resource requirements of this study, it necessitated using a small sample of students who were willing and available to participate.

The supplementary contribution of cross cohort research

As an additional aspect to the main aims of the thesis, the current research examines the response patterns across UK students on their personality profiles and their level of emotional intelligence. Chapter 1 explores their personality profiles and the cohorts are revisited again in chapter 3, which assesses their mean emotional intelligence scores. The groups are matched by age (mean 20.26), subject type (Psychology) and level of study (5) at university. This data is pre-existing and is used to assess comparative norms only. There is a paucity of cross cohort data and so there is benefit in establishing norms which will validate consistency of measurement and inform tailored intervention programmes where necessary.

Synopsis of study aims and contribution to knowledge

In light of the limitations highlighted in relation to previous grades and intelligence at tertiary level; the current study will not employ such measures in the prediction of academic performance. The main aim is to determine the impact of individual differences

in association with academic performance, student experience, wellbeing and quality of life. The pattern of study is systematic over the three years of a degree; university students are required to glean the most relevant information from lectures, tutorials and home study. The level of independence required increases from level 4 to 6 and students are encouraged to read more widely moving away from basic texts in their first level of degree study to advanced articles that concentrate on specific outcomes in their second and third years of study. In accordance, study habits are likely to change from level 4 to level 6 so it is expected that there will be a varied pattern of associations between individual difference indicators and academic outcomes across the 3 years of study. Students' personalities to which they are predisposed, their attitudes, beliefs, behaviours, anxieties, sleep patterns and wellbeing are assessed in relation to academic performance and overall quality of life. To summarise the aims in terms of overall contribution to knowledge, these attributes will be assessed by a combination of positive and negative constructs within various psychological orientations. This study is designed and constructed within multiple theoretical frameworks including social cognitive theory (Bandura, 1986) psychodynamic, behavioural, trait personality and emotional trait theories and within well-developed constructs such as positive psychology and wellbeing. Within the framework of theory the empirical aspects of this thesis are developed from meta-analyses and robust constructs that have evolved over numerous years as well as more recent constructs within positive psychology. The goal of this robust and rigorous approach has been to construct work that is relevant in the applied setting and that has pedagogical value. This thesis seeks to inform the philosophy of teaching in terms of helping educators to see the non-intellective, non-ability individual difference variables. From the perspective of students the focus is on motivational variables, self-regulating variables and cognitive process variables such as self-beliefs and self-concepts. Each perspective is interwoven into the overall application of the thesis and this approach utilises the rich diversity of factors that contribute to academic performance and student quality of life.

Successful academic performance requires a combination of ability and effort, taking into consideration personality related variables (Conard, 2006; Gagné & Peré, 2001). These encapsulate the initiative and independence required at tertiary level of study. However, the predictive map relating personality to academic achievement is complex and chequered. It is evident from the literature that there are still considerable gaps in knowledge; chapter 1 explores these breaches. Predominantly research comprises macro-

analyses of the broad domains of personality traits and final Grade Points Average, clear limitations identified by Paunonen and Ashton (2001) and more recently Poropat (2009). These meta-analyses and reviews have tended to bring independent research together, however this has not been adequately integrated into one particular study. In light of this, an analysis of items in personality rather than broad domains will be explored through chapter 1, in order to establish stronger predictive validity.

Chapter 2 brings together the well-validated positive and negative constructs of self-efficacy and test anxiety in the prediction of academic achievement. Whilst valid predictors in themselves self-efficacy and test-anxiety were combined to explore whether self-efficacy may provide some protection against anxiety. Further, whilst test anxiety is a specific academic construct, self-efficacy includes both an academically specific measure and a more general measure. Self-efficacy has been widely researched and findings suggest that students with high self-efficacy beliefs perform better academically than those with low self-efficacy perceptions (Jackson, 2002; Iskender, 2009; Phan 2010). As there are various measures of self-efficacy however, there is on-going debate about whether specific or general measures are optimal predictors of academic performance (Caprara, Vecchione, & Alessandri et al., 2011; Pajares, 1996). Therefore, chapter 2 will also investigate the factor structure and comparative predictive validity of self-efficacy and whether the specific measure is subsumed or redundant alongside the general measure.

In an attempt to tackle the inconsistencies in previous literature, chapter 3 brings together an array of well-known and well validated emotional intelligence measures and assesses these in relation to a wealth of academic performance outcomes. There has been much suggestion that some measures of emotional intelligence relate to performance and some do not, this study aims to demonstrate consistency across some of the better-known inventories, thus minimising the risk of bias that might be associated with a single measure (Warwick & Nettelback, 2004).

Chapter 4 extends the emotional intelligence assessment and considers it in relation to student wellbeing and quality of life. Limited research into the emotional intelligence/wellbeing relationship has controlled for the effects of personality (Zeidner et al., 2010); of those that have, the wellbeing measures used have been limited wellbeing outcomes including un-validated questionnaires, only one or two wellbeing variables or unspecified variables. Chapter 4 attempts to overcome these limitations by employing a

number of positive and negative wellbeing and quality of life measures. Further, wellbeing is also considered in relation to academic achievement; there is a paucity of research into the impact of mental wellbeing on academic performance. Academic stressors and difficulty coping have been shown to have a negative impact on grades (e.g., Akgun & Ciarrochi, 2003; Austin et al., 2010); however, other wellbeing variables such as positive and negative affect, depression and anxiety and health self-efficacy have been less studied in relation to academic achievement and where they have, often they have been considered in isolation from one another. This study aims to extend previous research by including a number of well-validated constructs in addition to a variety of academic outcomes.

Most studies rely on self-report measures to assess the quantity and quality of sleep. They also provide little information on how academic performance is assessed and do not fully consider confounding variables. Therefore it is difficult to draw definitive conclusions about the relationship between sleep and other variables such as academic performance and wellbeing. As recommended by Dewald et al., (2010) and Galambos et al., (2010), chapter 5 will explore sleep using Actigraphy in addition to self-reported sleep measures. Finally, chapter 5 is unique in that it brings together a wealth of measures including self-efficacy, test anxiety, emotional intelligence and wellbeing (Taylor et al., 2011) and, as suggested by Gray and Watson (2002), all three measures of sleep (quantity, quality and schedule) have been included.

Overall, different outcomes can depend on how academic performance is operationalised (Agnoli, et al., 2012; Jaeger & Eagan, 2007). In contributing to existing research, each chapter employs a diversity of academic performance outcome measures, a factor that has been often overlooked in previous research. Indices of academic performance will include module averages, level averages, aspects of specific modules i.e., coursework/exam grades and the overarching indicator of academic performance, grade point average or overall award mark. Further, this will be considered for each participant across 2 cohorts (levels, 4 & 5) and considered in relation to their grades across their entire time at university. This will allow identification of vulnerable points across university and identify if the pattern changes or remains stable across levels of study in relation to grade outcome. Consideration of the process (the student experience and how they achieve their grade) rather than simply the end product will enable a comprehensive investigation into the individual differences that contribute to successful performance.

Further, whilst meta-analyses and reviews have brought together a full range of independent studies, this study aims to synchronise a diverse variety of aspects including prediction of performance; this involves clear identification of behavioural and attitudinal clusters of predictors which is an important aspect of scientific method (Popper, 2002). Prevention (for instance how emotional intelligence might protect against drop out), preparation for the world of work, precision (mining down into the items of personality and looking at specific grades for specific modules in addition to Grade Point Average) and personal aspects (development of the qualities that support optimal performance and wellbeing) will also be considered. Further, a panoramic view will be taken giving consideration to a fuller range of traits, cognitions and emotions. Moreover, responses will be tested across cohorts to ascertain if there is invariance across the levels of the programme.

With universities being interested in developing their students as all round academically and socially capable individuals, this study could be used to inform educators about the effects of distal and proximal indicators of academic performance. Further, to highlight the need to improve students' repertoire of behaviours, beliefs, motivations and emotions, this in turn could improve their academic performance. The concepts also extend to student retention, employability and overall student experience (York & Knight, 2006; Elias, 2009). In addition to academic performance students attending university are interested in their future career pathways and the psychological constructs selected, particularly self-efficacy, emotional intelligence and the wellbeing measures have shown to be associated with improved career prospects and career performance (Rode et al., 2008). Further, developing these areas alongside cognitive and academic skills is proposed to be vital to students' personal, educational and career related progress. This project will address these issues and examine the outcomes longitudinally, through archival academic performance data. A meta-analysis by Poropat (2009) conducted a longitudinal analysis of emotional intelligence and Grade Point Average in secondary education but to date emotional intelligence and wellbeing does not appear to have been analysed longitudinally in tertiary education. Meta-analyses and reviews have brought together a full range of independent studies, however this study aims to synchronise a diverse variety of aspects including prediction of performance; this involves clear identification of behavioural and attitudinal clusters of predictors which is an important aspect of scientific method (Popper, 2002). Prevention (for instance how emotional intelligence might protect against drop out),

preparation for the world of work, precision (mining down into the items of personality and looking at specific grades for specific modules in addition to Grade Point Average) and personal aspects (development of the qualities that support optimal academic performance and wellbeing) will also be considered. Further, a panoramic view will be taken giving consideration to a fuller range of traits, cognitions and emotions.

Strategy for analyses

To examine the quality of the data, all measures were tested by a full range of descriptive statistics to explore central tendency and dispersion. These include means, standard deviations, skewness and kurtosis. For some aspects of the analysis the descriptive statistics were used for normed references where the first occurrence of the data was used as the primary reference point. However, given that a diversity of measures were used, these were interpreted with reference to the metric of each individual scale.

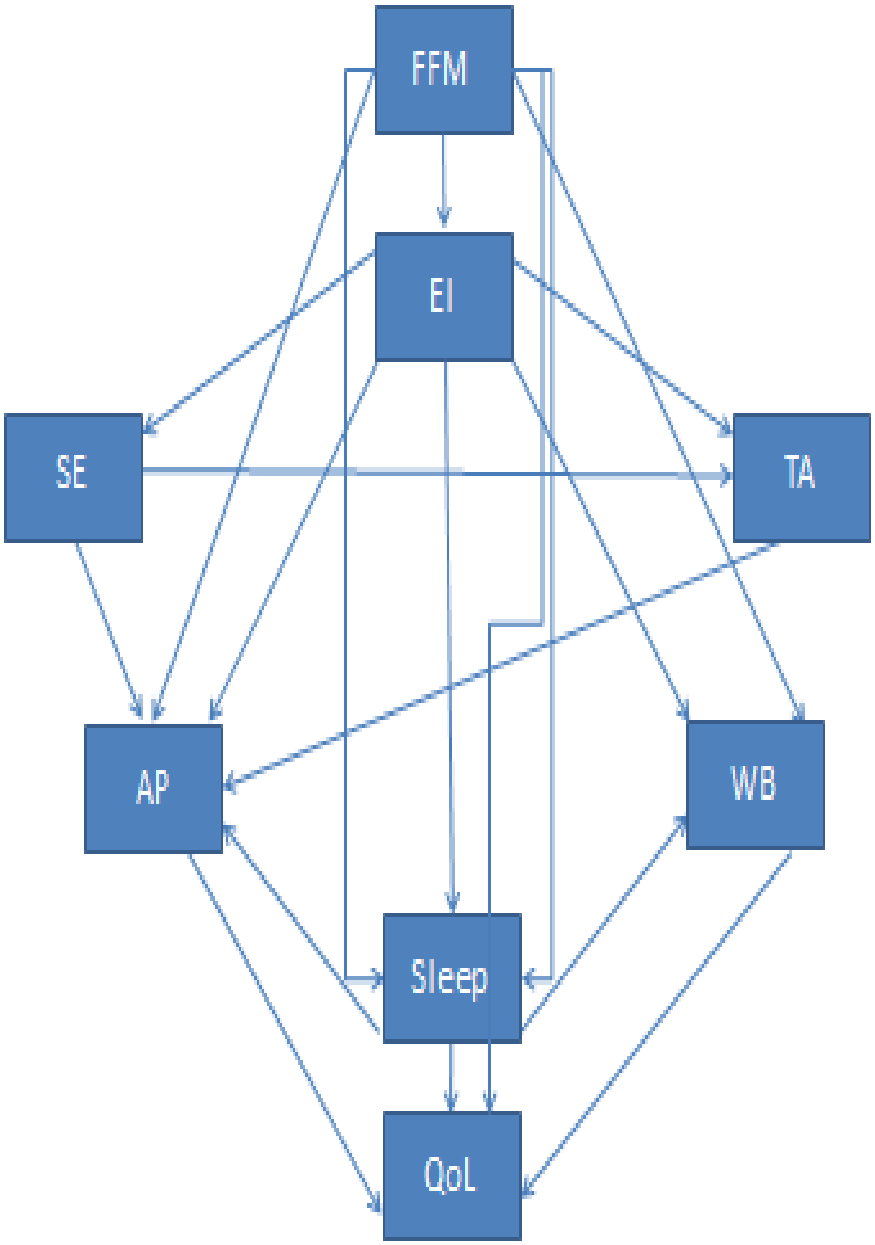
Primary hypotheses testing began with zero order correlations which were used to test the association between pairs of variables although these are generally presented as clusters within a matrix. Significant associations were hypothesised in both the positive and negative directions, but all results interpreted at the 0.05 level should be interpreted for caution to allow for type 1 errors in the case of multiple tests.

In order to test the weighting of the variables implicated in significant bivariate associations, a series of multivariate approaches were used as multiple and hierarchical regression, path models, measurement models and structural models. These provide beta weights through regression, effect sizes (R^2), incremental variance, factor loadings and indirect effects to test constructs both independently and in association with each other.

The statistical models adopted were informed by theoretical frameworks and empirical findings. For example distal predictors are postulated as such because they were seen as traits (deemed to come from genetics and early learning), whereas proximal concepts are seen both to be developed by later learning and experience and because of their more direct relationship with targeted outcomes.

Throughout this thesis a number of abbreviations, acronyms and specific terms are used. Consequently, a glossary is provided at the end of this thesis to specify what these refer to in the present work.

CONCEPTUAL MODEL



Chapter 1

The impact of personality on academic performance and student experience

Abstract

Previous research has considered the impact of personality on academic performance (e.g., Paunonen & Ashton, 2001; Poropat 2009; however, despite a plethora of studies, there are inherent inconsistencies in the literature due to methodological limitations; one reason these may arise is the differing criteria used for examining academic success (Busato et al., 2000; Farsides & Woodfield, 2003). The current research attempts to overcome such limitations by employing a range of academic performance measures. A quantitative, cross-sectional and archival longitudinal design using self-report measures was conducted with N =404 (Current UK) and 970 (cross-cohort) participants. The cohort self-report measures were aligned with recent academic performance indicators including level averages, yearly averages, specific coursework grades, exam grades and module averages. Results showed strong correlations between coursework and exams for all subjects. Further, it was evident that analysis at item level is useful as it shows some connection between personality and academic performance for all aspects of personality; however some of these potential relationships are masked through analysis of only the broad domains. Results also showed mean similarities between cohorts on all factors. Finally three multiple regression analyses were conducted, and all three models were statistically significant as shown by the F-values ($p < .01$). Conscientiousness and Emotional Stability accounted for 6, 5, and 4% of the variance on academic performance for Research Methods, Biological, Cognitive and Developmental Psychology and Social Psychology and Individual Differences respectively.

1.1 Introduction

Academic performance is a prominent topic of concern for policy makers and educationalists globally (Petrides, 2011; Poropat, 2009); particularly as academic performance relates strongly to subsequent career success (Kanfer, Wolfe, Kantrowitz, & Ackerman, 2010; Strenze, 2007). Traditionally prior educational attainment has been used as an indicator of subsequent performance (e.g., Farsides & Woodfield, 2003). Intelligence has also been considered an important predictor of academic grades (e.g., Busato, Prins, Elshout, & Hamaker, 2000; Furnham & Chamorro-Premuzic, 2005; Laidra Pullman &

Allik, 2007; Rhode, 2007; Strenze, 2007). In recent years however, there has been a marked increase in researchers' interest in self-perceived abilities (Chamorro-Premuzic, Harlaar, Greven & Plomin, 2010) relating to academic performance. Such research focuses its efforts particularly on personality variables (Paunonen & Ashton, 2001). Personality traits are stable characteristics that explain an individual's disposition to behaviour, cognitions and emotions (Hogan, Hogan & Roberts, 1996). The most widely used and empirically sound inventory is the Big 5 or the Five Factor Model. The Five Factor Model consists of five personality variables that capture a whole range of individual differences (Costa & McCrae, 1992; McCrae, Costa & Piedmont, 1993), with the acronym (OCEAN), these are Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism (also known as Emotional Stability).

It has been suggested that personality and academic performance may be associated due to common links with intelligence (Chamorro-Premuzic & Furnham, 2008); however this relationship is complex for instance the correlation between intelligence and extraversion is thought to vary with age and research methodology (Wolf & Ackerman, 2005); A meta-analysis by Poropat (2009) showed that controlling for intelligence had negligible effects on the validity of the Five Factor Model therefore rendering the argument that the two are linked, void. Kappe and Van der Flier, (2012) reported that intelligence was not related to any personality variables. Further, Conscientiousness has shown to correlate negatively with intelligence (Poropat, 2009), indeed students with low ability have demonstrated the use of Conscientiousness as a compensatory mechanism for lower intelligence (Ackerman, Chomorro-Premuzic & Furnham 2011). Moreover, measures of intelligence were specifically designed to predict academic performance; the Five Factor Model and other personality constructs were not (Poropat, 2009; Ackerman et al., 2011). Nonetheless non-cognitive factors such as certain personality traits have been shown to predict academic performance consistently (Laidra, Pullmann & Allik, 2007; Richardson, Abraham & Bond, 2012). They have also shown predictive validity in job performance above and beyond intelligence and academic grades (Kanfer, Wolf, Kantrowitz & Ackerman, 2010).

Personality measured by the Five Factor Model has been studied most extensively and has demonstrated incremental validity in academic performance beyond intelligence and previous performance (Furnham, Chamorro-Premuzic & McDougall, 2003; Kobrin et al., 2008; Martin, Montgomery & Saphian, 2006). At tertiary level of education when intelligence is less pivotal, personality is deemed to play a vital role in academic success.

Where ability has shown to predict what an individual *can* do, personality is thought to predict what an individual *will* do (Furnham & Chamorro-Premuzic, 2004). Moreover, although ability may represent a person's maximal performance, personality is likely to represent their typical performance (Chomorro-Premuzic & Furnham, 2003).

Personality

Conscientiousness

Of the personality factors, Conscientiousness has exhibited the strongest and most consistent associations with academic performance across all levels of education (Ashton, 2001; Goldberg et al., 2006; Kapp & Van der Flier, 2010; McIlroy and Bunting, 2002; Paunonen & Trapmann et al, 2007; Poropat, 2009); this applies cross-culturally (Wagerman & Funder, 2007) and is particularly pertinent in tertiary education (Conard, 2006; Di Fabio & Busoni, 2007; Petrides, 2005). Conscientiousness has demonstrated incremental validity in grade point average above and beyond previous attainment (Richardson & Abraham, 2009) and Conscientiousness has shown to be distinct from intelligence as indicated by its negative correlation (Chamorro-Premuzic & Furnham, 2006; Higgins et al., 2007; Poropat, 2009). However some research has found Conscientiousness to account for variance over and above intelligence (Bratko et al., 2006) sometimes adding as much to the prediction of degree success as both previous performance and intelligence (Poropat, 2009). Kappe and Van der Flier (2010) found Conscientiousness to explain five times the variance in Grade Point Average than intelligence, although the results of this study may be exceptionally higher than that of typical findings. There are of course studies that have found no correlation or negligible associations (Farsides & Woodfield, 2003). Cucina and Vasilopoulos (2005) established a U-shaped distribution indicating that individuals who were highly conscientious and those low on conscientiousness performed less well than those who were moderate to high. It could be that individuals who are too conscientious may take on too much work and so hinder their performance; such students might also engage in more extracurricular activities. Richardson, Abraham and Bond (2012) report the highest correlation for Conscientiousness was .19 but this had a 95 percent confidence interval, illustrating that Conscientiousness is important to academic performance even when the correlations are relatively low (e.g., .01 to .21). Richardson et al., argue that even small effects are very important when they are demonstrable population effects, as is the case here.

Conscientiousness has an explicit behavioural component in addition to cognitive factors and its relevance is intuitive given that a moderate to highly conscientious person is likely to be reliable, have a strong sense of duty and attend to tasks straight away. Such qualities have been shown to be useful determinants in academic success (Eccles & Wigfield, 2002; Van Der Zee, Atsma, & Brodbeck, 2000). Duff, Boyle, Dunleavy, and Ferguson (2004) found learning orientation to be related to personality and previous educational experience, specifically that Conscientiousness was linked to strategic study including a desire to manage time and organise studies to maximise opportunities for success. In a pithy summary statement, Di Giunta, Alessandri, and Gerbino et al., (2013) concluded that Conscientiousness represents a "methodic and analytical approach to study'' (pp. 102). Although Conscientiousness is a trait covering behavioural consistency over time and across situations, it is also deemed to encapsulate the dynamic component of motivation (Richardson & Abraham, 2009).

Openness to Experience

Within the Five Factor Model factors, Openness to Experience correlates most highly with intelligence (Burton & Nelson, 2006; Chamorro-Premuzic & Furnham, 2003; Harris, Vernon & Jang, 2005; Lounsbury et al., 2005; Poropat, 2009). From their meta-analysis, Trapmann et al., (2007) found Openness to be the second highest predictor of academic performance after Conscientiousness. Researchers might suggest that this is understandable given that students with high levels of Openness have a propensity to participate in classroom activities, are open to new ideas and experiences, are creative and prone to critical thinking (Bidjerano & Dai, 2007; Burton & Sztaroszta, 2007; O'Connor & Paunonen, 2007). Lounsbury et al., (2003; 2005) found Openness to be predictive of academic performance over and above general intelligence; Openness is also associated with a deep approach to learning (Duff et al., 2004). However, findings demonstrate the association of Openness with academic performance is inconclusive and many studies have failed to find significance (Conard, 2006; Gray & Watson, 2002). Despite being highly correlated with intelligence, Openness does not translate into being the highest correlation with academic performance (Poropat, 2009). Most studies that have found significance have reported weak correlations possibly arising from methodological problems for instance not controlling for moderating variables (O'Connor & Paunonen, 2007; Poropat, 2009). This might suggest that the relationship between Openness and academic performance may only be apparent for specific subjects, particularly those involving

creativity and imagination such as art or music (Rosander et al., 2011). However, it is a good compliment to Conscientiousness given the combination of regularity, rhythm and regulation with imagination, initiative and independence.

Agreeableness

Agreeableness has also elicited varied results with some studies finding a positive correlation with academic performance (Clark & Robertson, 2005; Komarraju et al., 2009). However, Farsides and Woodfield (2003) found that the correlation between Agreeableness and academic performance was wholly mediated by seminar attendance and other findings suggest a negative correlation or no association (Cucina & Vasilopoulos, 2005; Ridgell & Lounsbury, 2004). Overall, the literature suggests that Agreeableness is not a prominent determinant of academic performance. However, Agreeableness relates to factors which are useful for getting along with peers, tutors and colleagues and attending seminars, all of which may contribute to the learning process and ultimately achievement (Lounsbury et al., 2003; 2005). These aspects are not, however, considered to be substantial enough and the effect sizes too low to be generalised (O'Connor & Paunonen, 2007). Despite the inconsistent findings, pro-social personality factors such as Agreeableness are likely to be particularly important to Psychology students and their careers (Lantz, 2011; Sanchez-Ruiz et al., 2010). This is supported by Ackerman et al., (2011) who advocate the impact of personality should not be restricted to academic performance. Ackerman and colleagues introduce the idea of widening the criterion space and recognising that personality refers to typical behaviours outside of the classroom and not solely under maximal performance conditions. Therefore, it is important to recognise the effect of personality in other areas of student life that may be useful for their career path and overall student experience.

Extraversion

The relevance of Extraversion in relation to academic performance is mixed (Busato et al., 2000; Chamorro-Premuzic & Furnham, 2009; Trapmann et al., 2007). Some studies report no association between Extraversion and academic performance (Heaven et al., 2002), others report a positive association (Fruyt & Mervielde, 1996; De Raad & Schouwenburg, 1996) and some a negative association (Busato et al., 2000; Goff & Ackerman, 1992). Rosander, Backstrom and Stenberg, (2011) found Extraversion to be associated with certain subjects (Social Sciences and Sport Psychology) and not others and not with Grade

Point Average. The usefulness of Extraversion as a predictor variable could depend upon cultural aspects or specific course requirements, for example group work. Facets of Extraversion including assertiveness and sociability may not affect academic performance directly in the majority of subjects; however students may excel at work that involves group interaction and find it easier to seek help and socialise with other students, enhancing their overall university experience. They may also assert themselves in communicating with their teachers, thus facilitating the learning process and improving retention rates (Parker et al., 2006; Richardson & Abraham, 2009). Some research has reported that the relationship between Extraversion and academic performance reduces with age and so is less important at tertiary level (Poropat, 2011) as students are less likely to interact with their teachers and more independent work is required (Poropat, 2009). Eysenck (1992) suggests that Extraversion changes from being a positive to a negative predictor of performance as students progress through the stages of education and that a high level of Extraversion may detract from academic commitment. One characteristic Eysenck highlighted was distractability; this may prevent individuals high on Extraversion from expending time and effort on tasks (Bidjerano & Dai, 2007). Moreover, according to Matthews, Zeidner and Roberts (2004) individuals high on Extraversion have demonstrated less ability to engage in reflective problem solving due to early cognitive closure, suggesting Extraversion is not conducive to complex tasks that require attention.

Neuroticism

Finally, the literature on Neuroticism is inconsistent with some researchers reporting no relationship and others negative correlations with academic performance (Poropat, 2009; Ridgell & Lounsbury, 2004). Students with high levels of Neuroticism have exhibited poor critical thinking and conceptual understanding; as such individuals tend to focus on their personal state which hinders higher cognitive functioning (Bidjerano & Dai, 2007). Consistent with this, Van Der Zee, Thijs, and Schakel, (2002) found emotionally stable students performed better academically due to their ability to cope and manage their emotions, responding appropriately to stress and adapting to new challenges. De Raad and Schouwenberg, (1996) suggest that individuals high on Neuroticism are often anxious and focus much of their attention on their emotional state which in turn reduces their attention to academic work ultimately reducing academic performance. Such individuals are also thought to take a surface approach to learning rather than developing a deep understanding of it (Entwistle, 1998). Other evidence however, yields mixed results; this may be because

those high on Neuroticism may anticipate failure and so motivate themselves to avoid it, this may also be dependent upon criterion variables used (De Fruyt & Mervielde, 1996; Norem & Cantor, 1986; Rosander et al., 2011).

Variance in academic performance

Many researchers have concluded that both intelligence and personality should be taken into consideration when examining links to academic performance (Chamorro-Premuzic & Furnham, 2005; Kanfer et al., 2010). This makes sense given that success is often attributed to ability and effort (Gagne & Pere, 2001). In combination personality and Intelligence have shown to account for only 30% of the variance in Grade Point Average at most (Laidra, et al., 2007), however personality has been found to add significant variance. A study by Lounsbury et al., (2003) revealed that Intelligence accounted for 16% of the variance in Grade Point Average and personality accounted for an additional 7%. Farsides and Woodfield (2003) found Intellignce to account for only 4% of the variance in academic performance with Verbal Intelligence being the only significant predictor; personality accounted for a further 5% illustrating that personality may be imperative at tertiary level. These may be at the lower end of the spectrum of the estimated effects of Intelligence on academic performance, but even higher estimates leaves substantial residual variance unexplained (Richardson et al., 2012). In sum, personality is implicated in the processes that lead to the end product of academic performance (Poropat, 2009), and the operational definitions of the Five Factor Model highlight the behavioural mechanisms likely to optimise student performance.

The fact that there is still considerable variance in academic performance that is not accounted for may be because the five personality factors measured in relation to academic performance are very broad. These broad factors (domains) reside at the top of the personality hierarchy and are known to comprise more narrow facets (sub domains) (Paunonen & Ashton, 2001). Each factor contains 5 facets, for instance Conscientiousness encompasses Self-efficacy, Orderliness, Dutifulness, Achievement-Striving, Self-Discipline and Cautiousness. Paunonen and Ashton, (2001) suggest that factors and facets are statistically distinct therefore each may add unique variance to the prediction of behaviour, in this case academic performance. The results of their studies support the use of facets over factors for behaviour prediction. There is some evidence to suggest that facet level personality variables may be better or more useful predictors of academic

performance (Costa & McCrae, 1995; Paunonen & Ashton, 2001). O'Connor and Paunonen (2007) found facets to be stronger predictors of academic performance than factors and Vries, Vries and Born, (2011) found the facets of Conscientiousness to be more predictive than the broad trait across two studies. Poropat (2009) delineates that the use of broad measures is limited and that more detailed analyses may shed light on more refined relationships between personality and academic performance. However, the broad factors are more likely to come into play when the criterion space is widened beyond academic performance (Ackerman et al., 2011). In contrast, Rosander and Backström (2012) used a facet approach and were forced to collapse Grade Point Average into many specific components before detecting small effects which were not consistent across genders. Their findings would be very difficult to replicate and more recent studies have opted for the broad trait approach accompanied by intermediary constructs (Zuffiano et al., 2013; Di Giunta et al., 2013).

It is clear from the literature that there is a necessity for a more detailed investigation into the underlying aspects of personality and their association with academic performance. By considering only broad traits more detailed associations with academic performance may be missed. Further, some domains of the hierarchy are thought to overlap (Costa & McCrae, 1995); focus on the narrow traits will diminish this possibility. Still, as noted by Costa and McCrae, it is important to consider both factors and facets in order to measure both general and specific influences of Personality. However, this research will go a step further and consider analyses at item level. This will help identify which aspects of the Five Factor Model relate directly to performance and which do not. The argument of trait versus facets may come down to careful examination of meta-analyses and whether given findings at facet level extend beyond the reported confidence intervals, and whether these only reflect a trivial advantage. It should be noted that the accumulated evidence from recent meta-analyses has been based on broad factors, and these effect sizes are less likely to be affected by the idiosyncrasies of particular studies. There may not be sufficient evidence to demonstrate that there is real added value from the use of facets.

Academic performance

Despite a plethora of studies on personality and academic performance, there are inherent inconsistencies, and one reason these may arise is the differing criteria used for examining academic success. These vary widely from end of year assessments to presentation grades,

module specific grades, coursework specific grades, exam specific grades and overall degree classification or Grade Point Average (Busato et al., 2000; Farsides & Woodfield, 2003). It is plausible that personality may predict exam success but not overall Grade Point Average (Nguyen, Allen & Fraccastoro, 2005) and that certain factors may predict some criteria but not others, for example Extraversion may predict grades for presentations but not written exam results. Considering which particular aspects of personality predict which criteria will enable a more coherent understanding of the personality – academic performance relationship. The most dominant criterion variable used to measure academic performance is Grade Points Average (Kappe & Van der Flier, 2010; Poropat, 2009). Despite being the most frequently used outcome variable the reliability and validity of Grade Point Average has been brought into question. It is laced with much variability across modules and between coursework and exams (Kappe & Flier, 2010; Lounsbury et al., 2003; Ridgell & Lounsbury, 2004) and this variability is not controlled for. Grade Point Average is a summation of a student's overall grade and there is also the matter of grade inflation and this can reduce comparability between grades and disrupt rank ordering (Poropat, 2009). Simply using Grade Point Average may attenuate the outcome. Further, as Grade Point Average is a summative measure of the outcome of a student's academic performance it provides no indication of the elements that affect individual grades (Garger, Thomas & Jacques, 2010). Therefore Chamorro-Premuzic and Furnham (2003), O'Connor and Paunonen (2007) and Poropat (2009) have suggested using more specific outcome variables than Grade Point Average for instance specific grades. In addition, many studies present Grade Point Average as a given postulate without reference to the inter-correlations between the performance indicators. The present study will test these associations through zero order correlations.

Personality beyond academic performance

In addition to academic performance the development of interpersonal and social skills is now a pertinent issue in higher education, with the aim of enabling students to become academically and socially capable individuals (Elias, 2009). Factors such as Agreeableness and Extraversion highlight these qualities. Emotional Stability informs behaviours such as mood control and regulation, stress management, resilience and perseverance. Therefore, apart from its predictive role in educational attainment, Personality has a much wider remit because it identifies the behavioural processes that signal the pathway to achievement, and highlights the personal and interpersonal qualities that enhance employability and that are

invaluable beyond graduation (Yorke & Knight, 2006; 2006a). This study examines the response patterns to a Personality measure of four groups of students in the UK who are matched by age (mean 20.26), subject type (Psychology) and level of study (5) at university. Heuchert, Parker, Stumf and Myburgh (2000) found that the factorial configuration of the model was invariant across groups although mean factor and facet scores differed. However, because the factor structure was found to be invariant the authors concluded that mean variations may reflect differences in the expression of Personality. Moreover, it is evident that different groups may place greater value on some aspects of personality compared to others.

When personality is investigated within the educational context, it has been suggested that students' personality profiles may predispose them to choose given subjects (Sánchez – Ruiz, Pérez-González, & Petrides, 2010). This study will test whether the personality profiles of students from two different subjects (psychology and engineering) differ in relation to choice of programme. Also, given that four successive cohorts of Psychology students are used (in relation to self-report measures) this provides a good test of the consistency and comparability of the measures across cohorts.

Summary

In summary, in addition to performance outcomes, this study is also concerned with the behavioural, emotional and cognitive processes that lead to successful performance. Therefore, it will trace these processes through exploration of the operational components of the various constructs, and thus highlight the process as well as the end product of performance. In particular, this research investigates the five personality factors at domain level and item level. Factors and items will be derived from the same questionnaire thus avoiding any disparity between measures and both the 50-item version and 100-item version of the Five Factor Model will be used in order to determine if outcomes differ as a result of this. Focusing on the items will allow more finely grained analysis and may attain more accurate predictions (Vries, Vries & Born, 2011). Although the call for fine grained analysis has been in place for over a decade (Paunonen & Ashton, 2001), the response to this has not been widespread.

In addition to broad and detailed analysis of the Five Factor Model, this study considers standard responses derived from psychology students through previous cohort comparison. The Five Factor Model has shown to be structurally invariant across groups (Allik &

McCrae, 2004), although some variations in expression may emerge (Heine & Buchtel, 2009). Specifically, this study examines whether four cohorts of Psychology students have similar personality profiles as suggested by Sanchez-Ruiz et al., (2010). This leads to the next point of focus for this part of the study: whether the students in all groups have a pro-social factor from the Five Factor Model, such as Agreeableness, as a defining variable (i.e. highest mean score) as might be expected from psychology students (Lantz, 2011). Further, personality profiles are thought to vary according to a student's choice of programme, for example social science students (including psychology) have shown to be higher on Agreeableness than technical science students (Larson, Wei, Wu, Borgan, & Bailey, 2007); this will be explored through assessment of mean differences between psychology and engineering students. Thirdly, this part of the study tests whether mean scores across the five factors will be comparable across the groups and whether the rank order of mean scores is also comparable. Although the factor of interest in relation to academic performance is Conscientiousness, there is also focus on the full range of factors within the Five Factor Model, and the totality of scores across the spectrum within all groups in relation to academic performance and behaviours, emotions and cognitions. Whether individual differences shown in the measures of dispersion are more accentuated than group differences, as shown by mean scores, will also be considered on all the Five Factor Model factors (Heine & Buchtel, 2009).

Furthermore, in light of call from the literature, the present study will analyse the factors and items of personality in relation to academic performance using diverse outcome variables including module specific grades, individual examination grades, individual coursework grades and Grade Point Average. To date no other study has offered such a comprehensive range of outcome variables. This study integrates a unique combination of factors that result in a unique approach that adds real value to previous research. First, predictive validity is explored at both factor and item level. Secondly, outcome measures (indicators of academic performance) are tested at Grade Point Average and subject specific levels (both through exams, coursework and their combination). Thirdly, given that more than one cohort of students will be involved, all measures in the study can be tested for invariance across each cohort used to test the stability and consistency of the findings. Fourthly, the latter aspect will test if there are any factors from the Five Factor Model that are consistently endorsed across four cohorts of students.

Finally, a real strength of this study is the combination of a validated self-report measure with actual, rather than self-reported grades – a trend that has become increasingly popular (Szafranski, Barrera, & Norton, 2012). The present study therefore reduces the risk associated with common or shared method variance (Tabachnick & Fidell, 2007).

Findings in the literature lead to the following hypotheses:

H_1. Factors of personality, particularly conscientiousness will be significantly and positively related to academic performance. Given the mixed findings for emotional stability and openness to experience a direction is not specified. There is no expected relationship between agreeableness or extraversion and academic performance.

H_2. Items of personality will show direct predictive validity in relation to academic performance.

H_3. Use of module specific averages, coursework and exam grades will prove advantageous over combined Grade Point Average

H_4. Five Factor Model norms will be invariant across cohorts.

H_5. Students will endorse agreeableness highly as a defining factor for Psychology students, with narrower dispersion around the mean than in the other factors. In addition it is proposed that agreeableness will be less pronounced in engineering students.

In addition to the five formal hypotheses, whether the 100-item Five Factor Model will be advantageous over the 50-item version of the Five Factor Model will also be assessed, as it taps a greater content breadth.

1.2 Method

Design

This study is a quantitative, cross-sectional survey using self-report measures which are aligned with recent academic performance indicators. In addition to this primary within-participant design, there were also between group cohort comparisons. The Independent Variables are the self-report measures. The Criterion Variables are the indices of academic performance including overall Grade Points Average (Grade Point Average), yearly averages, specific coursework grades, exam grades and module averages. All data will be

tested for assumptions in relation to normality, homogeneity, reliability and will control for type 1 errors.

Participants

The present sample comprised *N* = 404 (234 level 5; 170 level 4) participants; *N* = 535 participants were originally recruited but some were removed due to incomplete self-reports or missing academic performance results and level six were later removed due to a very low sample size. Level four results are only displayed in the appendix as associations were insignificant. The majority of the participants were female (84 male and 320 female) aged between 18– 54 years (mean age 20.26) and most were Caucasian (97 %). An opportunity sample of Applied Psychology and Combined Psychology (all Psychology majors) students took part. The students' academic performance was combined with current self-reports to facilitate testing the association of personality measures with academic performance. It is important to note that the survey measures are self report and based on perceptions of self rather than actual abilities, however association with performance indicators negates the potential problem of shared method variance (Tabachnick & Fidell, 2007). Personality profiles derived from the measures were used to predict student grades (specific modules and averages) collected at the end of the academic year. Self-report data were collected from each student only once and were analysed in relation to grades across levels 4 and 5.

Students, past and present, were included in the cohort comparison. These were undergraduate students enrolled on a Psychology programme at a university in the North West of England, UK (*N* = 770). The majority of the sample was female. All students were in the second year of their study programme (level 5), with an average age of 20 years. Some of the data presented preceded the commencement of the current study and is used only for normed comparison.

Further, *N* = 236 students from technical sciences (Engineering), from across levels 4, 5 and 6 (41, 34 and 24% respectively) were added to the data to test personality profiles across majors. The undergraduates were enrolled at LJMU and were mainly male (91.5%). The data were used to augment the cohort comparison data. Whilst there may be differences relating to subject, any such differences may also be attributable to gender.

Materials

Five Factor Model (Goldberg et al., 2006).

The Five Factor Model self-report measure was distributed to the participants (see Appendix 3.1). The Five Factor Model is highlighted in the relevant literature and has sound psychometric properties, for instance good reliability, factor structure and predictive validity. Both the 50 and 100-item inventory have 5 scales; these are Conscientiousness, Openness to Experience, Extraversion, Agreeableness and Neuroticism. Items include statements such as "I don't talk a lot" [E], "I have a soft heart" [A], "I like order" [C], "I seldom feel blue" [N] and "I use difficult words" [O]). The inventory is presented with a 5-point Likert response format with anchor points ranging from 1 (very inaccurate) to 5 (very accurate); some items were reversed to avoid response set bias. There are 20 items in each of the 5 factors and higher scores are aligned to each factor label. Each of the five subscales in this study elicited high reliabilities (α = 0.89, 0.85, 0.94, 0.89 and 0.91) for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness and respectively.

The 50-item version of the Five Factor Model was used to compare norms across cohorts as this was the measure used previously in all previous cohorts (see appendix 3.2). This measure is extracted from the 100-item version and is scored in the same way except there are 10 items in each factor rather than 20. The reliability of the subscales elicited moderate to high reliabilities (α = 0.85, 0.78, 0.89, 0.74 and 0.83) for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness respectively.

Measures of academic performance

Cumulative Grade Point Averages, module specific averages, coursework and exam results for each module were collected from the School database. Each cohort of Psychology students were assessed by a mixture of coursework and exam.

Exams: the duration of exams is 2 hours and typically comprises 6 questions from which a student must answer 2. Some exams have one seen question and one unseen and one exam has an essay question and a multiple choice section.

Coursework: This comprises set questions that are put in place at the beginning of each semester. Essay length varies with some being relatively short (e.g., 500 words) and others

much longer (e.g., 2,500 words). The minimal pass mark for both exams and coursework is 40%, and 10% are internally and externally moderated for quality control.

Dissertation: this is a year long project for which students must engage an appropriate statistical analysis for their study; importantly the dissertation accounts for almost one third of the final year grade (36 of 120 credits). Students have access to tutor support throughout the project.

Average mark: mean yearly averages were collected for each cohort.

Award mark (GPA): the mean mark awarded at the end of studies.

Procedure

The self-report measures were distributed to the participants during a regular seminar session and online via SONA. Each self-report bank took approximately 30 minutes. Study information, consent forms and guidelines for completing the forms were provided in written form at the beginning of the self-report bank (see appendices 2.1 to 2.3). It was explained to the participants that their progress would be tracked throughout their time at university and that their grades would be accessed through the central admissions system. No incentive for participation was offered other than the opportunity for general feedback on their personality profiles.

Ethical Considerations

Approval for the study was given by the Liverpool John Moores Psychology Ethics Committee (appendix 1). In accordance with the British Psychological Society Ethical Guidelines, participants read an information sheet designed to inform them about the study and why they were chosen to take part. The measures are not for clinical use and are used by the students throughout their degree as part of their studies. Participants were assured their anonymity and confidentiality would be maintained and informed of their right to withdraw from the study at any time with their data being destroyed. The participants were advised that their student numbers would be used in place of their names as identity markers and that these would subsequently be removed once the performance markers were aligned with the self-report data. An e-mail address was provided in case the participants experienced any distress upon completion.

Statistical Analyses

Data analysis includes descriptive and inferential statistics and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled. All data were tested for assumptions in relation to normality, reliability and the potential for type 1 errors was accounted for. Correlation and multiple regression analysis were used to test the hypotheses and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled, and levels of skewness and kurtosis were consistently low (typically < 1.96). Any missing data were input as -9. Students who did not sit *any* examinations or complete any coursework were excluded from the analysis as a central aim was to relate the self-report measure to academic achievement. Students that completed part of their assessment however were kept in. This did not affect Cronbach's Alpha but it is possible these missing values may have depleted the correlations.

Firstly, the data were screened in order to examine distribution, means, standard deviations, skewness and kurtosis (range: -.112 to -.707 and .151 to .661) for skewness and kurtosis respectively. The study's hypotheses were tested at bivariate level through correlations analyses, and at multivariate level through Multiple Regression. Multiple regression analyses were conducted based on the significant associations from the correlation analysis. All Standard Errors (SE) for each multiple regression were acceptably low. The multiple regression analyses facilitated further refinement of the study's hypotheses and allowed for eliciting the combined variance from the self-report measures and the identification of the most robust associates of academic performance.

1.3 Results

Table 1.1: FFM means and standard deviation for student cohorts, 2009 – 2012 (and mean rank order within each group)

Cohort	Factor (in rank order)	Mean	SD	Mean Rank Order
2009	Agreeableness	41.60	4.99	1
	Openness	36.04	5.29	2
	Extraversion	35.29	7.16	3
	Conscientiousness	31.84	7.34	4
	Emotional Stability	30.52	8.54	5
2010	Agreeableness	40.81	5.34	1
	Openness	35.17	6.19	3
	Extraversion	35.24	7.62	2
	Conscientiousness	32.40	8.09	4
	Emotional Stability	28.48	8.02	5
2011	Agreeableness	41.73	4.75	1
	Openness	35.91	5.46	2
	Extraversion	31.83	7.93	3
	Conscientiousness	32.35	7.37	4
	Emotional Stability	28.82	8.49	5
2012	Agreeableness	40.36	5.25	1
	Openness	35.60	6.50	2
	Extraversion	35.51	6.64	3
	Conscientiousness	33.72	7.93	4
	Emotional Stability	30.08	6.33	5

*NB. The mid point for each factor is 30

A MANOVA showed that there was no significance between groups ($p>.05$). Further, stable means are demonstrated across groups with some minor differences in order of rank (all groups). The 2012 cohort is highest on Conscientiosness; the 2010 cohort scored slightly higher on Extraversion and slightly lower on Openness than the other groups, but there is only a marginal difference between means. Agreeableness is invariably first for all groups and Openness emerges as second. Extraversion is third in three of the four groups, and Conscientiousness is fourth for all groups. There is also good dispersion within each

factor with tighter dispersion for Openness and for Agreeableness, but especially for the latter.

It is evident from the table that the individual differences reflected in the standard deviations (within groups) are much more pronounced than the mean differences across cohorts when compared with each of the five factors e.g., the mean score for Agreeableness is much higher than the midpoint (30) and has the least dispersion; this indicates that Psychology students are highest on Agreeableness. It is clear that for all cohorts, Agreeableness is the defining variable; the mean is consistently the highest (40.36 to 41.73) and the standard deviations are the tightest around the mean than any other factor (4.99 to 5.34).

To further test the assumption that Agreeableness is a defining trait in Psychology students means and standard deviations were collected from 236 technical science (Engineering) students (M=37.81; SD=5.846); whilst there is still tighter dispersion than 3 of the other factors (Extraversion, Conscientiousness and Emotional Stability) the mean is much lower than the Psychology cohorts, further illustrating that Agreeableness is a defining factor for Psychology students. As well as subject differences however, it should be noted that this could be attributable to gender differences with Psychology students being female in the majority and Engineering students being male in the majority.

The good quality of the data is demonstrated with low levels of skewness and kurtosis (range: .080 to .700 and -.077 to - .572 for skewness and kurtosis respectively, therefore not departing from normality (>1.96). Further, all assumptions were met for the multivariate tests, homogeneity ($p>.001$) and for the univariate tests, Levene's test of equality scores for each factor have homogeneity of variance ($ps>.001$). For the combined cohorts each of the five subscales elicited high reliabilities across all cohorts ($\alpha = 0.86$, 0.73, 0.84, 0.78 and 0.78) for Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness and respectively.

Table 1.2: Means and Standard Deviations for Level 5 Grades and FFM 50(100)-item Inventories for 2012 Cohort

	Mean	Standard Deviation	Skewness	Kurtosis
RMCW1	57.31	11.761	-1.060	.978
RMCW2	59.40	9.700	-.864	1.887
RMExam	57.55	21.204	-.284	.492
RMAverage	56.66	12.400	-1.114	1.500
BCDCW1	60.57	7.868	-.378	1.077
BCDCW2	60.87	8.191	-.641	2.087
BCD Exam	55.95	14.576	-1.201	1.768
BCD Average	57.82	9.185	-1.134	2.118
SPID CW	65.06	5.717	-.122	1.005
SPID Exam	59.77	7.925	-.520	1.062
SPID Average	62.47	5.746	-.680	2.207
Level 5 Average	35.57	59.20	-.876	1.013
Extraversion	35.51 (66.57)	6.56 (11.35)	-.707 (-.566)	.425 (.245)
Agreeableness	40.52 (78.46)	5.15 (9.43)	-.671 (-.557)	.661 (.847)
Conscientiousness	37.37 (66.57)	8.49 (16.05)	-.277 (-.216)	-.454 (.536)
Emotional Stability	30.98 (62.73)	6.56(13.46)	-.112 (-.124)	-.438 (.426)
Openness	35.57 (71.60)	6.50 (12.47)	-.277 (-.288)	.153(.217)

*NB. Mid point for FFM 50-item inventory is 30; mid point for FFM 100-item inventory is 60

Key: RM = Research Methods BCD = Biological and Developmental Psychology SPID = Social Psychology and Individual Differences CW = Coursework

Mean results for indicators of academic performance are quite narrow ranging from 55.95 to 62.47; the standard deviations however are wide ranging, particularly for Research Methods exam. This is marked differently to both exams and coursework for other modules as student answers are either right or wrong, with less scope for awarding credit subjectively. The coursework for Research Methods and the coursework and exams for other modules are all written pieces that involve the student developing an argument and supporting this with evidence. Biological, Cognitive and Developmental is more diverse than other modules and covers a large range of material and the large standard deviation in the exam may be because there is more choice on the exam than in the other modules. For most modules the mean scores are below the 2:1 level set as a University target for more than fifty percent of students (i.e. when projected to final 2:1 classifications). Also, students tend to perform better on coursework than on exams, and the poorer exam performance depresses the module mean in general. Moreover, the higher standard

deviations on exams reflect very strong individual differences on exam performance and this tends to highlight the weaker students in particular, especially given that all exam marks are below 60%.

With regard to the Five Factor Model, Agreeableness once again is shown as the highest mean score. Conscientiousness is moderate which is consistent with research by Cucina and Vasilopoulos (2005). The Five Factor Model scores generally demonstrate the kind of responses that might be expected from a student sample, for instance the different mean scores, high reliabilities and good dispersion within each factor suggest discriminatory and systematic response patterns. The good quality of the data is demonstrated with low levels of skewness and kurtosis (range: -.112 to -.707 and .151 to .661 for skewness and kurtosis respectively) and not statistically significant ($p < 1.96$). High reliabilities were also elicited (.78 - .89). Strong individual differences across the academic performance indicator and self-report measures are indicated by the measures of dispersion (standard deviation) reflecting performance and response deviation from the means. The mean scores on the Five Factor Model are within the parameters 30.98 (Emotional Stability) to 40.52 (Agreeableness) and so are clustered slightly above the midpoint which is 30 for each factor. The substantial standard deviations on each factor (range 5.15 to 8.49), tightest as expected for Agreeableness and widest for Emotional Stability which reveals strong individuality of responses within the sample – with no extreme scores (i.e. > 41).

Table 1.3: Correlation Table - Level 5 FFM 50 and 100 items with Academic Performance indicators

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RM CW2(2)	.397**														
RM Exam(3)	.512**	.428**													
RMAverage(4)	.775**	.719**	.719**												
BCD CW1(5)	.238**	.191**	.241**	.239**											
BCD CW2(6)	.456**	.411**	.415**	.509**	.246**										
BCD Exam(7)	.180**	.192**	.419**	.302**	.121**	.260**									
BCDAverage(8)	.350**	.346**	.538**	.541**	.428**	.619**	.774**								
SPID CW(9)	.437**	.296**	.315**	.429**	.281**	.355**	.159*	.287**							
SPIDExam(10)	.275**	.269**	.280**	.318**	.226**	.346**	.370**	.428**	.234**						
SPIDAverage(11)	.401**	.355**	.370**	.429**	.286**	.442**	.256**	.543**	.623**	.852**					
EXTRA (12) 50 100	-.054 -.037	.061 .047	-.037 .015	.015 .029	.025 .036	-.007 .034	.046 .055	-.015 .004	-.076 -.053	.058 .060	-.003 .013				
AGREE (13)	.017 .030	.017 -.050	.018 .017	-.007 -.017	-.008 -.010	-.057 -.020)	.050 .068)	.008 .030)	-.039 -.065	.112 .080	.083 .058	.004 .095			
CONSC (14)	.055 .007	.208** .199**	.225** .217**	.183** .178**	.042 .053	.123 .120	.118 .107	.157* .135*	.136* .115	.144** .160*	.211** .206**	-.107 .006	.163* .151*		
ES (15)	.146* .119	.041 .023	.084 .096	.153* .128	.050 .071	.150* .144*	-.019 -.031	.144* .138*	.130 .138*	-.118 -.115	.010 .027	.007 .019	.020 .035	.003 .008	
OPEN (16)	-.041 -.055	.091 .073	.103 .096	-.006 -.025	.003 .022	.098 .093	.125 .082	.079 .058	.079 .054	-.031 -.056	-.014 -.025	.135 .111	.027 .047	.159** .221**	.110* .162*

*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed)

Key: 1=Research Methods Coursework (CW) 1 2=Research Methods Coursework 2 3=Research Methods Exam 4=Research Methods Average Mark 5=Biological, Cognitive & Developmental Psychology Coursework 1 6= Biological, Cognitive & Developmental Psychology Coursework 2 7= Biological, Cognitive & Developmental Psychology Exam 8= Biological, Cognitive & Developmental Psychology Average Mark 9=Social Psychology and Individual Differences Coursework 10= Social Psychology and Individual Differences Exam, 11= Social Psychology and Individual Differences Average Mark 12=Extraversion 13=Agreeableness 14=Conscientiousness 15=Emotional Stability 16=Openness to Experience.

There are moderate to strong correlations between coursework and exams for all subjects. The correlations between the factors of the Five Factor Model and academic performance are mixed, showing significance for only Conscientiousness (range r = .135, p<.05 to .225, p<.01) and Emotional Stability. There is little difference between the 50-item version and the 100-item version of the Five Factor Model but the majority are stronger for the 50-item version. The only extra correlation picked up by the 100-item version is between emotional stability and Social Psychology and Individual Differences (r=.138, p<.05). Whilst there are three extra correlations detected through the use of the 50-item version; these are between Conscientiousness and Social Psychology and Individual Differences coursework (r=.136, p<.05) and between Emotional Stability and Research Methods coursework 1 (r=.146, p<.05), and Research Methods average mark (r=.153, p<.05). Level average was only significantly correlated with Conscientiousness (r = .214, p<.01) but showed no effect with Emotional Stability. This is in accordance with the hypothesis that significant associations are lost when average is amalgamated into one variable and supports the use of module specific averages, coursework and exam grades. A very useful finding here is that the 50-item version may be more efficient than the 100-item version of the Five Factor Model and is thus recommended for future use.

Examination Clusters

With regard to research methods, associations are positive and moderate to strong as expected. Therefore, the rank order tends to be maintained across the performance indicators, although the correlations also allow for some variation, suggesting that each assessment task provides unique elements of challenge. However, it is clear that each assessment task contributes strongly to the average mark. Biological, Cognitive and Developmental, as with Research Methods, show all assessment components are strongly associated with the average module mark, although not as consistently. All associations are positive with a tendency for rank order to be maintained, however this is weak for coursework and exams. For Social Psychology and Individual Differences associations are again positive and both assessment components make a strong contribution to module average but coursework and exam are not strongly associated with each other. Clusters 4 to 6 show associations between modules in coursework and exams, the pattern is consistently moderate and positive with a few exceptions. Students tend to perform consistently but there is some variation across the indicators suggesting distinct features of each assessment task. The inter-correlations within the Five Factor Model are generally low for both

versions (50 and 100); this supports the assumption that the factors are orthogonal (uncorrelated) or at least fairly independent. This indicates there is no problem with multicollinearity (Tabachnick & Fidell, 2007).

Summary of Five Factor Model correlations

It can be seen from the correlation table that Conscientiousness is significant in 7 of the 11 indicators. Emotional Stability is significant in 5 of the 11 indicators; Conscientiousness emerges in relation to coursework, exam and average marks; Emotional Stability emerges in relation to coursework and average but not exam. Further, Emotional Stability emerges in relation to Research Methods average, but not in the two specific assessment components. It is apparent that there is added value in examining both Grade Point Average and individual components as an either/or approach would disguise important associations.

Table 1.4: Correlation Table - Analysis for Conscientiousness at item level [50 and (100)]

FFM50(100)	RM CW1	RM CW2	RM Exam	RM AV	BCD CW1	BCD CW2	BCD Exam	BCD AV	SPID CW	SPID Exam	SPID AV
Item 21(41)	.030	.212**	.234**	.180**	.051	.165**	.159**	.204**	.029	.187**	.177**
Item 22(42)	.038	.189**	.243**	.134**	-.020	.054	.061	.060	.041	.032	.063
Item 23(43)	.076	.145**	.194**	.096	.002	.054	.084	.094	.114	.189**	.210**
Item 24 (44)	.082	.177**	.145**	.194**	.024	.070	.072	.087	.101	.135*	.174*
Item 25 (45)	-.023	.191**	.140**	.162*	.021	.104	.097	.119	.101	.159*	.184**
Item 26 (46)	.089	.169*	.217**	.178**	.104	.190**	.120	.140*	.220**	.107	.197**
Item 27 (52)	.060	.035	.116	.120	-.006	.084	.052	.109	.095	.027	.098
Item 28(53)	.024	.210**	.184**	.150*	.076	.147*	.046	.133*	.147*	.071	.156*
Item 29(64)	.118	.107	.064	.067	-.023	-.004	.021	.037	.072	-.009	.069
Item 30(55)	.047	.136*	.148*	.092	.084	.092	.100	.137*	.135*	.088	.169**
FFM100											
Item 47	.028	.180**	.109	.116	.127	.115	.083	.143*	.110	.187**	.223**
Item 48	.033	.069	.158*	.190	.031	.066	.096	.036	.068	.110	.115
Item 49	-.037	.173*	.126	.082	.044	.050	.143*	.103	.006	.233**	.179
Item 50	.055	.177**	.142*	.200**	.033	.012	.121	.077	.018	.202**	.163*
Item 51	.088	.102	.115	.097	.002	.120	.030	.052	.083	.118	.128
Item 56	.096	.119	.161*	.110	.123	.040	.047	.103	.102	.104	.181**
Item 57	.022	.046	.051	.034	.032	.037	-.028	-.013	-.049	.042	.033
Item 58	.036	.155*(*)	.162*	.100	.011	.121	.069	.132*	.032	.068	.117
Item 59	.052	.109	.193*	.150*	.064	.088	.039	.077	.083	.132*	.152*
Item 60	.100	.071	.124	.094	-.003	.052	.074	.043	.071	.008	.052

*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed)

Key: RM CW1 = Research Methods Coursework 1 RM CW2 = Research Methods Coursework 2 RM Exam = Research Methods Exam RM AV = Research Methods Average BCD CW1 = Biological, Cognitive & Developmental Psychology Coursework 1 BCD CW2 = Biological, Cognitive & Developmental Psychology Coursework 2 BCD Exam = Biological, Cognitive & Developmental Psychology Exam BCD AV = Biological, Cognitive & Developmental Psychology Average SPID CW = Social Psychology and Individual Differences Coursework SPID Exam = Social Psychology and Individual Differences Exam, SPID AV = Social Psychology and Individual Differences Average.

Analysis at item level for Conscientiousness reveals which items are associated with academic performance. Consistent with the broad correlations no aspect of Conscientiousness is related to Research Methods coursework 1 or Biological, Cognitive and Developmental Psychology Coursework 1. However, there are differences, whereas Conscientiousness does not correlate with Biological, Cognitive and Developmental Psychology Coursework 2 or Biological, Cognitive and Developmental Psychology exam using the broad factors, it is clear to see that some items are working in relation to both these academic outcomes at item level, indicating that using the broad domains may hide some of the intricacies only brought out through finer –grained analysis. Although the correlations for the 50 item version of the Five Factor Model are stronger predictors of academic performance than the 100-item version (albeit marginally) in the investigation of the factors, analysis at item level reveals that a number of items from the 100-item inventory are positively related to academic performance. This suggests once again that by considering only the broad factors some of the predictive power of the Five Factor Model is lost. However, as the 100-item does not correlate with academic performance at a stronger level than the 50-item version, rather at a lower level, this implies that it may not be advantageous to use this version even though it has more items; indeed this may reduce the statistical power of the Five Factor Model. Although, the Five Factor Model is not designed to measure academic performance per se, it is clear that the majority of items for Conscientiousness are positively related. However, this does not imply that the wider measure does not have other advantages in higher education if the criterion space is widened beyond academic performance, for example attendance, class interaction etc.

Table 1.5: Correlation Table - Analysis at item level for Emotional Stability (50 and 100)

FFM50(100)	RM CW1	RM CW2	RM Exam	RM AV	BCD CW1	BCD CW2	BCD Exam	BCD AV	SPID CW	SPID Exam	SPID AV
Item 35 (68)	.144*	.115	.095	.101	.034	.190**	-.001	.123	.087	-.012	.036
Item 36 (69)	.122	.082	.103	.161*	.071	.152*	-.014	.137*	.127	-.217	-.048
Item 37 (70)	.077	-.023	.077	.067	.019	.085	-.015	.066	.045	-.110	-.024
Item 38(71)	.154*	-.013	.073	.138*	.049	.097	-.044	.104	.070	-.084	.015
Item 39(72)	.119	-.012	.042	.133*	-.014	.057	.003	.059	.077	-.112	-.067
Item 40(73)	.087	.072	.077	.165*	.157*	.110	.045	.197**	.110	-.025	.067
FFM100											
Item 76									.168**		
Item 77						.160*		.170*	.160*		
Item 78						.142*					
Item 79						.204**		.139*	.180**		
Item 80											.181**

*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed) Key: See table 1.4

A similar pattern emerges for Emotional Stability; there is a relationship between item 40 of the 50-item Five Factor Model and Biological, Cognitive and Developmental Psychology coursework 1, which is not shown through broader analysis. A relationship is also shown between item 80 (100-item Five Factor Model) and Social Psychology and Individual Differences average mark, whereas broader analysis indicates there is no significant relationship for the factor overall. Although the correlations for Emotional Stability overall are stronger for the 50-item version of the Five Factor Model, this analysis supports the use of the 100-item version in relation to Social Psychology and Individual Differences coursework. However, only the 50-item version correlates with Research Methods coursework 1.

Of the Five Factor Model 50 item inventory, Extraversion item number 5 has shown significance with Biological, Cognitive and Developmental Psychology exam ($r = .158$, $p<.05$) and item 7 has shown significance with Research Methods coursework 1 ($r = .144$, $p<05$). Whereas, item 19 from the 100-item version has shown a significant association with Biological, Cognitive and Developmental Psychology coursework 1 ($r =. 154$, $p<.05$), exam ($r = .156$, $p<.05$), and average ($r = .132$, $p<.05$) Also, with Social Psychology and Individual Differences exam ($r = .169$, $p<.01$ and average mark ($r = .183$, $p<.01$) indicating that this is an important item in relation to academic performance. This association is masked by analysing only at the factor level.

With regard to Agreeableness item 18(35) was significant (rs. =.134, .152, .149, ps<.05) with Research Methods coursework, exam and average mark respectively. From the 100-item inventory item 30 was significant with Research Methods average (r=.141, p<.05) and item 31 was significantly and positively related to Research Methods coursework 1 (r=.137, p<.05) and Research Methods average (r=.151, p<.05). Again, these associations were masked by broad analysis intimating the benefits of analysis at item level in relation to academic performance.

Finally, a number of items from the Openness scale were significantly and positively related to Academic Performance. Results indicate an association between item 44 and Research Methods coursework 2 (r=.154, p<.05), Research Methods exam (r=.192, p<.01) and Social Psychology and Individual Differences coursework (r=.138, p<.05) and between item 48 and Research Methods coursework 2 (r=.138, p<.05) for the 50-item version of the Five Factor Model. Additionally, between item 89 and Research Methods exam (.134, p<.05); item 90 and Research Methods exam (r=.230, p<.01); and between item 100 and Research Methods coursework 2 (r=.169, p<.05) for the 100-item version. There is evidence here of a relationship between Openness and Academic Performance, however this is only revealed through analysis at item level; any indication of a relationship is subsumed by considering the factor a whole.

It is evident that analysis at item level is useful as it shows some connection between Personality and Academic Performance for all aspects of personality; however all these potential relationships are masked through analysis of only the broad domains. Although there are some benefits to using the 100-item version of the Five Factor Model overall there appears no statistically viable reason to use the 100-item version over the 50-item concluding that the 50-item version is sufficient for analysing both the broad factors of the Five Factor Model and for more in-depth analysis at item level. Items at the $p<.05$ level should be treated with some caution to allow for type 1 errors.

*Correlations were run for level 4; however none were significant (appendix 4).

Table 1.6: Multiple Regression Analyses to show average marks regressed on the FFM factors: Conscientiousness and Emotional Stability

	RMAV			BCDAV			SPIDAV		
	B	SE	β	B	SE	β	B	SE	β
Conscientiousness	.27	.09	.18**	.17	.07	.16**	.14	.04	.21**
Emotional Stability	.29	.12	.15*	.20	.09	.14*	.01	.06	.01
F	(2,221) = 6.661**			(2,225) = 5.294**			(2,230) = 5.351**		
R^2 =	.06			.05			.04		

****p<.001 **p<.01 *p<.05 SE Range (.006- .025)*

Table 1.6 summarises three multiple regression analyses with Research Methods average mark, Biological, Cognitive and Developmental Psychology average mark and Social Psychology and Individual Differences average mark on two factors of the Five Factor Model. All three models were statistically significant as shown by the F-values ($p < .01$), and accounted for 6, 5, and 4% of the variance on academic performance for Research Methods average, Biological, Cognitive and Developmental Psychology average and Social Psychology and Individual Differences average respectively as shown by R square. When Conscientiousness and Emotional Stability are compared, it can be seen by the inferential test that both account for unique variance on Research Methods and Biological, Cognitive and Developmental average but only Conscientiousness is significant for Social Psychology and Individual Differences average. Conscientiousness accounts for more variance on Social Psychology and Individual Differences, Biological, Cognitive and Developmental, and Research Methods averages respectively. Emotional Stability accounts for more variance on Research Methods than Biological, Cognitive and Developmental, but the difference is marginal.

1.4 Discussion

It is evident that the whole student experience at university is determined not only by ability and previous grades but also by individual difference variables such as Personality (Poropat, 2009). Personality has been researched extensively in Higher Education, primarily in predicting academic performance. Personality is defined as an individual's predisposition to behaviours, cognitions and emotions (Bidjerano & Dai, 2007). Such individual differences inform how much effort an individual might expend on a task, their time management and organisational skills, their information processing and critical thinking abilities and how they manage their emotions. With such a diverse range of capabilities it should be expected that personality will relate not only to academic success but also to the process and product of educational attainment. The purpose of this study was to add to the existing literature on the personality and academic performance relationship and to highlight the importance of personality to the whole academic experience. Considering a wider criterion space as suggested by Ackerman et al., (2011) ensures that consideration is not only given to performance outcome but also to core, transferrable skills that have shown to be useful in personal development and work experience beyond graduation (York & Knight, 2006).

Cohort comparisons

This chapter firstly compared Psychology students' responses to the Five Factor Model of Personality on mean scores, dispersion and rank order. This data has proved beneficial in a variety of ways: within each group, there are mean differences across the five factors and the pattern of difference in one group to a good extent mirrors the pattern of difference in the other. It can be observed in Table 1 that, in terms of rank order in mean scores for the five groups, all have Agreeableness first and Emotional Stability last. All groups except the 2010 cohort have Openness second and Conscientiousness fourth. Such a test across so many samples over successive cohorts has not been attempted before or at least reported in the literature, and the stability of the findings provide confidence in the future use of the measures for empirical and pedagogical work.

As noted, Five Factor Model scores demonstrated between group similarities and individual differences were invariably stronger than group differences for all cohorts. In addition to the similarities in rank order and in the closeness of the mean scores to each other, the measures of dispersion are also remarkably close to each other on Extraversion,

Agreeableness and Openness, and not too far apart on Emotional Stability. The measures of dispersion for Conscientiousness are also extremely close for the each group. Furthermore, it is evident that group mean differences on each factor are weaker than within group differences, revealing the individual differences manifested in measures of dispersion, and this is consistent with previous findings (Heine & Buchtel, 2009), although the present study stands alone in accenting this dispersion across successive cohorts.

The good quality of the data demonstrates that the measures have worked effectively across all groups. All cohorts scored lowest on Conscientiousness, this ostensibly resonates with a report by Brennan, Patel and Tang (2009) that UK students are likely to invest less time in study hours per week than other European students. However, they also concluded that UK students are more likely to undertake additional work beyond what is required of them by their universities. This is also consistent with Cucina and Vasilopoulos (2005) who claimed that students with very high levels of Conscientiousness may not always optimise their performance due to their commitment to extracurricular activities. Brennan, Patel and Tang (2009) also suggest UK students have less dependence on their tutors than other European students and so perhaps Conscientiousness may be more highly endorsed where autonomy and initiative are required (Yorke & Knight, 2006).

The value of average marks and subject specific approach with the Five Factor Model

A combined average and subject specific approach has unearthed potentially disguised associations. As postulated, and consistent with previous findings Conscientiousness emerged as the most robust predictor of academic performance (Poropot, 2009; Wagerman & Funder, 2007) for level 5 students. A burgeoning wealth of literature consistently reveals the predictive power of Conscientiousness in academic achievement (Bratko et al., 2006; Conard, 2006; Komarraju et al., 2009; Komarraju et al., 2011). It has also been related to job performance which is vital to the progression of an undergraduate's career (Higgins et al., 2007). In this study Conscientiousness was associated with Research Methods 2, Research Methods Exam and Research Methods average mark; this was expected given that Research Methods reports require focus, attention to detail and systematic writing. The association between Research Methods exam and Conscientiousness was the strongest; this is reflected in the standard deviations around the mean mark which show much more variance than either coursework or module averages suggesting that individual differences are elicited more strongly in the exam. Conscientiousness was not however, associated

with Research Methods coursework 1 and this may be explained by the fact that much more structure and support is provided for the first Research Methods report at level five (year 2), and therefore individual differences may not come into play to the same extent. Conscientiousness was also associated with Social and Individual Differences coursework, exam and average mark. However, Conscientiousness was not associated with Biological, Cognitive and Developmental coursework or exam but it was associated with the module average. This provides some support for the use of module specific averages.

In addition to Conscientiousness, Emotional Stability emerged as an important predictor of grades. In contrast to Conscientiousness however, Emotional Stability was associated with Research Methods 1 and Research Methods average but not Research Methods coursework 2 or exam. This may be because Research Methods 1 may allow emotional stability and regulation to come into play, whereas these individual differences may be subsumed by the requirement of systematic responding and attention to detail that is required for Research Methods 2 and Research Methods exam. Emotional Stability was associated with Biological, Cognitive and Development Psychology coursework 2 and module average but not exam or coursework 1 and it was not associated with Social Psychology and Individual Differences. Although there is a mixed pattern of results for Emotional Stability this research does indicate that emotionally stable students perform better academically. Emotional Stability, as highlighted earlier, is also important for the academic process; individuals who are less emotionally stable are likely to suffer from negative thinking that may interfere with work focus, anxiety, impaired short-term memory, information-processing disruption and consequently impaired performance (Chamorro-Premuzic & Furham, 2003; Friborg et al., 2005; Poropat, 2011).

Although findings suggest there is some validity in using average module marks, level 5 average only significantly correlated with Conscientiousness ($r = .214$, $p<.01$) but showed no effect with Emotional Stability. This is in accordance with the hypothesis that significant associations are lost when average mark is entered as one variable and supports the use of module specific averages, specific coursework outcome and exam grades. Thus, this study's response to the call from Chamorro-Premuzic and Furnham, (2003); O'Connor and Paunonen (2007) and Poropat (2009) to assess both Grade Point Average and specific subjects has proved fruitful. This was also echoed through three multiple regression analyses; Research Methods average, Biological, Cognitive and Developmental Psychology average and Social Psychology and Individual Differences average module

mark were regressed on two significant factors of the Five Factor Model. All three models were statistically significant and when Conscientiousness and Emotional Stability were compared both accounted for unique variance on Research Methods and Biological Cognitive Developmental averages but only Conscientiousness is significant for Social Psychology and Individual Differences average as expected from the results of the correlation analyses. This study highlights the incremental validity of Emotional Stability and Conscientiousness on module averages.

Agreeableness as a defining Factor

In addition to Conscientiousness and Emotional Stability an important finding in this study is the high mean scores on Agreeableness. Although Agreeableness is deemed to be least important in Higher Education in terms of predicting academic performance (Poropat, 2009), it is argued to have wider educational benefits such as facilitating enjoyment of the student experience and developing employability qualities such as team work (Lounsbury et al., 2005; Witt et al., 2002; Yorke & Knight, 2006). A possible mechanism through which Agreeable students may progress further is through obtaining good references from their tutors (Lubbers, Van Der Werf, Kuyper, & Hendriks, 2010). Agreeableness has also been associated with seminar attendance which has shown to be a robust predictor of academic performance (Farsides & Woodfield, 2003). With the current preoccupation with grades for students, it is timely that the value of adaptive personality characteristics should be emphasised. All groups are highest on Agreeableness and thus this might be described as the defining trait for Psychology students. Whilst the Engineering cohort was also highest on Agreeableness, the mean was much lower than that of Psychology students (it could also be the difference between predominantly female and predominantly male samples). Sanchez-Ruiz et al., (2010) found that Personality profiles may predispose students to choose particular university study programmes; consistent with Larson, Wei, Wu, Borgan, and Bailey (2007) this study found that social science students (Psychology) have shown to be higher on Agreeableness than technical science (Engineering) students. Whilst Agreeableness might be less important in other vocations, many Psychology-related careers require working closely and cooperatively with people (Lantz, 2011), and it is therefore valued within this field.

Although the overarching factor of Agreeableness was not associated with academic performance, some items were significant, for instance being on good terms with everyone,

having a good word for everyone and not insulting people. Given that Agreeableness incorporates facets such as, pleasantness, friendliness, modesty and cooperation (Kappe & van der Flier, 2010; Komarraju et al., 2011), as well as interest and concern for others (Costa & McCrae, 1992), this may have a positive impact upon performance by facilitating cooperation with the learning process (Poropat, 2009). It might also be expected that students who have an agreeable personality are skilled and at ease socially and thus spend less time thinking negative thoughts, which could potentially detract them from their studies (Friborg et al., 2005). Perhaps the reason the overarching factor of Agreeableness is not associated with academic performance is because some components of Agreeableness may serve to distract and interfere with study and development as agreeable students may put others' needs before their own. It also plausible that agreeable students might have a large group of friends and participate in non-related academic activities due to cooperating too much, which could have a negative impact on study. Highly agreeable students may also spend less time on their own work and pay more attention to others (Nguyen, Allen & Fraccastoro, 2005). Despite this, Agreeableness involves compliance and cooperativeness, which makes agreeable individuals more likely to consolidate their leaning and regulate their study habits in response to external demands. The willingness to make an effort in learning is consistent with the traits of imperturbability, which is typical of agreeable individuals (McCrae & Costa, 1987). Previous research suggests that Agreeableness is also associated with effort and time management (Vermetten, Lodewijks, & Vermunt, 2001). Although there is a consensus that Agreeableness has the least predictive validity than all the other Five Factor Model factors (O'Connor & Paunonen, 2007; Poropat, 2009), it has value in terms of the overall student experience, and for roles that require harmonious team functioning (Chowdhury & Amin, 2006).

The remaining factors within an educational context

The other important Five Factor Model factor in an educational context is Openness to Experience (Trapman et al., 2007). In terms of rank order Openness has been endorsed as the second highest after Agreeableness with close means and dispersion. This is understandable as Openness has shown to be associated with intellect and intellectual curiosity (Higgins et al., 2007; Komarraju et al., 2011; Poropat, 2009). Although Openness did not emerge as a significant predictor of grades, which is consistent with numerous findings that reported Openness was not a significant predictor of academic performance (Busato, Prins, Elshout & Hamaker, 2000; Kappe & Van der Flier, 2010) certain items of

Openness did show significant associations. These items included the ability to understand things quickly, the ability to understand abstract ideas, catching onto things quickly, handling a lot of information and probing deeply into a subject. These items resonate with research by Le Pine, Colquitt and Erez (2000) who define Openness as the quest for continued growth, knowledge, understanding and adaptability; also with research by O'Connor and Paunonen (2007) who reported facets of Openness such as understanding and intellectual curiosity (probing deeply into a subject) were associated to academic performance but the overarching factor of Openness was not. Lounsbury et al., (2005) report that students with higher levels of Openness may be more likely to enjoy new experiences and thus be open to higher levels of cognitive stimulation. Like Agreeableness, the overarching factor of Openness may not be associated with academic performance as some items may be disadvantageous for students, for instance when they are required to reproduce curricular content, or be systematic in their writing, rather than producing novel responses or engaging in problem solving (Chomorro-Premuzic & Furnham, 2003). Consequently, Openness may not be associated with academic performance directly but may still be important to the overall student experience. Caprara, Vecchione, Alessandri, Gerbino and Barbaranelli (2011) report that Openness is associated with critical thinking, approach to learning and academic adjustment. Lounsbury et al., (2004) argue that Openness reflects the 'ideal student', wherein students who manifest the qualities associated with Openness, such as understanding, curiosity and quest for information, acquire advantage over other students. Moreover, Hair and Graziano (2003) claim that Openness predicts subsequent success for students beyond their immediate education, and therefore may facilitate the transferable skills that students' carry into the next stage of their educational or career journey.

Of all the Five Factor Model factors Extraversion has shown to be least important at tertiary level. It should be noted however, that even some items of Extraversion correlate with academic performance: namely 'I don't mind being the centre of attention', 'I take charge' and in particular 'I am a private person'. This item has been reversed so reveals that being outgoing and open can be related to academic success; in this case it is associated with five of the eleven performance indicators. This is consistent with Richardson and Abraham, (2009) and Parker et al., (2006) who assert that students who ask for help and communicate with their teachers, are able to facilitate the learning process; this is also thought to improve retention rates. These aspects may be useful in general and

to Psychology students in particular; Rosander, Backstrom and Stenberg, (2011) found extraversion to be associated with certain subjects including Social Science. Other aspects of Extraversion may however, detract students from their studies and so affect the Extraversion-academic performance relationship. Students may find it easier to seek help and socialise with other students, enhancing their overall university experience but ultimately possibly distracting them from their studies; distractibility was highlighted by Esyenck (1992) as being a debilitating factor.

Level Four

Findings show a different pattern of results for level four students showing no significant associations between personality and academic performance. This may indicate that certain traits may impact differentially in level four compared with levels five and six. Students in level four are provided with more rigidity, planning, and structured tutor guidance than in later levels where they are required to work independently and on their own initiative. It may also be the case that at this stage students are being nurtured which is important in preparing foundations for future study at tertiary level and beyond. A corollary of this is that the Five Factor Model may not be associated with academic performance for students in the first year of university. This corroborates research by Wagerman and Funder (2007) who reported that the Personality and Grade Point Average relationship, particularly Conscientiousness, almost doubled in students' senior year compared with the freshman (first year) of university. They suggest that the first year is more similar to high school in terms of skill set requirements. There is also the issue of transition; students have to adjust to their new environment, make new friends and adapt to a new way of living and studying. These requirements could temporarily subsume the impact of important individual differences on academic performance.

Limitations and modifications

There are several limitations and modifications that should be noted for this research. Firstly, self-report measures were taken at one point in time only, although they were psychometrically validated and deemed to represent stable, underlying traits. Secondly, self-report measures have harvested some criticism (Zeidner et al., 2008), inherent problems such as social desirability and response set bias remain an issue deeming self-reports ambiguous and open to interpretation (Bing, Whanger, Davison &Van Hook. 2004); however, the quality of the data in this study has been underlined and the self-reports were

used alongside academic performance indicators, thus avoiding the bias of common method variance (Tabachnick & Fiddell, 2007). A further limitation is that the effects of gender were not assessed; this could be considered in future research. Future research would also benefit from considering the evaluation of classroom participation, learning activities and use of incentives. The sample size was adequate but level six was removed due to poor uptake on the self-report measures. Attempts to avoid this should be addressed in future research. Previous performance and Intelligence were not assessed in this research as previous finding suggest they have limited validity beyond personality variables in tertiary education (Furnham & Monsen, 2009). Future research could, however, include ability testing and previous performance to ensure a comprehensive investigation. Another limitation of the study is that it is nomothetic rather than ideographic; comparing mean scores through large samples cannot capture what is really happening within an individual student's experience (Martin et al. 2006). The nomothetic approach is useful in identifying broad general trends that optimise performance for all students. Such an approach cannot demonstrate, however, how much an individual might have improved their personal performance because they have adapted a repertoire of conscientious behaviours. For instance, it does not show how much worse an individual might perform without conscientiousness, or how much better a good achiever who depends on their ability, would be with conscientiousness. Finally, correlations may have been depleted due to a number of missing exam and coursework results which may have affected overall module marks and Grade Point Average. Future studies could attempt to address these limitations and to monitor personal growth trajectories into post-tertiary level education and progress along career pathways.

Summary and Implications

This research has shown cross-cohort invariance overall for the mean factor scores and comparable dispersion scores of the Five Factor Model through a large sample of past and current students. The Five Factor Model has shown to be a sensitive, yet powerful measure that is able to detect differences in personality across different cohorts and majors. Although differences in mean scores at factor and facet levels have been found (Allik & McCrae, 2004), and particular factors may be more valued and accentuated in particular cohorts (Vitterso, 2001), this study suggests that closer approximation of scores may be found across cohorts, particularly where participants have been matched in appropriate criteria. This study has shown that Agreeableness is rated most highly; high scores on

Agreeableness do not necessarily imply that participants in the present study have lost their competitive, individualistic edge as students, but may suggest that they continue to value and maintain the qualities that will fit and prepare them for future job roles within pro-social settings (Brackett et al., 2011). This propensity toward Agreeableness is commensurate with aspirations for many psychology-related careers (Lantz, 2011).

This research has highlighted several important practical, theoretical, didactic and pedagogic implications. This research has confirmed the relative importance of Conscientiousness and Emotional Stability in Academic Performance. Further, as suggested by O'Connor and Paunonen (2007) this study used a wide variety of academic outcome measures not used in previous research and results clearly demonstrate the benefits of this approach. Although the other factors of the Five Factor Model may not have been directly related to academic performance, certain items did show significance in all other factors. Additionally, the impact of the various traits explored here would imply that the distal nature of the impact of students' personalities on ultimate performance may emerge more persuasively as students' progress through education and when independent and less supported study is required (e.g., from level four to level five). Currently there is a preoccupation in the UK with student academic performance outcome, namely grades. Whilst this is very important, Ackerman et al., (2011) highlighted the need to expand the criterion space beyond academic performance. Considering the process and educational experience beyond academic performance is key to understanding how factors such as Agreeableness and Openness to Experience complement ability and support learning (Caprara et al., 2011; Poropat, 2009). Contextualisation of students in the broader sense of behaviours and academic experience would highlight what skills are useful for transition to university life, overall student experience, and student wellbeing and may improve student retention in addition to academic achievement.

Conscientiousness and Emotional Stability could be enhanced through personal development planning by learning skills such as forward planning, time management, organisation and goal setting (Vries, Vries and Born, 2011); also, how to control negative thinking, handle anxiety and regulate mood etc. Agreeableness and Openness could be harnessed by rewarding such things as cooperation and seminar attendance and by linking important curricular to current events (Komarraju et al., 2011). As individual differences in behaviours, emotions and cognitions are highlighted as useful components for study, future research would do well to consider a wider range of individual differences including

Emotional Intelligence, Self-efficacy, Test Anxiety and Wellbeing in relation to academic performance and student experience.

Personality is deemed to be based on genetic predispositions and early childhood experience (Pervin, 2003). It is operationally defined in terms of broad traits – behavioural consistency over time and across situations. As such, it is seen to have a distal impact on academic performance (Bidjerano & Dai, 2007). Recent researchers are calling for more work on mediational variables through which traits may have an indirect effect on academic performance (Caprara et al., 2011). These would include constructs that are academically specific (e.g., Self-efficacy, Test Anxiety, Learning Styles etc.) that are deemed to be more proximal to academic performance. Although the associations in this study are not widely divergent from the effect sizes reported for the Five Factor Model in relation to academic performance (Richardson, Abraham and Bond, 2012) – weighted r =.19 with confidence intervals at .17 to .22, such small effects suggest that research is now at a watershed at which proximal variables need to be introduced. The role of personality in academic performance is beyond dispute, but future studies must demonstrate proximal effects by measuring and comparing direct, indirect and total effects through mediation and path analysis.

Finally, it was important that this study at least replicated the salient finding that is predominant in the literature, that Conscientiousness is the most robust predictor within the personality sphere and that has clearly emerged in this study as Conscientiousness was significant in zero order correlation and multiple regression, and falls within the confidence intervals of a previous meta-analysis. Although this provides basic confidence in the findings, the study augments this in several important ways and thus makes some significant contributions to knowledge:

1. The testing of the five factors over five successive cohorts demonstrates robust and recurring patterns that provide confidence in the measures and a trend in Psychology students' personality profiles. These findings will be useful both for normed referencing and for future students writing PDP activities.

2. The emergence of Agreeableness as the defining factor for Psychology students in all cohorts (as evidenced by the highest mean and lowest standard deviation) has not been previously reported in the literature, at least not as a consistent finding over so many cohorts. This not only supports the suggestion that personality may not only predispose

individuals to choose particular study programmes, but also that psychology students have endorsed a strongly pro-social variable as their defining feature.

3. Collapsing Grade Point Average into its components in a detailed manner and tracing the findings through both Grade Point Average and specific outcomes demonstrated that there is added value in both approaches taken together. This study has added to knowledge by looking not only at Grade Point Average and individual modules but also by components of modules (course work and exams). It emerged that effects can be disguised when an either/or approach is taken.

4. In the analyses the data were explored at a micro level by examining the associations at item level. Although it is usual to expect that traits are comprised of a series of behaviours that co-vary systematically, it is conceivable that individuals who do not endorse the trait at a high level may still adopt aspects of the trait at a particular behavioural level. Results tentatively support that suggestion and indicate that there is pedagogical value in recognising the value of particular behaviours for given tasks.

Chapter 2

Test anxiety and self-efficacy as proximal indicators of academic performance

Abstract

Test anxiety has shown prevalence in education having a negative impact on academic achievement (e.g., Putwain, Connors & Symes, 2010; Putwain & Symes, 2012; Bedewy & Gabriel, 2013); whilst self-efficacy has demonstrated a positive impact (e.g., Alivernini & Lucidi, 2011; Bandura, 2012; Caprara, Fida, & Vecchione et al., 2008). Evidence is mixed in relation to the effects of test anxiety and self-efficacy on academic performance when combined (e.g., Jing, 2007; Koksal, 2009; Muris, 2002; Onyeizugbo, 2010; Nelson & Knight, 2010). The current study collected data from the first and middle years of university for a more accurate reflection of how test anxiety and self-efficacy affect performance at university. Further, the current study utilised a wide range of objective performance outcomes across the entire tertiary programme using longitudinal archival data. The difference in assessing performance using a general self-efficacy measure and an academic measure was also explored. Findings suggest that test anxiety has an impact on performance at all levels of education but is most salient for lower levels in relation to performance outcome. Academic self-efficacy appears to provide a buffering effect against test anxiety in higher levels. Further, academic self-efficacy was found to be a more robust predictor of academic performance than general self-efficacy. Results of analyses are presented and findings discussed; implications and future directions are also explored.

2.1 Introduction

Test anxiety

As discussed previously, one of the most important factors of a student's academic career is academic performance. Many factors can affect whether a student is successful or not; one factor that is reported to be significantly associated with academic performance is Test Anxiety. Whilst in certain circumstances, anxiety can be facilitative and act as a motivator (Cassady & Johnson, 2002; Hardy, Beattie & Woodman, 2007; Daly, Chamberlain & Spalding, 2011), too much anxiety can be debilitative and negatively affect academic performance (e.g., Hembree, 1988; Seipp, 1991; Putwain, 2008; Putwain, Connors & Symes, 2010; Putwain & Symes, 2012; Bedewy & Gabriel, 2013). According to the Yerkes-Dodson principle (Yerkes and Dodson, 1908) physiological arousal can assist

performance to a degree but once anxiety becomes excessive, performance may begin to decrease. Defined as a distinct construct of anxiety, test anxiety occurs in formal testing environments; test anxious individuals appraise assessments as threatening (Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005) and test anxiety can occur before, during and after tests (Taylor & Deane, 2002). Highly test anxious students are prone to worry, distraction and rumination (Keogh, Bond, French, Richards & Davis, 2004) and test anxiety can promote disengagement from learning and ultimately affect retention rates in addition to performance (Cassady 2004). According to Keogh et al., (2004) test anxiety can prevent individuals from reaching their full potential, thus students with debilitating levels of test anxiety may be more academically able than they appear (Lang & Lang, 2010). Chapell, Blanding, Silverstein, Takashi, Newman, Gubi and McCann (2005) and McDonald (2001) reported that students with test anxiety are unlikely to put adequate effort into test preparation or be sufficiently motivated and thus, may not achieve their potential.

Test anxiety is considered to be a multi-dimensional construct consisting of cognitive and affective-physiological components, worry and emotionality (Rana & Mahmood, 2010). There are varying models of test anxiety including the interference model; this is built upon the premise that during evaluative situations students have difficulties retrieving information from memory due to worry and test irrelevant thinking; according to Cassady and Johnson, (2002), this interference can also happen during the preparation stage. Another model explaining this phenomenon is the deficit model, in which students with high test anxiety have ineffective study habits including difficulty encoding and organising material throughout the learning process. An integrated model is also proposed in which both the interference and deficits models coexist (Eysenck, 1982; Naveh-Benjamin, McKeachie & Lin, 1987; Birenbaum & Pinku, 1997; Zeidner, 2007). Further, Cassady (2004) proposes that test anxiety, particularly cognitive test anxiety, is associated with inadequate perceptions and behaviours at all stages of the learning-testing cycle. In comparing the test anxiety models, Hembree (1988) suggests evidence supports the interference model, rather than the deficits model.

The model used in this study is based on a four-factor structure and distinguishes between two cognitive (worry and test irrelevant thoughts) and two affective-physiological (tension and bodily symptoms) components. Test irrelevant thinking comprises distracting thoughts that are not related to the test or thoughts of failure; for instance a student may be unable to

filter out irrelevant thoughts (Keogh et al., 2004). Worry is directly related to thoughts about the test, negative expectations, and possible associated failure. Bodily symptoms is distinct from tension in that bodily symptoms involves arousal of the autonomic nervous system such as headaches, trembling, increased heart rate, sweating, dry mouth; whereas tension involves general feelings associated with anxiety (Mashayek & Hashemi, 2011; McIlroy & Bunting, 2000; Putwain & Symes, 2012). Test anxiety has shown impaired working memory and reasoning skills and the worry component of test anxiety is frequently associated with stronger inverse relationships; this has been attributed to reduced working memory capacity and efficiency (Ashcraft & Kirk, 2001; Derakshan & Eysenck, 2001; Eysenck, Santos, Derekeshen & Calvo, 2007; Mashayekh & Hashemi, 2011; Owens, Stevenson & Hadwin, 2012; Owens, Stevenson, Norgate, & Hadwin, 2008; Putwain, 2008; Rana & Mahmood, 2010; Yousefi, Talib, Mansor, Juhari & Redzun, 2010). Research findings using this four-factor model have thus far been equivocal; however, inverse relationships with academic performance have been reported with worry only (Keogh et al., 2004); worry and bodily symptoms together (Putwain, Connors & Symes, 2010); and with worry, test irrelevant thinking, and tension combined (McIlroy, Bunting & Adamson, 2000).

Research pertaining to the relationship between test anxiety and academic performance is mixed, with some finding no relationship (Burns, 2004; Diaz, Glass, Arnkoff & Tanofsky-Kraff, 2001; Wills & Leathem, 2004), some modest or minimal associations (Cohen, Ben-Zur & Rosenfeld, 2008; Eum & Rice, 2011; Peleg-Popko, 2004; Putwain, 2008; Zeidner, 2007); others that test anxiety is related to some aspects of performance but not to others (Arnkoff, Glass, & Robinson, 1992). This could be dependent upon varying outcome measures of performance; for instance Daly, Chamberlain and Spalding, (2011) reported that test anxiety was associated with general academic performance, specifically a mock exam but not on the main speaking test. Burns (2004) found no relationship between test anxiety and academic performance; however a general measure of anxiety was used as it was anticipated this would capture aspects of test anxiety that a specific measure would not. Also an adapted version of only 7 items, drawn from the State-Trait Anxiety Scale (Spielberger, Gorsuch, & Lushene et al., 1983) was used. Further, test anxiety has been defined as distinct from general anxiety and is thought to happen in a specific testing environment, and when performance is going to be evaluated by others (Putwain, 2008a).

Several researchers suggest that the relationship between test anxiety and academic performance is neither linear nor straightforward, for instance it is thought to be a cyclical process; poor performance can increase test anxiety, and test anxiety can decrease performance (Marsh & Craven, 2006). Establishing when the anxiety becomes problematic can be difficult and may indeed vary amongst individuals. For some individuals test anxiety is always debilitative and no amount of anxiety is helpful; simply being in an evaluative situation can spark high levels of test anxiety. Cassady (2004b) found that even with the removal of external pressure, test anxiety is still relevant. Test anxiety can depend on students' expectations and how well they are prepared for the examination (Burns, 2004) and it can vary depending on how important, or how difficult the assessment is (Burns, 2004; Hembree, 1988; Hancock, 2001), and be particularly prevalent where expectations (from others and self) are high (Goetz, Preckle, Zeidner & Schleyer, 2008). For some individuals test anxiety is present regardless of how high the stakes, or how difficult the tests. Hembree (1988) found that low levels of test anxiety were associated with perceptions of test difficulty, with low test anxious students faring better in exams believed to be difficult and there being no difference in performance outcome when exams were considered easy. Further, for tests perceived as difficult, Hembree found that the relationship between test anxiety and academic performance was stronger for average students than those with low or high ability; there were no significant differences for tests considered to be easy.

Despite mixed findings the majority of researchers report an inverse relationship between test anxiety and academic performance (Cassady & Johnson, 2002; Cassady, 2004; Hembree, 1988; Seipp, 1991; Putwain, 2008b; Putwain, Connors & Symes, 2010; DiBattista & Gosse, 2006; Rana & Mahmood, 2010). The inverse relationship is frequently stronger for the cognitive components; particularly worry (Chapell et al., 2005; Keogh et al., 2004; 2012; Sparfeldt et al., 2005). Despite the strong associations with worry, the other factors should not be underestimated as academic performance has been associated with emotionality in addition to worry (Cassidy & Johnson, 2001; Rana & Mahmood, 2010; Goetz et al., 2008). Further, Anderson and Sauser (1995) rejected the proposition that the emotionality component is not relevant on the basis that autonomic arousal is a necessary accompaniment to anxiety. Although Cassady and Johnson (2001) found no effect on overall SAT scores, emotionality was a significant factor of performance across all three examinations. However, Cassady (2004) found that the emotionality component

was only significant when the cognitive component was also present; students with higher cognitive test anxiety had higher emotionality scores. A comprehensive meta-analysis by Hembree (1988) affirmed that reduced test anxiety accompanies improved academic performance (Grade Point Average). Further, Hembree found that highly test anxious students had less self-control, less acceptance of self and of responsibility, a lower intellectual efficiency and a lower sense of wellbeing. Although the cognitive components of test anxiety are thought to be the most troublesome (Putwain & Symes, 2012), Hembree found that cognitive interventions alone did not improve anxiety symptoms; however, cognitive combined with behavioural treatment was effective; indeed behaviour treatment alone was significantly associated with a reduction in anxiety similar to that of low test anxious students (both emotionality and cognitive components). Hembree asserted that test anxiety *causes* poor performance, as better performance is achieved through test anxiety reduction.

Although research indicates that test anxiety is a cause of academic failure and underachievement (Hembree, 1988; Putwain, 2008) this is a contentious issue; with most research being cross-sectional causality cannot be inferred, only associations established (Cohen, Ben-Zur & Rosenfeld, 2008; McDonald, 2001). However, even firmly establishing associations can be arbitrary. Most studies of test anxiety have either not considered the multimensional nature of test anxiety or have measured its impact with only one outcome item, for instance Grade Point Average. Sparfeldt, Rost, Baumeister and Christ, (2013) attempted to overcome this problem by looking at subject specific factors of test anxiety with school subject specific exams. It should be noted, despite Sparfeldt et al's. logical argument that oral examinations may provoke test anxiety through the additional social component, it is plausible that oral examinations could be marred by social anxiety in addition to test anxiety. Nevertheless, this study found that general test anxiety measures mask specific aspects of test anxiety. Whilst this may be the case, the study may have been too restrictive; it focused only on two subjects (German and mathematics; oral and written), therefore they were unable to assert whether test anxiety existed in all academic subjects or just the ones considered in this study; any general effects may have been lost. Further, the authors did not present much information about the nature of the exams. In much of the literature assessment criteria is not well explained, for instance components of aggregate grades have not been explicitly highlighted as to whether they comprise, essays, reports, written exams, multiple choice, coursework etc. Further, diverse methods of

assessment, differing approaches to study, varying test difficulty, differing outcome measures including Grade Point Average, self-reported Grade Point Average and single test scores, different sample sizes, varying assessment conditions, differences in phases of testing that test anxiety is measured, and varying ages of respondents all make interpreting any consistency between findings problematic (Cassady & Johnson, 2001; Cohen & Ben-Zur; Eum & Rice, 10; Yousefi et al., 2010; Zeidner, 2007). Based on existing evidence, caution is recommended by most in generalising results to the population (Putwain, 2008). Although Sparfeldt et al., did not provide much information about assessment they did suggest further subjects should be added; in light of this the current study assesses a number of specific modules in addition to Grade Point Average so that neither the specific aspects nor general aspects of test anxiety are compromised.

Self-efficacy

The magnitude of the test anxiety/academic performance relationship may be affected by a number of variables; one such variable is self-efficacy. Research suggests that self-efficacy is inversely related to test anxiety and that self-efficacy may mediate or even negate the effects of test anxiety; although research on this is sparse and of the research that is available, findings are mixed. Self-efficacy is derived from Social cognitive theory (Bandura, 1986). Bandura asserts that people's belief in their ability to control their actions, thus their desired outcomes, motivates them to act in ways that will ensure their efforts will be successful. If they do not have self-efficacy they believe they have no control over potential outcomes, or indeed their lives (Bandura, 2006; 2008). Therefore, self-efficacy is the interplay between personal, behavioural and environmental determinants that enable individuals to have control of their lives; it is an individual's belief they can accomplish a task, achieve a future goal, and persist in the face of adversity (Bandura, 2012). Exerting and sustaining effort, along with demonstrating a good degree of competence, sets students on the right path as this often mirrors what is expected in employment (Brady-Amoon & Fuertes, 2011; Bandura, 2012). It is thought that when students believe in their efficacy to regulate their learning, they are more engaged in their academic pursuits (Caraway, Tucker, Reinke & Hall, 2003; Linnenbrink-Garcia & Pintrich, 2011) and able to master their academic goals (Caprara, Fida, Vecchione, Bove, Vecchio & Barbaranelli, 2008); they are also more likely to seek help, more likely to adopt a deep and strategic approach to learning, less likely to doubt themselves and less likely to give up when confronted with difficulties, than their low self-efficacy peers. Further self-

efficacious students tend to be better at solving problems, have higher aspirations and are able to assess their intellectual performance better than those with equal ability but with lower self-efficacy (Habel & Habel, 2010; Linnenbrink-Garcia & Pintrich, 2003; Prat-Sala & Redford, 2010; Zimmerman, 2000).

In general findings suggest that perceived self-efficacy is associated with successful academic performance (e.g., Alivernini & Lucidi, 2011; Caprara, 2008; Chemers, Hu & Garcia, 2001; Feldman, Kim & Elliott, 2011; Ferla, Valcke & Cai, 2009; Hsieh, Sullivan & Guerra, 2007). However, due to methodological limitations causality cannot be inferred from these predominantly cross-sectional studies. Much research has also been conducted with high school students (e.g., Alivernini & Lucidi, 2011; Caprara et al., 2008; Caprara et al., 2011; Diseth, 2011; Usher & Pajares, 2008) and as with test anxiety, the evidence for self-efficacy is mixed. Judge, Jackson Shaw and Rich, (2007) found the effects of self-efficacy were attenuated with the inclusion of other individual differences such as personality. Personality however, is defined as a stable trait, whereas self-efficacy is malleable and situation dependent (Bandura 2000). Research also reveals differing levels of variance for self-efficacy in academic performance, from 1% (Brady-Amoon & Fuertes, 2010) through 21% (Caprara et al., 2008) to 34% (Chemers et al., 2001). An early meta-analysis revealed self-efficacy accounted for 11% of the variance in academic performance (Multon, Brown & Lent, 1991) and a later meta-analysis (Gore, 2006) found that early in semester 1, 10-14% of the variance in academic performance was accounted for; this dropped to between 7 and 9% after controlling for previous performance and increased to 21-35 % in the third semester, suggesting self-efficacy plays a larger role later in a student's academic year. According to Bandura (1986), self-efficacy develops over time when individuals have achieved certain goals or accomplished particular tasks in relation to their desired outcomes.

As with test anxiety, self-efficacy is thought to cover a cyclical process where they impact performance and performance outcome (whether negative or positive) in turn impacts upon self-efficacy & test anxiety (Liem et al., 2008; Phan, 2010; 2011; Linnenbrink-Garcia & Pintrich, 2011; Prat-Sala & Redford, 2010; 2012). The self-efficacy/academic performance relationship has similar methodological issues to the test anxiety/academic performance relationship; numerous measures and adapted versions of the published measures have been used (e.g., Britner & Pajares, 2006; Usher & Pajares, 2006a; 2006b) and unpublished self-efficacy scales have been developed for specific tasks or criteria (Bates & Khasawneh,

2007). Some studies have used general measures, others specific (Phan, 2012), whilst very few studies have utilised both specific and general measures. Self-efficacy can be considered restrictive when used as task specific i.e., with specific subjects or course content (Gore, 2006) and too broad if used as a general, all encompassing measure (Bandura, 2012). General self-efficacy is defined as a global sense of efficacy across a variety of domains (Caraway et al., 2003). Some studies use too few items to be able to adequately capture the multidimensionality of self-efficacy (Hseih, Sullivan & Guerra, 2007). In other cases, researchers present measures but do not provide any sample questions or describe validity, making it difficult to discern if these measures adequately assess self-efficacy (e.g., Stevens et al., 2006).

In his critical assessment of published studies, Bandura (2012) asserts a consistent finding is that increasing self-efficacy leads to efficient self-regulation, enhanced motivation, tenacity and successful performance attainments. However, many studies use students' self-reported grades, aggregate scores such as cumulative Grade Point Average (Alivernini & Lucidi, 2011) or Grade Point Average of only core subjects such as Mathematics, English and Science (Caraway et al., 2003; Putwain & Daly, 2013) or do not state from where the grades have been taken (Hsieh et al., 2007), all of which can be limiting. Further, the variety of measures and academic performance indicators used across studies may affect consistency of results (Brady-Amoon & Fuertes, 2010).

Choi (2005) assessed self-efficacy and academic performance using a general measure, an academic measure and a specific measure and found the combined variance of the three accounted for 9%; both general self-efficacy and academic self-efficacy however were non-significant. This could be that the academic criterion was too specific for any variance to be exacted; this is difficult to determine as the criteria by which performance was measured was not specified. Social cognitive theory suggests that self-efficacy is most predictive when it is measured at the same level as the subsequent performance (Choi, 2005). The current study adheres to this concept by using an academic measure that is specific to academia, yet not restricted to one subject. Whilst Zhu, Chen, Chen and Chern (2011) provide support for this type of measure and found their academic self-efficacy measure to be moderately associated with independent information seeking and academic performance; they did not include the gambit of academic performance indicators that this study employs.

Test anxiety and self-efficacy

Individuals with lower self-efficacy are more likely to experience depression and anxiety; particularly, they may be more prone to anxiety when they are in a situation where performing well is important to them, such as an exam (Bandura, 1986; Bandura, 2012; Linnenbrink & Pintrich, 2003; Usher & Pajares, 2009). Individuals with low self-efficacy believe they do not have the skills to perform well and so their test anxiety is increased; this could mean that students with low self-efficacy experience high test anxiety. McGregor and Elliot (2002) suggest students with high test anxiety are more likely to adopt performance avoidance goals, which are driven by low self-efficacy; according to Cassady and Johnson (2002) this often manifests as procrastination. Students who have both high test anxiety and low self-efficacy perceive tests as threatening and so avoidance behaviours are reinforced (Cassady & Johnson, 2004). Hassanzadah, Ebrahimi and Mahdinejad (2012) suggest self-efficacy may lessen the effects of test anxiety although they do not explore these relations; rather they discuss how they might be associated.

Early research indicated lower levels of self-efficacy were associated with higher levels of test anxiety, and self-efficacy was inversely associated with test anxiety (Bandalos, Yates & Thorndike-Christ et al., 1995; Benson et al., 1994; Betz & Hackett, 1983; Endler, Speer, Johnson & Flett, 2001). Meece, Wigfield and Eccles, (1990) suggested anxiety was mediated by self-efficacy and Pintrich and DeGroot (1990) suggested self-efficacy, rather than anxiety, was predictive of academic performance. The results of these early studies are quite restrictive, and as suggested above, flawed by methodological inconsistencies including different measures of anxiety such as general, state and test anxiety. More recent research by Caraway et al., (2003) found both self-efficacy and test anxiety to be independently associated with Grade Point Average but did not consider their interaction and subsequent affect on academic performance; further, self-efficacy combined with goal orientation and social desirability only accounted 11% of the variance in Grade Point Average. Onyeizugbo (2010) found self-efficacy to be independently and positively associated with academic performance, and test anxiety to be independently and negatively associated with academic performance, accounting for 16 and 39% of the variance respectively. Consistent with Caraway et al., Onyeizugbo did not consider the interaction between the two variables. However, in a follow up study Onyeizugbo (2010b) did consider the interaction and reported students with lower self-efficacy had higher test anxiety. In line with this, Jing (2007) and Muris (2002) reported negative correlations

between self-efficacy and test anxiety and self-efficacy and trait anxiety respectively. Conversely, Koksal (2009) concluded, whilst students were self-efficacious about their learning of biology material, they considered themselves anxious when under a testing situation. Nelson and Knight (2010) assert self-efficacy enhances coping, however they did not measure self-efficacy directly, rather they used a measure of optimism.

Cassady (2002) asserts test anxiety affects performance through low levels of self-efficacy and that low levels of self-efficacy are developed in response to failure (Bandura, 1989). Cassady and Johnson (2004) found students with high levels of test anxiety had lower self-efficacy. Although this was not directly measured, rather it was demonstrated through their perceptions of tests as threatening and their feelings of helplessness in relation to controlling their performance outcomes. Thus, students set low goals for themselves and developed avoidance behaviours, deeming them less likely to adopt useful test preparation strategies or coping techniques. Cassidy and Johnson (2004) recommends targeting students' affective orientations in addition to helping them develop test preparation skills and coping techniques.

The aims of the current study

According to Putwain et al., (2010) and Putwain and Daly (2013) imprinted metacognitions, beliefs and learned knowledge can heighten the appraisal of threat; e.g., perception of low competence could lead to the anticipation of negative outcomes in evaluative circumstances, and a belief that worrying is an effective coping mechanism could result in further anxiety, thus interfering with cognitions and affecting academic performance. Numerous studies have asserted that perceptions of low competence is associated with higher test anxiety and that high levels of perceived competence can provide some protection from it (Chamorro-Premuzic et al., 2008; Van Yperen, 2007). In the same way, the current study proposes that self-efficacy beliefs may play a role in test anxiety, specifically that self-efficacy may counter test-anxious thoughts, therefore taking a performance protective role. Further, using a multidimensional test anxiety measure, rather than treating it as a unidimensional variable (i.e., test anxiety total), may highlight not only how different aspects are related to academic performance but also how each facet is affected by self-efficacy beliefs.

This research aims to bridge the gap between general self-efficacy and specific self-efficacy by using a domain general measure and a domain specific measure. The specific

measure will not be restricted to one module; rather it is designed to assess all academic criteria; whereas the general measure will determine whether students with general self-efficacy also have academic self-efficacy or whether academic self-efficacy is independent of general self-efficacy. The academic self-efficacy measure corresponds to the outcome with which it is compared (Zimmerman , 2000).

In light of call from Spada, Nikcevic, Moneta and Irenson (2006) this study adopts a longitudinal approach to data, collecting grades over a three year period. The current study brings together both the specific; individual module coursework and exam grades, and cumulative marks including overall module marks and yearly averages. In addition to using a good variety of academic performance indicators, the current study employs both a validated general measure of self-efficacy and an academically specific measure. This will ensure that nothing is missed and will establish whether an academic measure is more appropriate to measure performance outcome. Self-efficacy is thought to vary across domains (Bandura, 2012) therefore it may not be the case that individuals who are high on general self-efficacy are high on academic self-efficacy and vice versa; the current study will account for these possible differences.

Based on previous findings the following hypotheses have been formed:

H_1. Test anxiety, in particular worry and test irrelevant thoughts will be associated to academic performance.

H_2. Bodily symptoms and Tension will be negatively associated with academic performance.

H_3. Academic self-efficacy will be positively associated with academic performance.

H_4. General self-efficacy will be positively associated to academic performance but to a lesser extent that academic self-efficacy.

H_5. General self-efficacy will only be moderately associated with academic self-efficacy suggesting commonality and uniqueness between the two.

H_6. Test anxiety will be negatively associated with Academic and general self-effiacy

H_7. Higher levels of academic self-efficacy will be associated with lower level of test anxiety.

2.2 Method

Design

This study is a quantitative, cross-sectional (with archival longitudinal performance data) survey design, which uses self-report measures which are aligned with recent academic performance indicators. The Independent Variables are the self-report measures. The Criterion Variables are the indices of academic performance including overall Grade Points Average, yearly averages and module averages. As in the previous chapter, data analysis includes descriptive and inferential statistics and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled.

Participants

The present sample comprised *N* = 229 (100 Level 4; 129 level 5) participants. A total of 393 participants were originally recruited but many were removed due to non-random missing data i.e., incomplete self-reports or missing academic performance results. The majority of the participants were female (88.4%) aged between 18–32 years (M = 19 years) for the level 5 cohort, and female (84%) aged between 19–32 years (M = 21 years) for the level 4 cohort. An opportunity sample of Combined Honours and Applied Psychology students took part. The students' academic performance was combined with current self-reports to facilitate testing the association of test anxiety, general and academic self-efficacy with academic performance. As in chapter 1, it is important to note that the survey measures are self-report and based on perceptions of self rather than actual abilities; however association with performance indicators negates the potential problem of shared method variance (Tabachnick & Fidell, 2007). The outcome of the measures was used to assess student grades (specific modules and averages) collected at the end of each academic year. Self-report data were collected from each student only once and were analysed in relation to module grades and averages.

The General Self-efficacy Scale (Schwarzer & Jerusalem, 1992).

This is a 10-item scale with items including 'I can always manage to solve difficult problems if I try hard enough' and 'I can remain calm when facing difficulties because I can rely on my coping abilities'. Response format is on a 4-point scale (1 = not at all true to 4= exactly true). All items are written positively with higher scores representing higher

general self-efficacy. The measure has demonstrated excellent internal consistency and reliability and this is supported in the current study (α =.89).

The Academic Self-efficacy Scale (McIlroy & Bunting, 2002).

This is a 10-item scale with items ranging from 'I am confident that I can achieve good exam results if I really put my mind to it' to 'I fear that I may do poorly in my end-of-semester exams'. Participants responded on a 7-point Likert format ranging from 1 (very strongly agree) to 7 (very strongly disagree). The measure was constructed to reflect self-efficacy beliefs and behaviours exclusively within the domain of academia. Seven of the ten items are reverse scored and the higher scores represented higher levels of perceived competence. The measure has demonstrated excellent internal consistency, with a high reliability of 0.87, and a robust predictive validity of r = 0.37 in relation to academic performance (McIlroy et al., 2000). Cronbach's alpha demonstrated good internal consistency in the present sample (α =.89).

The Revised Test Anxiety Scale (Benson & El-Zahhar, 1994).

This is a 20-item measure in which items (e.g. "during exams I find myself thinking about the consequences of failing'' or "I am anxious about exams") are rated on a 7-point Likert format, ranging from 1 (strongly agree) to 7 (strongly disagree). It provides scores on four subscales including Worry, Tension, Test Irrelevant Thinking and Bodily Symptoms. Higher scores represent test anxious responses, and the measure has demonstrated high reliability (α = 0.90 in this study), consistent predictive validity and factorial invariance across academic subjects (Benson & El-Zahhar, 1994; McIlroy, Bunting & Adamson, 2000).

Measures of academic performance.

The programme of study is accredited by the British Psychological Society, and so the academic content follows their guidelines for core material. Assessment methods involve a mixture of coursework and exams. Exams are typically of 2 hours duration with a requirement to answer 2 questions with a choice from 6 chiefly unseen questions; with a number of modules offering a seen question. Coursework is based on a set essay title of typically 2, 000 words covering a literature review with a set deadline for submission. Psychology students are also required to do practical reports using statistical analysis as part of their coursework assessment to test a full range of research-related skills. The

minimum standard required for a pass is 40% in both coursework and tests. Module specific grades, averages and cumulative Grade Point Averages for levels 4, 5 and 6 (including final degree classification) for the level 5 cohort, and levels 4 and 5 for the level 4 cohort, were collected from the School database. Degree classification is comprised of 25% weighting from level 5 and 75% weighting from level 6, and students may be compensated on 20% of a given year (24 credits) if they have an average of 45% and have not failed below 30%. As described above each student was assessed by a mixture of coursework and exam. Grade Point Average is recorded as the mean scores across modules.

Information on the procedure and ethical considerations are presented in chapter 1.

Statistical Analyses

All data were tested for assumptions in relation to normality, reliability and the potential for type 1 errors was accounted for. Correlation and multiple regression analysis were used to test the hypotheses and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled, and levels of skewness and kurtosis were consistently low (typically < 1.96). Students who did not sit *any* examinations or complete any coursework were excluded from the analysis as a central aim was to relate the self-report measures to academic achievement. Students that completed part of their assessment however, were included.

Firstly, the data were screened in order to examine distribution, means, standard deviations, skewness and kurtosis (range: -.112 to -.707 and .151 to .661) for skewness and kurtosis respectively. The study's hypotheses were tested at bivariate level through correlations analyses, and at multivariate level through Multiple Regression. Multiple regression analyses were conducted based on the significant associations from the correlation analysis. The multiple regression analyses facilitated further refinement of the study's hypotheses and allowed for eliciting the combined variance from the self-report measures and the identification of the most robust associates of academic performance. Further, path analyses were used to explore direct and indirect effects, proximal and distal effects, and to ascertain the mediation effects of test anxiety and self-efficacy on academic performance. Additionally, to determine whether academic self-efficacy had an effect on test anxiety, academic self-efficacy was divided into 3 levels (low, medium and high) and a one-way ANOVA was conducted for each level.

2.3 Results

Table 2.1: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for the Level 5 Cohort

	GSE	ASE	Worry	Tension	Bod Sym	Test Irr Thgts	TA TOT
Mean	30.55	48.76	24.98	26.70	15.30	17.11	84.09
SD	3.7	7.28	7.18	6.88	7.32	6.28	19.98
SK	.080	.127	-.031	-.813	.407	-.209	.301
Kurtosis	.299	.055	-.168	-.242	-.591	-.767	-.471
Alpha	.77	.74	.80	.92	.85	.87	.89
Norms/mid points	25	40	24	20	20	16	80

Key: GSE = General Self-Efficacy ASE = Academic Self-Efficacy TA TOT = Test Anxiety Total/Global Score (TA subscales include: Worry, Tension, Bod Sym = Bodily Symptoms and Test Irr Thgts = Test Irrelevant Thoughts).

Table 2.2: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for the Level 4 Cohort

	GSE	ASE	Worry	Tension	Bod Sym	Test Irr Thgts	TA TOT
Mean	29.81	46.73	28.61	28.23	16.66	18.09	91.59
SD	3.6	7.86	7.11	5.97	7.59	6.42	21.07
SK	-.27	.27	-.263	-.948	.165	-.514	-.309
Kurtosis	1.34	.86	-.328	.858	-.647	-.667	.012
Alpha	.82	.83	.86	.91	.90	.93	.93
Norms/mid points	25	40	24	20	20	16	80

Key - table 1

Tables 2.1 and 2.2 illustrate the means for General Self-efficacy and Academic Self-efficacy are both above the midpoint (25 for general self-efficacy and 40 for academic self-efficacy) for both cohorts. This indicates that most students are generally and academically self-efficacious. There is a moderate spread of scores for general self-efficacy and a better spread for academic self-efficacy. Test anxiety total score is above the midpoint (80) for both cohorts but particularly higher for the level 4 group suggesting that these students experience high levels of test anxiety (which might be expected at a lower level, with students having less experience of assessment at tertiary level). There is a large spread of scores however, suggesting good variance. This is reflected in the subscales with worry and test irrelevant thoughts both being above the midpoint (24 and 16 respectively); this shows that students are prone to worry and somewhat likely to experience test irrelevant thoughts. This is particularly the case for the level 4 cohort; the level 5 cohort are only just above the midpoint for both worry and slightly more for test irrelevant thoughts. In both cohorts lower scores are experienced for bodily symptoms but the means do show that students are vulnerable to tension. The quality of the data is demonstrated with low levels of skewness and kurtosis (range: -.031 to -.948 and .055 – .858 for skewness and kurtosis respectively). All measures have sound reliabilities (range .74 - .93).

Table 2.3: Mean scores of participants for higher, moderate and lower Academic Self-efficacy on Test Anxiety and its subcomponents (L5)

ASE	TA(Tot)	Worry	TIRT	TEN	BS
LOW	89.79	27.29	19.08	28.23	15.17
MED	84.55	24.48	17.57	26.42	16.06
HIGH	77.76	23.09	14.66	25.39	14.66
TOT	84.09	24.98	17.11	26.70	15.30
Norms/mid point	80	24	16	20	20

Key: ASE = Academic Self-Efficacy TA(Tot) = Test anxiety Total (Global Score) Worry = Worry TIRT = Test Irrelevant Thoughts TEN = Tension BS = Bodily Symptoms

Table 2.4: One-way ANOVA showing the impact of ASE on TA and its subcomponents (L5)

	Sum of Squares	Df	Mean Square	F	Sig
TA(Tot)	2436.38	2	1218.19	3.186	.046
Worry	307.93	2	153.96	3.113	.049
TIRT	347.11	2	173.55	4.717	.011
TENS	138.94	2	69.47	1.480	.233
BS	32.84	2	16.42	.302	.740

Key: tables 1 and 3

Table 2.3 demonstrates the means for test anxiety and its subcomponents on three levels of academic self-efficacy (1), medium (2) and high (3) for the level 5 cohort. As can be seen from table 3 there is a large difference between low and high self-efficacy and test anxiety suggesting that individual's with low self-efficacy experience high levels of test anxiety; therefore those with high self-efficacy have low test anxiety. This tentatively indicates that high levels of academic self-efficacy may lessen the effects of test anxiety. Further, there is no problem with homogeneity of variance as all are $p>.05$.

Table 2.4 is an analysis of variance showing the difference between groups (academic self-efficacy and test anxiety); those with lower self-efficacy have higher test anxiety (total) ($F(2) = 3.186$, p.046); worry ($F(2) = 3.113$, p.049) and test irrelevant thoughts ($F(2) = 4.717$, p.011). Neither bodily symptoms nor tension are significant.

Further, multiple comparisons revealed significant differences between low and high academic self-efficacy but not between low and medium or medium and high on test anxiety total and the two cognitive components (MD = 12.04, $p<.05$; 4.20, $p<.05$; 4.49, $p<.01$ for test anxiety total, worry and test irrelevant thoughts respectively).

Table 2.5: Mean scores of participants for higher, moderate and lower Academic Self-efficacy on Test Anxiety and its subcomponents (L4)

ASE	TA(Tot)	Worry	TIRT	TENSION	BS
LOW	100.58	31.72	19.98	29.35	19.53
MED	88.37	28.02	17.20	27.66	15.39
HIGH	85.93	26.18	17.00	27.69	15.07
TOT	91.59	28.61	18.09	28.23	16.66
Norms/mid point	80	24	16	20	20

Key: table 3

Table 2.6: One-way ANOVA showing influence of ASE on TA and its subcomponents (L4)

	Sum of Squares	Df	Mean Square	F	Sig
TA(Tot)	5342.44	2	2671.22	6.537	.002
Worry	696.41	2	348.20	7.588	.001
TIRT	232.59	2	116.29	2.905	.058
TENS	80.39	2	40.19	1.130	.326
BS	535.73	2	267.86	4.942	.009

Key – table 3

Table 2.5 demonstrates the means for test anxiety and its subcomponents on low (1), medium (2) and high (3) academic self-efficacy for the level 4 cohort. As can be seen from table 5 there is an extreme difference between low and high self-efficacy on test anxiety suggesting that individual's with low self-efficacy experience high levels of test anxiety; therefore those with high self-efficacy have low test anxiety. This is a very similar pattern to the level 5 cohort, with the addition of bodily symptoms; as mentioned earlier (see tables 1 and 2) this cohort (level 4) score higher on the worry component than the level 5 cohort. This tentatively indicates that high levels of academic self-efficacy may lessen the effects of test anxiety total, the cognitive facets (in particular worry) and bodily symptoms; there are no significant differences for the Tension subcomponent. Further there is no problem with homogeneity of variance as all $p>.05$, indicating that all groups are equal.

Table 2.6 is an analysis of variance showing the difference between groups (academic self-efficacy and test anxiety); those with lower self-efficacy have higher test anxiety (total) ($F(2) = 6.537$, p.002); worry ($F(2) = 7.588$, p.001); test irrelevant thoughts (on a one-tailed basis) ($F(2) = 2.905$, p.058); and higher bodily symptoms: ($F(2) = 4.942$, p.009).

Further, multiple comparisons revealed significant differences between low and medium academic self-efficacy, low and high academic self-efficacy, but no difference between moderate and high academic self-efficacy on all test anxiety components, except tension. For test anxiety total (MD = 12.22, $p<.05$; MD = 14.65, $p<.05$), for worry (MD = .370, $p<.05$; MD = 5.54, $p<.01$) and for bodily symptoms (MD = 4.15, $p<.05$; MD = 4.47, $p<.05$) for low – medium and low – high test anxiety respectively.

Table 2.7: Correlation Table - Level 5 Cohort

	INTRO	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
SOCPSY(2)	.01																				
HMPSY(3)	.38**	.05																			
DEVPSY(4)	.15	.06	.33**																		
L & Cog(5)	.48**.	.22*	.47**	.39**																	
INTRO RM(6)	.27**	.20	.19	.17	.41**																
RMII(7)	.41**	.29**	.43**	.41**	.58**	.29**															
BCD(8)	.26**	.23*	.42**	.30**	.55**	.30**	.60**														
SPID(9)	.28**	.26**	.27**	.16	.39**	.34**	.45**	.62**													
ABN PSY(10)	.40**	.35**	.31**	.29**	.56**	.29**	.60**	.46**	.35**												
PSY APP(11)	.25*	.27**	.20*	.16	.33**	.19	.46**	.40**	.26**	.40**											
Diss(12)	.31**	.32**	.31**	.35**	.56**	.41**	.58**	.46**	.44**	.45**	.47**										
AV4(13)	.54**	.38**	.58**	.54**	.88**	.53**	.69**	.61**	.45**	.62**	.38**	.65**									
AV5(14)	.11	.33**	.36**	.21*	.45**	.25*	.48**	.49**	.48**	.44**	.42**	.38**	.47**								
AV6(15)	.38**	.43**	.29**	.33**	.61**	.40**	.68**	.59**	.49**	.61**	.56**	.81**	.71**	.48**							
GSE(16)	.03	.07	-.05	.07	.04	.01	.02	-.05	-.10	.18	.03	.07	.06	.04	-.04						
ASE(17)	.24*	.21*	.14	.19	.22*	.19	.19	.15	.18	.22*	.07	.26**	.31**	.20*	.22*	.37**					
TA(t)(18)	-.28**	-.06	-.14	-.00	-.15	-.19	-.05	-.05	-.23*	-.10	.13	.01	-.19	-.06	.10	-.13	-.23*				
WOR(19)	-.25*	-.14	-.18	-.08	-.17	-.19	-.04	-.07	-.25*	-.10	.16	-.01	-.23*	-.04	.10	-.10	-.27**	.83**			
TENS(20)	-.13	-.04	-.10	.15	-.08	-.14	.02	-.05	-.16	-.06	.10	.08	-.05	-.08	.07	-.09	-.10	.81**	.65**		
BS(21)	-.20*	.06	-.00	.05	-.00	-.00	.03	.03	-.05	-.07	.15	.11	-.03	-.05	.08	-.10	-.05	.65**	.26**	.45**	
TIRT(22)	.23*	-.04	-.15	-.14	.21*	-.22*	-.17	-.06	-.20*	-.04	-.07	-.18	-.25*	-.10	-.11	-.08	-.36**	.59**	.49**	.20*	.09

Table 2.7 Key: *p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed). *p<.05 level (two-tailed) **p<.01 level (two-tailed)

Key: 1 INTRO= Introduction to Psychology 2 SOC PSY = Social Psychology 3 HM PSY = History of Modern Psychology 4 DEV PSY= Developmental Psychology 5 L & Cog = Learning and Cognition: Styles & Strategies 6 INTRO RM = Introduction to Research Methods in Psychology 7 RMII = Research Methods II 8 BCD PSY= Biological Cognitive & Developmental Psychology 9 SPID = Social Psychology and Individual Differences 10 ABN PSY = Psychology of Abnormal Behaviour 11 PSY APP= Psychology in Application II 12 = Dissertation 13 AV4= Level 4 Average 14 AV5 = Level 5 Average 15 AV6 = Level 6 Average 16 GSE = General Self-efficacy 17 ASE = Academic Self-efficacy 18 TA(t)= Test Anxiety Total 19 WOR = Worry 20 TENS = Tension 21 BS = Bodily Symptoms 22 TIRT = Test Irrelevant Thoughts

Table 2.7 illustrates associations between leveb l 4 modules are mixed with some modules uncorrelated and some showing positive low to moderate associations (r = .22 to .39); this indicates that there is a good degree of distinction between modules at level 4. In contrast all level 5 modules are associated with one another (r = .23 to .58) showing that modules at level 5 are more closely linked than at level 4, perhaps due to a tighter range of modules and a narrower expectation in relation to standards. It can be seen that level 4 average is associated with level 5 and level 6 (*rs* = .47; .71, *ps* <.01) and level 5 average is associated with level 6 (r = .48, p<.01). It is interesting to note that students who do well at level 4 seem to do well at level 6; however there is fluctuation of grades as students' transition between levels.

General self-efficacy does not show any associations to performance here; however the more academically specific measure (academic self-efficacy) shows an association with three of the five modules in level 4 and one module at level 5. Academic self-efficacy is also associated with the dissertation module at level six (level 6) and to average mark at all levels (4, 5 and 6) so in all there are nine associations for academic self-efficacy and performance (*rs* = .20 to .31, *ps*<.05 to <.01). Consistent with hypothesis 3, this illustrates that academic self-efficacy is associated with academic performance at all levels; whereas general self-effiacy is not.

Hypothesis 1 and 2 have been partially met; there are mixed associations between test anxiety and academic performance, with worry being negatively associated with one level 4 module (r = .28, p<.01) and one level 5 module (r = .23, p<.05). It is not associated with the dissertation module at level 6 but this may be because the dissertation is an on-going project (year long), therefore worry may be negated by having more time and more tutor contact, reassurance and supervision. Worry is also associated with level 4 average but not level 5 or level 6. Bodily symptoms and test irrelevant thoughts are both negatively associated with Research Methods (coursework 1) and test irrelevant thoughts is also negatively associated with Research Methods average mark, and Biological, Social and Developmental (coursework 1 and exam). Understandably test irrelevant thoughts is therefore associated with level 4 average but does not show associations with average marks at levels 5 or 6.

With regard to the self-report measures academic self-efficacy is moderately associated with general self-efficacy (r = .37, p<.01) indicating some overlap; however given the

associations with academic performance, academic self-efficacy is clearly tapping into different aspects (academic) of self-efficacy, whereas the general measure, in this instance, is missing these vital associations. In accordance with hypotheses 5 and 6, general and academic self-efficacy are negatively associated with test anxiety and its components, as would be expected with self-efficacy being a positive and test anxiety being a negative construct (*rs* = -.23 to -.36, *ps*<.05 to <.01) with some non-significant associations but still in the expected direction. However, for the level 5 cohort academic self-efficacy is only significantly negatively associated with the cognitive components; whilst there is no significance for general self-efficacy. Test anxiety total and its components are generally associated with each other (*rs* = .26 to .83, *ps*<.01), however there is a clear distinction between the cognitive components (worry and test irrelevant thoughts) and bodily components (bodily and tension) as shown by the lack of association between bodily symptoms and test irrelevant thoughts (r = .094) and low association between bodily symptoms and worry (r = .201); whereas tension and bodily symptoms are highly correlated (r = .451) as are worry and test irrelevant thoughts (r = .487). Nonetheless, they are clearly distinct cognitive features.

Table 2.8: Correlation table - level 4 cohort

	1(RM1)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
DEV SOC PSY(2)	.58**																
LCB PSY(3)	.58**	.56**															
CON ISS PSY(4)	.44**	.48**	.57**														
RMII(5)	.46**	.55*	.53**	.49**													
BCD (6)	.55**	.42**	.54**	.49**	.61**												
SPID(7)	.52**	.44**	.58**	.44**	.61**	.55**											
ABN PSY(8)	.60**	.58**	.58**	.44**	.51**	.39**	.47**										
PSY APP(9)	.35**	.29**	.38**	.35**	.51**	.41**	.44**	.33**									
AVL4(10)	.81**	.81**	.84**	.76**	.69**	.63**	.62**	.68**	.44**								
AVL5(11)	.67**	.58**	.65**	.57**	.85**	.77**	.78**	.65**	.76**	.77*							
GSE(12)	.16	.22*	.24**	.27**	.26**	.23**	.29**	.22**	.20*	.28**	.31**						
ASE(13)	.10	.18*	.26**	.27**	.27**	.19**	.21**	.24**	.28**	.24**	.31**	.41**					
TA(t)(14)	-.07	-.17	-.14	-.19*	-.05	-.05	-.03	.22**	-.06	-.18*	-.10	-.24**	-.35**				
WOR(15)	-.09	-.20*	-.22*	-.24**	-.12	-.11	-.09	-.30**	-.10	-.23**	-.18*	-.25**	-.40**	.87**			
TENS(16)	-.07	-.11	-.08	-.02	.01	-.07	-.03	-.14	.03	-.09	-.04	-.17	-.20*	.82**	.70**		
BS(17)	-.06	-.15	-.05	-.15	.02	.03	.08	-.15	-.02	-.12	-.00	-.19*	-.25**	.79**	.55**	.61**	
TIRT(18)	.01	-.06	-.08	-.17	.09	-.01	-.07	-.07	-.10	-.09	-.10	-.12	-.22**	.63**	.48**	.29**	.22*

*p<.05 level (two-tailed) **p<.01 level (two-tailed) Key: 1=Research Methods I 2= Developmental & Social Psychology 3= Learning, Cognitive and Biological Psychology 4 = Conceptual Issues in Psychology 5 = Research Methods II 6 = Biological Cognitive & Developmental Psychology 7 = Social Psychology and Individual Differences 8= Psychology of Abnormal Behaviour 9 = Psychology in Application II 10 = Level 4 Average 11= Level 5 Average 12 = General Self-efficacy 13 = Academic Self-efficacy 14 = Test Anxiety Total 15 = Worry 16 = Tension 17 = Bodily Symptoms 18 = Test Irrelevant Thoughts

Table 2.8 illustrates that the level 4 academic performance indicators are all moderately associated with one another (range: *rs* = .48 to .57, *ps* <.01); this is in contrast to the level 5 cohort; this could be because the programme has been restructured and 12 credit modules have been replaced by larger 24 credit modules. Level 5 academic performance indicators are also all associated with one another (r*s* = .33 to .61, *ps* <.01). It can also be seen, as with the previous cohort, that level 4 is associated with the next level (level 5), with associations between level 4 and level 5 ranging from (*rs* = .29 to .58, *ps* <.01).

In contrast to the level 5 cohort, general self-efficacy and academic self-efficacy correlated with all level 4 and 5 modules (*rs* = .22 to .29 and .18 to .28, *ps* <.05 to <.01), and as would be expected from this with level 4 and level 5 averages (*rs* = .28 to .31 and .24 to .31, *ps* <.05 to <.01) for academic self-efficacy and general self-efficacy respectively. Again associations between the two constructs (r = .408, p<.01) is only moderate showing that each construct is tapping into different aspect of self-efficacy consistent with H4.

Similar to the level 5 cohort, test anxiety and academic performance has mixed associations with worry being negatively associated with all level 4 modules (*rs* = -.20, p<.05 to -.24, p<.01) but with only one module at level 5 (r = -.30, p<.01); however, worry is negatively associated with level 4 and level 5 average marks (r = -.23, p<.01; r = -.18, p<.05) showing that worry is a concern for this cohort. These findings are consistent with the means showing that this cohort is high on worry; however the effects may be tempered due to high levels of self-efficacy. Interestingly, test irrelevant thoughts does not appear to be associated with any of the academic performance indicators despite this cohort being higher than the level 5 cohort on test irrelevant thoughts.

The self-report measures are associated in the expected direction but there are some differences between the two cohorts, with general self-efficacy only being significantly associated with test anxiety total, and with worry and academic self-efficacy being significantly associated with both the cognitive and emotionality components; in addition the relationships are much stronger than with general self-efficacy. Test anxiety components take the same form as the level 5 cohort but with stronger correlations between them.

Regression Analyses

Table 2.9: Regression Analyses (L5 Cohort)

	L4AV (model 1)			L5AV (model 2)			L6AV (model 3)		
	B	SE	B	B	SE	β	B	SE	β
ASE	.222	.083	.265**	.219	.113	.201*(1t)	.198	.083	.243*
Worry	-.137	.084	-.161	.016	.114	.014	.059	.085	.071
F(2,97)=	6.600**			1.976			2.808*(1t)		
AdjR² =	.10			.04			.04		

One-tailed (1t) here is .055 so close to two-tailed significance

Table 2.9 indicates that academic self-efficacy is the most robust contributing factor to academic performance in levels 4, 5 and 6 accounting for 10% and 4% respectively. Worry is not significant; this may be because academic self-efficacy negates the effects of test anxiety, in this instance worry. Overall, models 1 and 3 are statistically significant.

Table 2.10: Regression Analyses (L4 Cohort)

	L4 AV (model 1)			L5 AV (model 2)		
	B	SE	B	B	SE	β
GSE	.324	.59	.196*	.346	.151	.210*
ASE	.088	.08	.108	.166	.076	.211*
Worry	-.119	.08	-.137	-.036	.079	-.042
F(3,125) =	5.236**			6.651***		
Adj R² =	.09			.11		

Here one-tailed is .06.

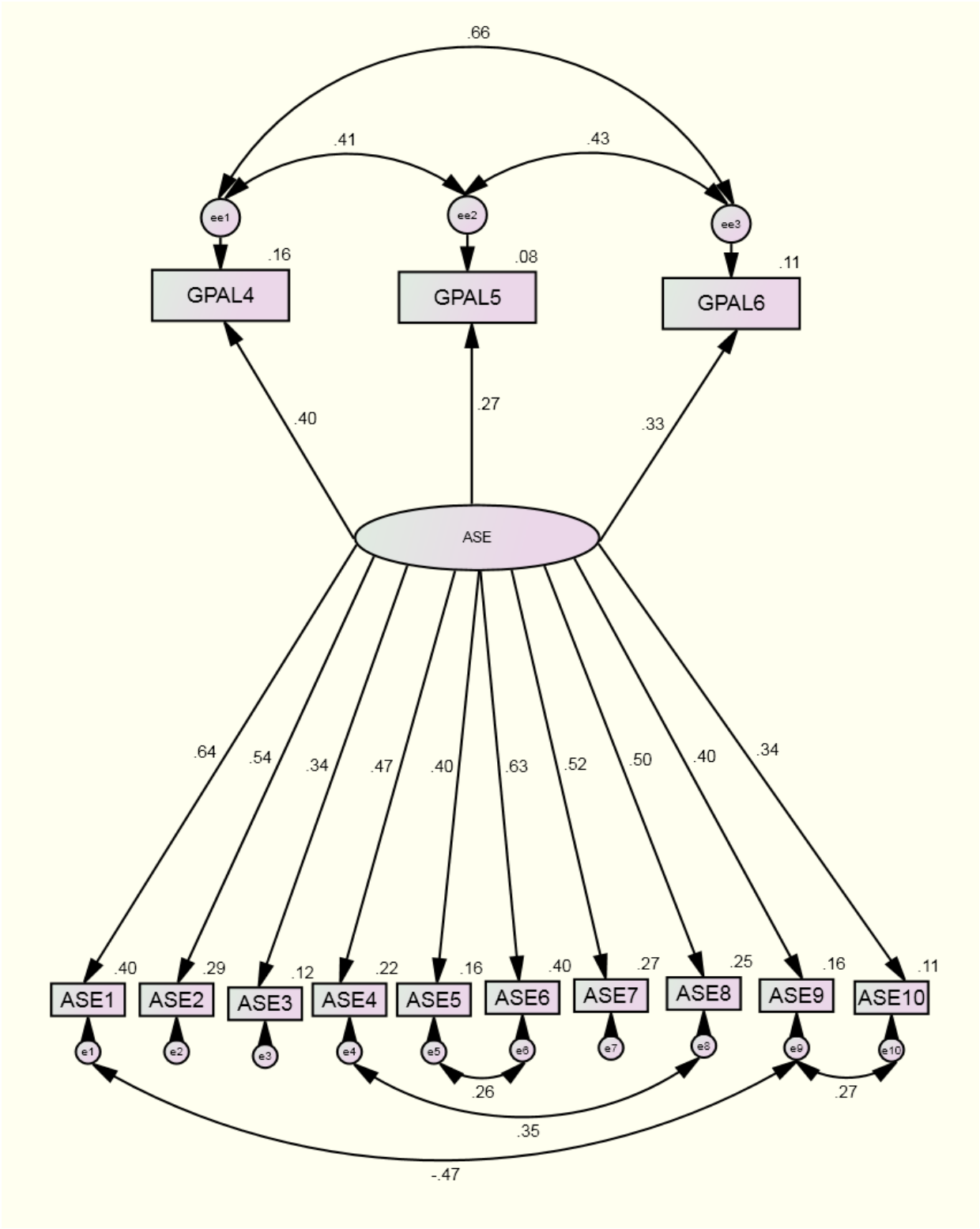
Table 2.10 illustrates that general self-efficacy is the most robust predictor of academic performance at level 4 but not at level 5; whilst general self-efficacy is still a highly important contributing factor, academic self-efficacy comes into play. Perhaps academic self-efficacy comes into being when academic work becomes more difficult. General self-efficacy may carry through the first level. The two models are significant and combined general self-efficacy, academic self-efficacy and worry account for 9% of the variance in level 4 average, with most of the variance coming from general self-efficacy. For level 5 average the combined factors account for 11% of the variance in academic performance,

with most of the variance coming from academic self-efficacy, followed by general self-efficacy, with worry being non-significant.

Modelling

Modelling was conducted following the regression analyses on the basis that measurement error is controlled which may increase the level of variance demonstrated; regression analysis does not account for measurement error, thus this may reduce variance. The variables used in the models echo those used in the regression analyses and were chosen on the basis of their significant correlations. Model fit indices are provided in the appendix 6.

Figure 2.1: Confirmatory Factor Analysis output diagram: academic self-efficacy associated with levels 4, 5 and 6 Grade Point Average (level 5 Cohort).

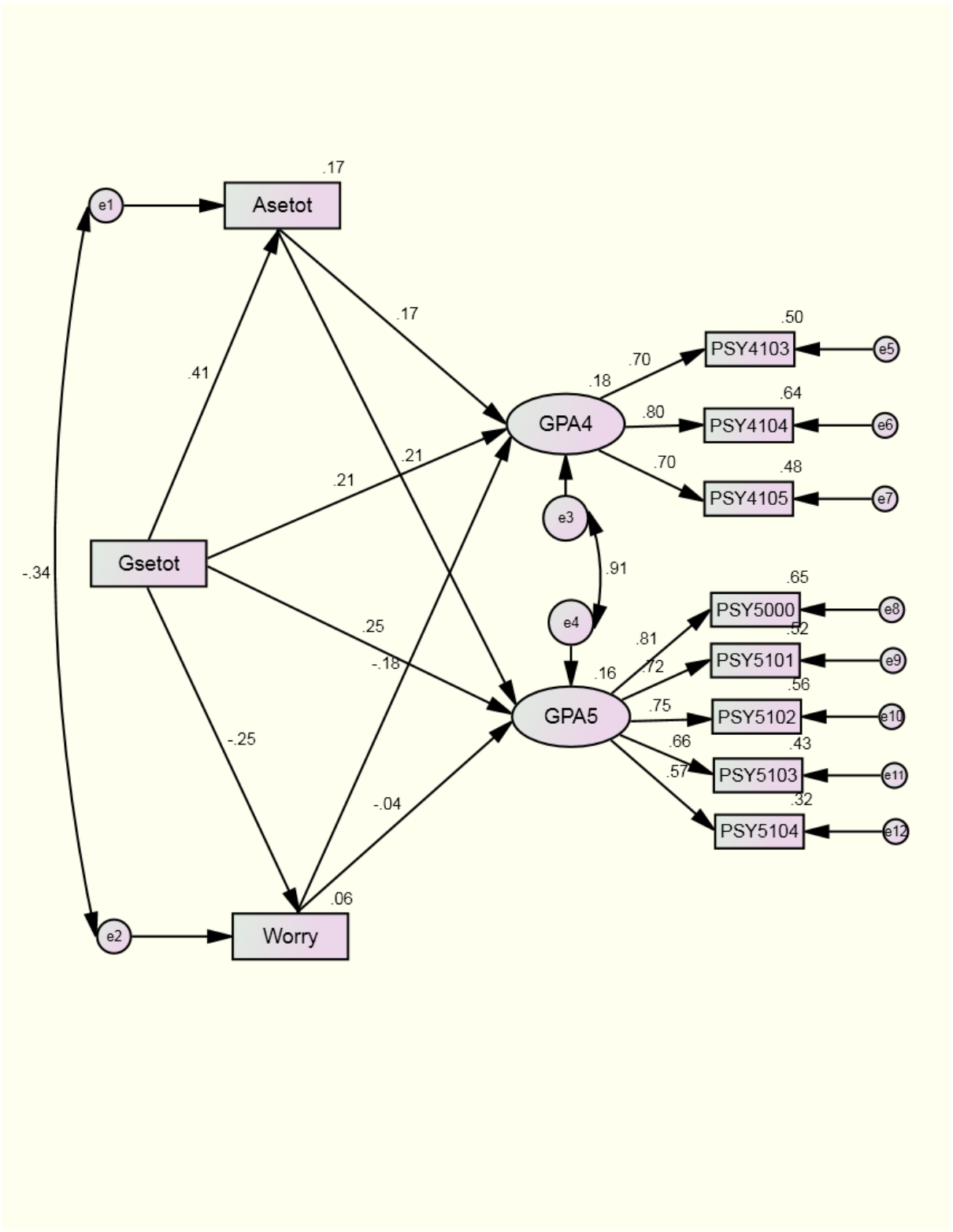


The factor structure presented in figure 2.1 shows the associations between academic self-efficacy and levels, 4, 5 and 6 grade point averages. All factor loadings were significant (range .34 to .64) and no cross-factor loadings were suggested by the modification index; therefore all items loaded on to their appropriate factors.

The factor model illustrates significant variance between academic self-efficacy and all three level averages (16%, 8% and 11% for Average 4, 5 and 6 respectively) clearly demonstrating that academic self-efficacy impacts on Grade Point Average at each level of study. The advantage of this approach is that the levels of variance are enhanced when measurement error is controlled for; removing worry and controlling for measurement error has increased the variance of the regression analisis by 6%, 4% and 7% for Grade Point Average 4, 5 and 6 respectively.

The CFA model fit indices were at a satisfactory level indicating a good model fit as shown by the following criteria: RMSEA = .034 (Confidence Intervals = .00 to .07); CFI = .98; TLI = .97; Chi-square was not however statistically significant ($\chi^2 = 64.6$, $p < .05$, df = 58), and the SRMR was acceptable at .066. However, a series of correlated errors were required suggesting common content between pairs of variables that may be uniquely linked to academic self-efficacy (Joreskog, 1994), but these are sometimes explained by the idiosyncrasies of particular samples (Byrne, 2010). The adopted process avoided over fitting the model by setting the modification index to 10.

Figure 2.2: Path analysis with confirmatory factor analysis (CFA) output diagram: general self-efficacy, academic self-efficacy and worry component of the RTAS associated with levels 4 and 5 Average (L4 Cohort).

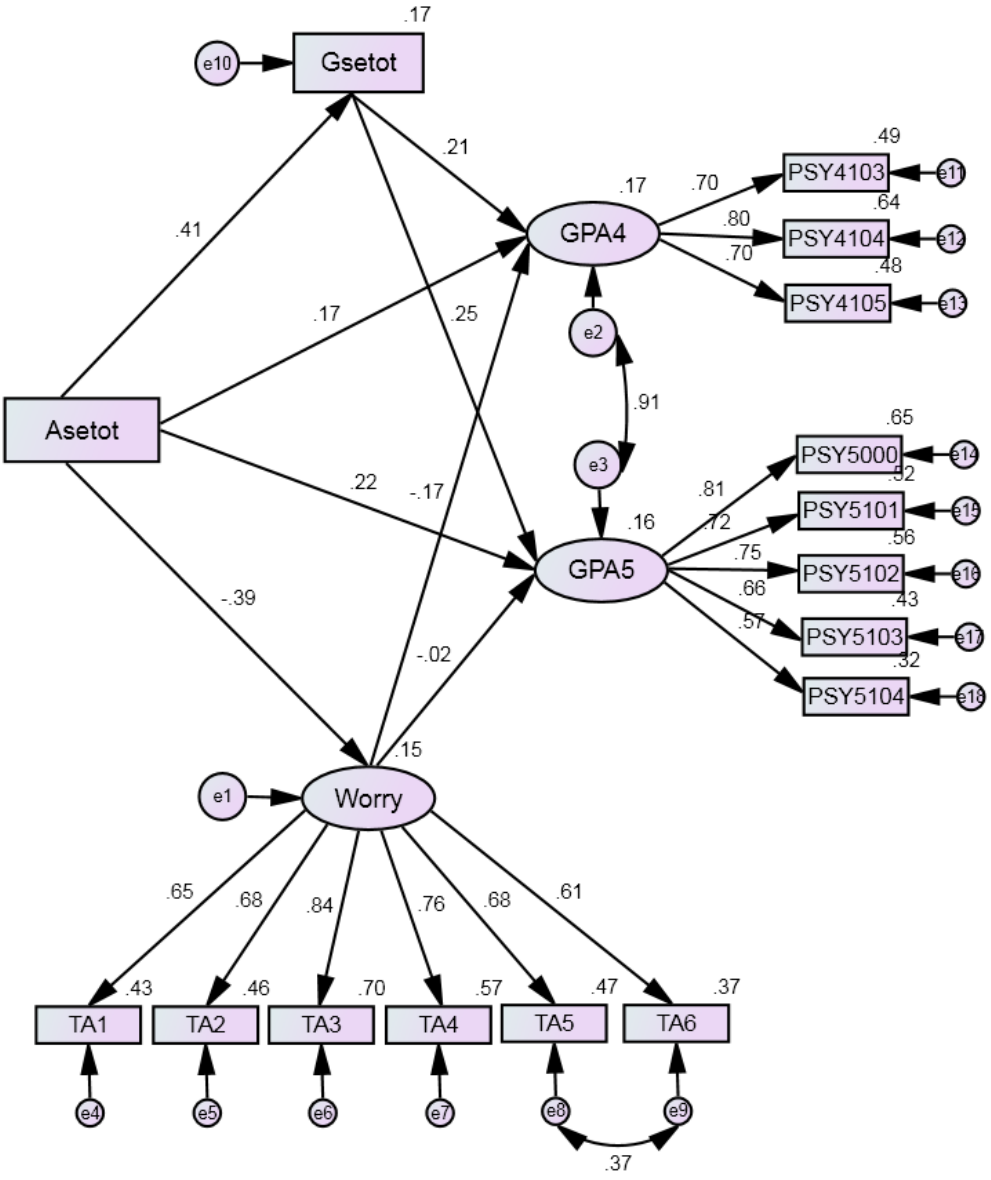


The factor structure presented in figure 2.2 shows associations between academic self-efficacy, general self-efficacy, worry and average marks for levels 4 and 5. All factor loadings were highly significant (range .70 to .80 and .57 to .81 for level 4 average and level 5 average respectively). No cross-factor loadings were suggested by the modification index indicating all items loaded on to their appropriate factors.

In the expected direction the model illustrates significant variance between academic self-efficacy, general self-efficacy and performance in the positive direction; whereas there is a significant negative association between Worry and performance (level 4 average). The three predictors account for 18% of the variance in level 4 average and 16% in level 5 average. Only a couple of correlated residuals were required (as suggested by the modification indices) to improve the model fit, and the model is justified by the clearly non-trivial effect sizes of 16% and 18% which has increased from 11% and 9% accounted for in the regression analysis (table 10). Bootstrapping revealed one significant indirect effect (.114); this was for general self-efficacy through academic self-efficacy to level 4 average and the effect fell within the confidence intervals (CI = .02 to .24, $p<.01$).

The model fit indices were highly acceptable as shown by the following criteria: RMSEA = .034 (Confidence Intervals = .00 to .074); CFI = .989; TLI = .983; Chi-square was also acceptable ($\chi^2 = 42.6$, df = 37, $p > .05$) and the SRMR was .0437.

Figure 2.3: Path analysis with confirmatory factor analysis (CFA) output diagram: General self-efficacy, Academic Self-efficacy and Worry component of the RTAS associated with levels 4 and 5 Average (L4 Cohort)

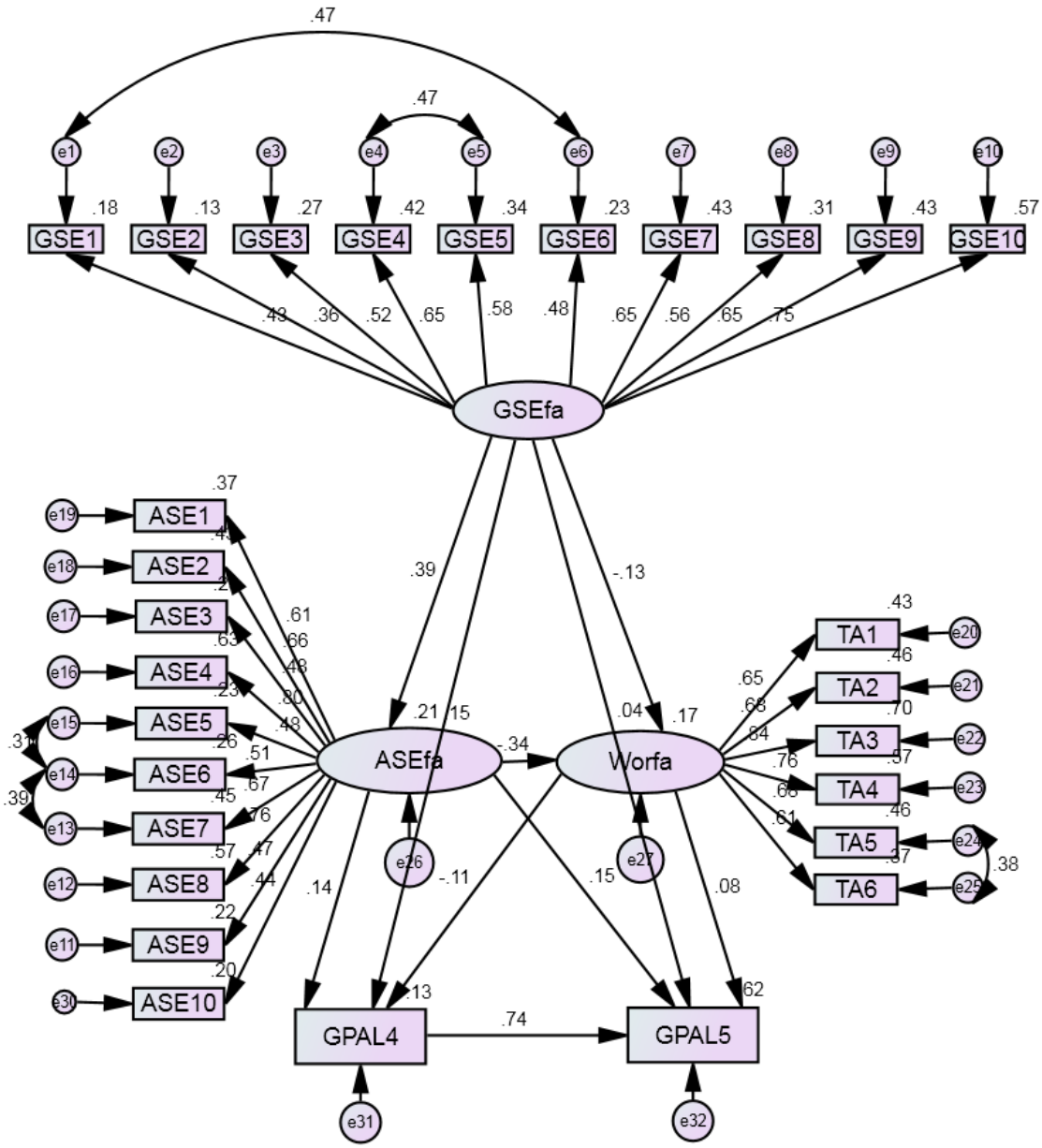


The model presented in figure 2.3 shows associations between academic self-efficacy, general self-efficacy, worry, with its components, and Average marks for levels 4 and 5 and their components. All factor loadings were highly significant (range .70 to .80 and .57 to .81 for level 4 average and level 5 average respectively and .61 - .84 for worry). No cross-factor loadings were suggested by the modification index indicating all items loaded on to their appropriate factors.

As with the previous figure, all factors are in the expected direction illustrating significant variance between academic self-efficacy, general self-efficacy and performance in the positive direction and significant variance between worry and performance in the negative direction. By adding the factors the variance demonstrated in the previous structure (figure 2) has been slightly altered and now accounts for 17% of the variance in level 4 average (1% less) and still 16% in level 5 average. Bootstrapping revealed one significant effect from academic self-efficacy through general self-efficacy to level 4 average (.153) and the value fell within the 95% confidence intervals (CI = .034 to .289, $p<.05$).

The model fit indices were highly acceptable as shown by the following criteria: RMSEA = .037 (Confidence Intervals = .00 to .062); CFI = .979; TLI = .974; Chi-square was also acceptable (χ^2 = 112.8, df = 96, $p > .05$) and the SRMR was .0646. The latter is a very useful index when sample size is not large (Klem, 2000; McDonald & Ho, 2002).

Figure 2.4: Structural Equation Model output diagram: seneral self-efficacy, academic self-efficacy and worry associated with level 4 and 5 Averages (L4 Cohort).

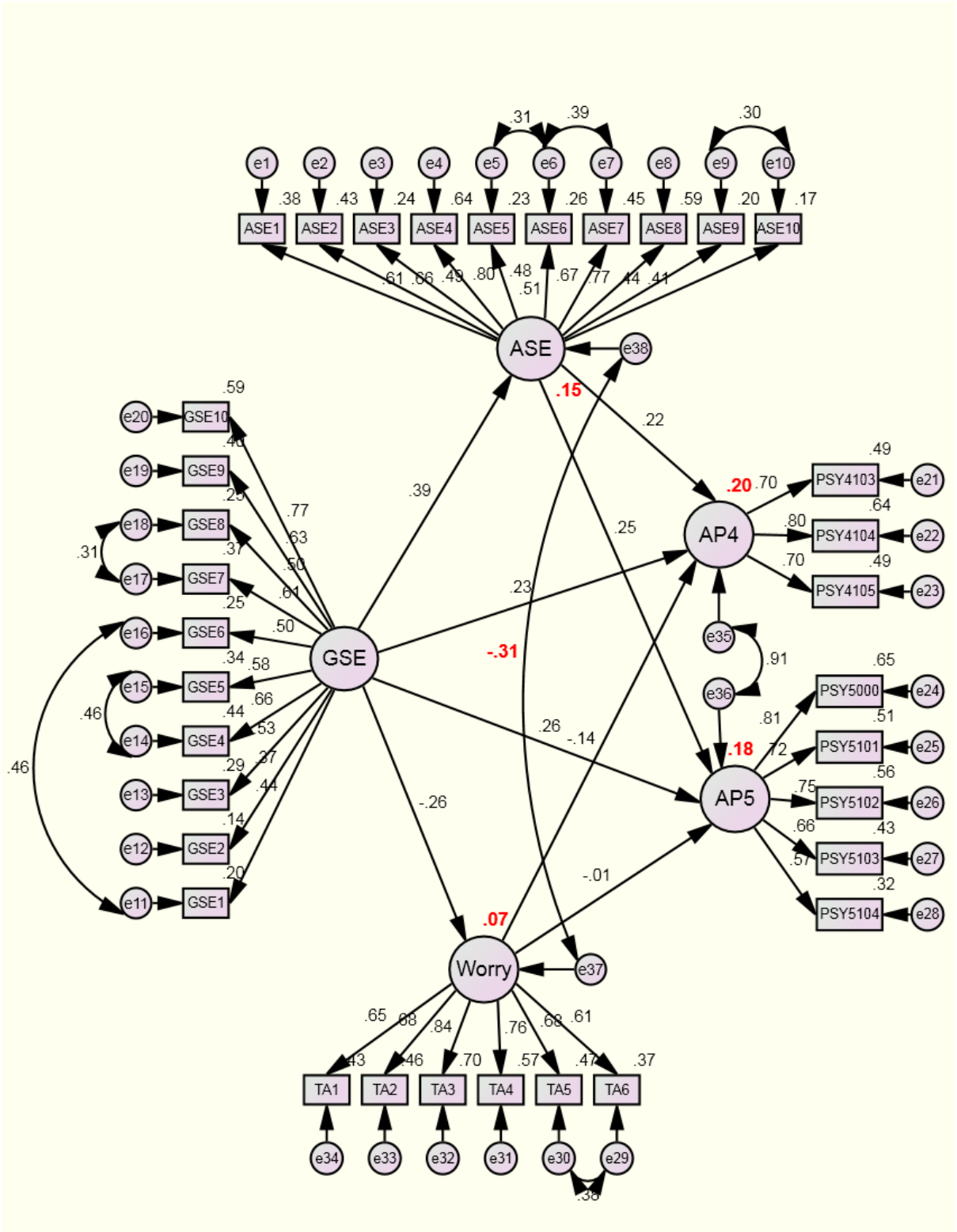


The measurement and structural model presented in figure 2.4 shows associations between academic self-efficacy, general self-efficacy and worry with their components and level 4 and 5 averages. All factor loadings were significant (range .36 to .75; .44 to .80 and .61 to .84 for general self-efficacy, academic self-efficacy and Worry respectively); only one factor loading was below 4.

As with the previous figure, direct effects are in the expected direction illustrating significant variance between academic self-efficacy, general self-efficacy and performance in the positive direction and significant variance between worry and performance in the negative direction. There is also a significant indirect effect between general self-efficacy, academic self-efficacy and worry (-.133, 95% CI = -.307 to -.007, $p<.05$), accounting for 17% variance. This is moderate and as expected in the negative direction (Bandura, 1997). This model accounts for 13% of the variance in average 4 and 15% in average 5. When a path between level 4 and 5 averages was added the variance in level 4 average remained the same but level 5 average changed to .62%; around 54% of the variance can be explained by previous performance which still leaves incremental variance of approximately 8% attributable to general self-efficacy, academic self-efficacy and test anxiety. Bootstrapping revealed one significant indirect effect from general self-efficacy through worry to level 5 average (.26 CI = 117 to .389, $p<.05$).

The model fit indices however, were below that considered acceptable for the structural model: RMSEA = .78 (Confidence Intervals = .068 to .088); CFI = .822; TLI = .800; Chi-square was also significant (χ^2 = 600.3, df =3376, $p < .05$) and the SRMR was .0956. However, factor loadings are good and effect sizes (R^2) are non-trivial, at 13% and very high at 62%, and the model has only one significant indirect effect, and provides 8% incremental validity controlling for previous performance.

Figure 2.5: Structural Equation Model output diagram: general self-efficacy, academic self-efficacy, worry and their components with level 4 and 5 averages and their components (L4 Cohort).



The measurement and structural model presented in figure 2.5 shows associations between academic self-efficacy, general self-efficacy, Worry and their components and level 4 and 5 averages and their components. All factor loadings were significant (range .70 to .80 and .57 to .81 for AP4 and AP5 respectively; 41 to 80, 37 to 77 and .61 to .84 for academic self-efficacy, general self-efficacy and worry respectively). Again, no cross-factor loadings were suggested by the modification indices but most items loaded on to their appropriate factors.

As with the previous figure (figure 2.2), all estimates are in the expected direction illustrating significant variance between academic self-efficacy, general self-efficacy and performance and a significant variance between worry and performance on AP4 in the negative direction. The previous variance has increased by 2% for each outcome by considering the components of the level avregaes and now accounts for 20% of the variance in AP4 and 18% in AP5. Bootstrapping revealed two significant indirect effects from general self-efficacy through academic self-efficacy to AP4 and from general self-efficacy through worry to AP5 (.124; CI = .012 to .0269, $p<.05$).

The model fit indices were moderately acceptable as shown by the following criteria: RMSEA = .068 (Confidence Intervals = .059 to .076); CFI = .837; TLI = .820; Chi-square was not significance (χ^2 = 809.1, df = 51, $p < .05$) but the SRMR was .0887 (close to the borderline of acceptability: .08). Given the problems with the fit indices here and in some of the preceding models, results should be interpreted with caution, especially in the structural components of the models. Future studies with larger samples are needed to support the stability of these models but the non-trivial and good effect sizes (R^2) suggest that the models may be substantive. Also, they have added important indirect effects which suggest support for the conceptual models.

2.4 Discussion

Test Anxiety

Students past experiences and beliefs may lead to high levels of test anxiety and low levels of self-efficacy (Sansgiry & Sail, 2006). Reducing test anxiety and increasing self-efficacy are important aspects for improving students overall experience and academic grades in tertiary education. Test anxiety has shown to be related to fears of negative evaluation, fear of failure and less effective study skills (Peleg-Popko, 2004; Stoeber, Feast & Hayward, 2009). Students with high levels of test anxiety experience encoding difficulties when learning and cognitive interference under test situations and importantly, highly test anxious students tend to perform below their low test anxious or average test anxious peers (Bedewy & Gabriel, 2013; Hembree, 1988; Mashayekh & Hashemi, 2011; Putwain & Symes, 2012). Although researchers deem worry to be the most important aspect of test anxiety (Cassady & Johnson, 2002; Keogh, 2004; Putwain, 2008) the current study employed the four-factor model, ensuring that test irrelevant thoughts and both emotionality components were considered. This proved fruitful as both test irrelevant thoughts and bodily symptoms were associated with academic performance. Although the emotionality component has not been reported to be strongly associated to academic performance in comparison to the cognitive factors (Cassidy & Johnson, 2001; Goetz, Preckle, Zeidner & Schleyer, 2008), the current study highlights that its usefulness should not be underestimated, particularly if all students test anxiety needs are to be more sufficiently addressed. Further, research has indicated that it is the behavioural aspects of intervention programmes that work best for test anxiety reduction (Hembree, 1988); this indicates that behavioural mechanisms are at work in the experience of test anxiety.

In the current study the relationship between test anxiety and academic performance was mixed: consistent with previous research, worry was associated with academic performance but for the level 5 cohort it was associated to only one module at level 4 and level 4 average but not level 5 or level 6 averages. The particular module in question was Research Methods and previous research has shown that students often experience anxiety in this subject (Onwuegbuzie & Wilson, 2003). As worry was only associated with average 4 and not 5 or 6, this could indicate that students may have more experience of the testing environment in later tertiary levels and so the effects of worry are less; it could also be that their academic self-efficacy has increased with experience (acting as a regulatory buffer) or that individuals particularly high on test anxiety have dropped out by level 5. Test

irrelevant thoughts and bodily symptoms were also associated with modules at level 4 adding strength to this argument. For the level 4 cohort, in contrast to the level 5 cohort, worry was associated with all modules at level 4; one module at level 5 and both levels 4 and 5 averages. None of the other components were associated with academic performance in this cohort; interestingly, test irrelevant thoughts does not appear to be associated with any of the academic performance indicators despite this cohort being higher than level 5 on test irrelevant thoughts.

Overall, the results of the current study suggest moderate effects of test anxiety on academic performance; it has been suggested that highly test anxious students take a more vocational route or perhaps even drop out of education altogether early on in their school career (Daly et al., 2011). This would suggest that highly test anxious individuals may not make it to tertiary education; for those that do make it, there is a possibility that such individuals have mastered the art of test taking and so it becomes less salient at this level (Hembree, 1988; Taylor & Deane, 2002). Other research however, has demonstrated a positive association between test anxiety and academic performance at tertiary level (e.g., Bedewy & Gabriel, 2013) and it is likely that for many individuals test anxiety has been persistent over the course of their educational life; this study reaffirms that many years of testing experience does not diminish test anxiety for all students. This fits with the trait explanation of test anxiety, that it is enduring and stable; whereas the state school of thought suggest it is situation dependant (Burns, 2004); test anxiety may be situation-dependent (evaluative situations) but persistent in that it can be present every time a person is being evaluated. As test anxiety exists in coursework assessment as well as exams there is a suggestion that coursework simply prolongs test anxiety, or that some common, underlying mechanisms may be at work in both forms of assessment. However, this may be dependent upon whether there is adequate tutor support, reassurance and supervision as suggested in this study for the dissertation module.

Despite the possibility that test anxiety reduces with experience and age (Taylor & Deane, 2002), tests are difficult to escape, even in employment; it is also possible that without suitable intervention, test anxiety could continue throughout a person's career and indeed affect their chances of progression in both education and employment (Betz, 2007; Burns, 2004). This is also the case for self-efficacy which is associated with job performance and satisfaction (Judge & Bono, 2001). There is also the possibility that the true magnitude of the impact of test anxiety at an ideographic level is disguised by nomothetic research, and

future longitudinal research at the ideographic level might reveal a closer relationship to reality with selective case studies.

Self-efficacy

With regard to self-efficacy, academic self-efficacy was the only significant efficacy indicator for the level 5 cohort; however, both general self-efficacy and academic self-efficacy were significant for the level 4 cohort. The reason general self-efficacy may be associated to academic performance in one cohort and not the other could be because the modules for the level 4 cohort had been restructured. The restructure included moving over to year long modules with fewer exams. It may be that general self-efficacy is more prominent where assessment is distributed more evenly and academic self-efficacy more prominent for modules with more exam components; general self-efficacy may be more useful in terms of academic performance outcome for this group. Future research might consider modules across programmes and academic years in order to fully explore this possibility. It could also be that this cohort was just generally more self-efficacious but as can be seen from the correlation analyses for the level 5 cohort general self-efficacy is not necessary for academic self-efficacy to be present. A more likely scenario is that students at this level are unsure of academic requirements at tertiary level and so academic self-efficacy has not had time to develop fully, therefore students draw on general efficacy resources.

Test anxiety and self-efficacy

It has been established that self-efficacy varies and changes depending upon the situation i.e., when individuals are given a novel task their self-efficacy may be lower than when they have mastered a challenge (Komarraju et al., 2009; Phan, 2012). Once they have mastered a challenge however, individuals need to be presented with another challenge in order to feel they have achieved a goal and for their self-efficacy to increase (Usher & Pajares, 2009). An academic setting is the perfect breeding ground for self-efficacy beliefs; tasks are not novel once students have established how they need to approach their work and study behaviour, but assessments naturally progress in level of difficulty allowing self-efficacy beliefs to develop. For the current study, despite tests increasing in difficulty, once academic self-efficacy is introduced the effects of test anxiety appear to be less. For the level 5 cohort a one-way ANOVA revealed that individuals with high academic self-efficacy have lower test anxiety indicating high levels of self-efficacy may lessen the

effects of test anxiety total, and its cognitive subcomponents. For the level 4 cohort the affects were slightly stronger and academic self-efficacy appears to reduce the effects of worry, test irrelevant thoughts and Bodily Symptoms; tension was not significant. Therefore, in addition to possible experience effects a further possibility may be that the effects of test anxiety may have been negated or certainly reduced by high levels of academic self-efficacy. However, the conclusion is tentative given the cross-sectional nature of this aspect of the study.

Research suggests that self-efficacy measures need to correspond to the outcome with which they are compared (Zimmerman, 2000); the current research employed an academic self-efficacy measure in light of this. For the level 5 cohort academic self-efficacy was the most robust predictor of yearly average across levels 4, 5 and 6. Path analysis revealed that academic self-efficacy accounted for 16% of the variance in level 4, 8% of the variance in level 5 and 11% of the variance in level 6. This pattern altered slightly for the level 4 cohort: academic self-efficacy, general self-efficacy and worry accounted for 18% of the variance in level 4 average and 16% of the variance in average 5. When the factor components were added, this increased to 20% of the variance in average 4 and 18% in average 5. From this model general self-efficacy emerges marginally stronger than academic self-efficacy in both 4 and 5 (.23 versus .22 and .26 versus .25 for average 4 and 5 respectively). When a path was added between level 4 and 5 average the variance for average 4 and 5 was 13% suggesting that self-efficacy and test anxiety still add incremental variance even when controlling for previous performance as shown in figure 2.4. A couple of the models demonstrated high chi-square levels; this could be due to using a relatively small sample, although chi-square is no longer regarded as a top fit indicator due to its oversensitivity in rejecting models even with large samples (Byrne, 2010).

Despite the associations between general self-efficacy and academic performance for the level 4 cohort, caution should be demonstrated in using the General self-efficacy measure for academic purposes; this study highlights that the academic self-efficacy measure demonstrated more validity. Further, the general self-efficacy measure did not demonstrate any associations for the level 5 cohort, whilst the academic self-efficacy measure was highly associated and was the most robust independent predictor variable. This is consistent with Bandura (2012), who highlights general trait measures may mask variability in individuals' beliefs in their capabilities for different activities such as academia.

Summary, strengths, limitations and future directions

The aims of this study were to determine the impact of self-efficacy and test anxiety on academic performance and to establish whether self-effiacy provided some defence against test anxiety. In doing so, the current study utilised objective performance outcomes across the entire tertiary programme, including coursework, examinations, overall module grades and yearly averages. This approach revealed interesting associations between test anxiety, self-efficacy and module performance.

According to Gore (2006) students' academic beliefs are more accurate when they have experience within the academic field and Diseth (2011) found that academic performance was associated with future self-efficacy beliefs; the current study collected data from the first and middle year for a more accurate reflection of how self-efficacy affects performance at university. As Gore suggests it would be useful to promote self-efficacy beliefs early in semester one and future research may benefit from measuring self-efficacy at two time points i.e., the beginning of semester 1 and then at the beginning of semester 2; this could also be compared between those that have received self-efficacy guidance and those that have not as scores are likely to change as students gain experience (Gore, 2006; Caprara et al., 2011; Phan, 2012). Further, according to Cassady (2004) the test reflection stage lays the foundations for the next testing cycle and can be detrimental to future success, perceived anxiety and most likely self-efficacy; it may be useful to measure self-efficacy and test anxiety throughout an individual's academic career to affirm the cycle of test anxiety and self-efficacy.

It could be argued that caution should be taken when generalising the current results to other students but as this study took into account all types of assessment (coursework, comprehension, essay writing, report writing, multiple choice and so on) and it is necessary for all students to takes multiple types of assessment (Prat-Sala & Redford, 2010; Prat-Sala & Redford, 2012) it could be argued that the findings presented here would apply to a range of undergraduate students. Prat-Sala and Redford (2010; 2012) only assessed reading and writing skills; the current research extends this by assessing report writing, statistic skills, multiple choice, in addition to comprehension and essay writing, and is enhanced by assessing this through both coursework and exams.

Consistent with Alivernini and Lucidi (2011) academic performance was generally stable across different time points; in this case 2 years (level 4 cohort) and 3 years (level 5

cohort). Caprara et al., (2008) found that the lower the decline in self-efficacy, the higher the grades and greater the likelihood students would remain in education. Further, previous research shows that reductions in test anxiety can increase grades (Hembree, 1988; Seipp, 1991); given the current associations, intervention may do the same here. It might be useful for future research to consider a longitudinal analysis adopting a person-centred approach to follow selected students through their academic career from GCSE level in high school, through A-level and degree. Akin to Putwain and Daly (2013), it might also be useful to group students given their test anxiety/self-efficacy associations; for instance low self-efficacy/high test anxiety; high self-efficacy/low test anxiety; high self-efficacy/high test anxiety and so forth. This will help establish interactions between the two variables and further determine whether the two go hand-in-hand.

It has been established that test anxiety can render it difficult for students to progress through the educational system, with the possibility that those with debilitating test anxiety withdraw from the education system early on in their school careers (Cassady, 2004; McDonald, 2001); this may explain the relatively modest percentage of variance for test anxiety in average marks (Bedewy & Gabriel, 2013). Nevertheless, test anxiety clearly does exist in tertiary education illustrating the need to curtail the problem. The current research did not include scores of individuals who had dropped out or indeed directly assess retention rates in relation to test anxiety. Future research may consider how test anxiety impacts upon retention rates; high self-efficacy has shown to reduce students' intentions of dropping out (Alivernini & Lucidi, 2011). It would be of interest to do a follow-up study to see whether test anxiety increases or declines depending upon grades. Also, it might be a useful addition to measure test anxiety at different points in time to augment this. It may also be useful to compare an intervention group with non-intervention (both high test anxiety).

Future research could identify where test anxiety is more likely to be present and where self-efficacy is most likely to negate the symptoms of test anxiety. It could be that high self-efficacy is more likely to develop in situations where there is chance to build a relationship with the subject tutor or where there is time to learn the material sufficiently. Feedback may be an important facilitator for increasing self-efficacy (Caraway 2003) but tasks also need to be sufficiently challenging (Linnenbrink-Garcia & Pintrich, 2011). Whilst the resources may not exist to provide individual feedback; this could be provided in group tutorials as these are generally smaller than lectures.

Although the impact of test anxiety seems modest (correlations/percentage of variance) the adverse effects it has on individuals can be considerable. Whilst the associations between test anxiety and academic performance are predominantly cognitive; interventions show that behavioural interventions work well; whereas cognitive interventions are questionable with some working and some not (Hembree, 1988). Brown, Forman, Herbert, Hoffman and Yue (2011) found that Acceptance-Based Behaviour Therapy (ABBT) improved academic performance, whereas Cognitive Therapy reduced it. There is also evidence for the success of combined behavioural and cognitive approaches (Ergene, 2003; Lofti, Eizadi-fard, Ayazi, Agheli-Nejad, 2011). Through a meta-analysis Ergene also found individual and combined individual and group approaches worked best. On a practical level, as both test anxiety and self-efficacy are malleable (Caprara et al., 2011) interventions are likely to be effective. Whilst training in self-efficacy may assist in ameliorating test anxiety (Hassanzadah, Ebrahimi & Mahdinejad, 2012), it would be useful to combine the two to ensure the full benefits of intervention are realised.

Although females have shown to have higher levels of test anxiety than their male counterparts; this does not translate into performance (Casssady & Johnson, 2001; Cassady & Johnson, 2004b; Hembree, 1988; Chapell et al., 2005); this could be because females generally have higher Grade Point Average than males and so this test anxiety disparity balances out (Chapell et al., 2005); it may also be that females are more likely to report anxiety, than males (McDonald, 2001). Taking this into account, considering the well-established role of gender and given that the majority of the current sample is female, gender is not included in this analysis.

Finally, as Cassady and Johnson (2001) highlight, a student's academic performance involves a whole gambit of factors including personality (as seen in chapter one), intelligence (though possibly minimal at tertiary level), preparation, organisation and test taking skills. Self-efficacy and test anxiety add substantially to academic performance outcome and should not be underestimated. As Bandura (2012) asserts it is not just about ability but how well an individual's skills are orchestrated that determine the quality and outcome of performance and these skills are important not only for the destination but also for navigating the academic journey.

In conclusion, although the individual constructs and academic performance indicators in this study are not new to the research map, they have been configured and aligned in a manner that adds new dimensions and directions to the research process:

1. Test Anxiety was explored with 4 sub-scales, covering Cognition and Emotionality, and does more justice to the full anxiety experience and the full student experience of assessment (i.e. its application of a spectrum of academic performance indicators)

2. Self-efficacy was assessed by a general and a specific measure and their differential impact on performance was assessed both across two cohorts and across a variety of performance indicators. This comprehensive approach has not been previously attempted.

3. The relationship between test anxiety and academic self-efficacy was explored by categories to amplify and accentuate the associations. The combination of the two is under explored and this study has shown a systematic relationship between them in two cohorts at an academically specific level and this tentatively suggests a good basis for a test anxiety intervention study, and the self-efficacy construct provides an excellent framework in which to develop this.

4. Comparisons and contrasts of descriptive and inferential statistics across cohorts has identified similarities and differences (e.g. on general self-efficacy) that might be useful for Induction and also may be useful in supplementing LJMU research on the "Sophomore Slump".

Chapter 3

The impact of emotional intelligence on academic performance

Abstract

A quantitative, cross-sectional design using self-report measures for Emotional Intelligence and objective academic performance outcomes was conducted with N=399 level 4 and 5 (Current) and N=961 (cross-cohort) participants. This was a development of a project that had commenced already and the researcher contributed data from three LJMU cohorts (N=762). Cohort emotional intelligence scores were aligned with recent academic performance indicators including module averages, level averages, yearly grade point average and specific coursework and exam grades for the level 5 cohort. Emotional intelligence has shown mixed findings in relation to the Emotional Intelligence/Academic Performance relationship (e.g., Agnoli et al., 2012; Lam & Kirby, 2002; Marquez, Martín, & Brackett, 2006; Song et al., 2010). Results showed weak correlations between emotional intelligence and Academic Performance and cohort comparison revealed similarities across cohorts on emotional intelligence, with all groups scoring within the normal range. Results of analyses are presented and findings discussed; implications and future directions are provided.

3.1 Introduction

As discussed in previous chapters educational attainment is fundamental to academic progression and future career success. Research pertaining to the influence of personality variables, self-efficacy and test anxiety on academic performance has been established and corroborated by the studies within this thesis and from previous meta-analyses. Another important individual difference variable that has shown some interesting findings in relation to achievement is Emotional Intelligence (Salovey & Mayer, 1990). There has been much popular literature cited about the effects of emotional intelligence, some suggesting that it is predictive of academic success beyond traditional measures of intelligence (Mayer, Roberts & Barsade, 2008; Petrides et al., 2007). There are mixed findings in relation to this within the academic field with numerous studies suggesting this is not the case (Barchard, 2003); although some have found support for this (Agnoli et al., 2012; Lam & Kirby, 2002; Marquez et al., 2006; Song et al., 2010). As mentioned in previous chapters,+- intelligence is not measured within this thesis because of weak

associations at best to tertiary education (Sanchez-Ruiz, Mavroveli & Poullis, 2013); in addition it has been well established that a person's success in life also relies on other personal factors (Derksen, Kramer & Katzko, 2002; Mohzan, Hassan & Halil, 2013). Emotional intelligence is one such factor and it is suggested that emotionally intelligent individuals are more likely to achieve higher grades than their low emotional intelligence counterparts (Agnoli et al., 2012; Castro-Johnson & Wang, 2003; DiFabio & Palazzeschi, 2009; Mavroveli, Petrides, Sangareau & Furnham, 2009; Maraichelvi & Rajan, 2013; Parker, Summerfeldt, Hogan & Majeski, 2004; Song et al., 2010).

Much research has focused on the distinction between ability measures and trait measures of emotional intelligence and, due to their weak correlation, divergent validity has been demonstrated (Brackett & Mayer, 2003; Brackett et al., 2006; Derksen et al., 2002; Freudenthaler & Neubauer, 2005; Mavroveli, Petrides, Shove & Whitehead, 2008; Petrides & Furnham, 2000; Perez, Petrides & Furnham, 2006; Warwick & Nettelbeck, 2004). The ability measure has been linked more closely with intelligence (Brackett & Mayer, 2003; Lopes, Salovey & Straus, 2003; O'Connor & Little, 2003; Van Rooy & Viswesvaran, 2004) whilst still showing some divergent validity (Derksen et al., 2002; Fox & Spector, 2000; Lam & Kirby, 2002; Lyons & Schneider, 2005) whereas the trait measure of emotional intelligence (as measured by self-report) has been more closely linked to personality and is considered distinct from intelligence (Bastian, Burns & Nettelbeck, 2005; Daus & Ashkanasy, 2003; Dawda & Hart, 2000; Humphrey, Pollack, Hawver & Story, 2010; Joseph & Newman, 2010; O'Connor & Little, 2003; Petrides, 2011; Saklofske, Austin & Miniski, 2003; Van der Zee, Thijs & Schakel, 2002; Van Rooy et al., 2005) demonstrating typical performance, rather than maximal performance or ability (Petrides & Furnham, 2000; 2001; Warwick & Nettelbeck, 2004; Zeidner, Matthews & Roberts, 2012). Whilst trait emotional intelligence is considered to be related to personality, particularly Openness and Agreeableness, a comprehensive review reports correlations are low to moderate (Mayer, Roberts & Barsade, 2008) and research has shown it is not measuring the same aspects as other personality measures, as such it is considered a low-order personality trait that is distinct from the other measures (e.g., Five Factor Model) within the personality factor space, showing incremental validity (Ciarrochi, Chan & Caputi, 2000; Di Fabio & Palazzeschi, 2009; Fernandez-Berrocal & Extremera, 2006; Ferrando, Prieto & Almeida et al., 2010; Mayer, Salovey, Caruso & Sitarenios, 2003; Petrides, Pita & Kokkinaki, 2007; Petrides, 2011; Qualter, Gardner & Pope et al., 2012; Sanchez-Ruiz, Mavroveli & Poullis,

2013; Van der Zee, Thijs & Schakel, 2002). Petrides and Furnham (2000; 2001); Perez, Petrides and Furnham, (2006) and Petrides (2011) assert emotional intelligence ability and emotional intelligence trait are two separate constructs.

Nelis, Quoidbach, Mikolajczak and Hansenne (2009) state that whilst ability emotional intelligence may measure what an individual knows about ability and what they should or can do in certain situations, trait measures assess what an individual will do. To this end, the current study will focus on the self-reported version of emotional intelligence rather than the ability measure due to the premise the ability measure is oft confused with, and closely related to, the realm of general mental ability (Adeyemo, 2007; Derksen et al., 2002; Petrides, Frederickson & Furnham, 2004) whereas divergent validity between trait measures and general mental ability has been demonstrated (Bar-On, 1997; Derksen, Kramer & Katzko, 2002) in support of individual difference variables being adequately portrayed through self-report (as discussed in chapter 1). Further, as suggested by Petrides (2011) it is not best practice to objectify emotional responses as they are inherently subjective.

emotional intelligence has been conceptualised as the ability to discriminate or accurately perceive, appraise monitor, regulate and express the emotions of self and others (Salovey & Mayer, 1990; 1997; Mayor, Salovey & Caruso; 2004) and refers to emotional-behavioural dispositions and self-perceptions of emotional competence (Petrides, 2011). Mayer and Salovey (1997) consider emotional intelligence to be a cognitive ability that enables an individual to process emotions; however, trait models (mixed models) define emotional intelligence not as cognitive abilities but as a skill set that is developed to assist individuals in coping with the demands and pressures of the environment (Schutte et al., 1998; Petrides & Furnham, 2001). Trait emotional intelligence is conceptualised as a lower-order personality construct that encompasses skills in emotional self-perception and behavioural dispositions including the ability to perceive, generate, reflect on and regulate emotions (Petrides & Furnham, 2001; 2003; Petrides, Pita, & Kokkinaki, 2007; Mayer & Salovey, 1997). Students with such skills may be able to ward off anxious thoughts in relation to study and exams, practise more help seeking behaviours, have better problem – solving skills, better coping strategies, which may assist them in coping with university work demands, and are more able to recover from academic setbacks and so move forward following academic difficulties (Adeyemo, 2007; Bastian et al., 2005; Salovey, Stroud, Woolery, & Epel, 2000). Emotional intelligence involves both Intrapersonal emotional

intelligence (recognising, perceiving, interpreting, understanding, coping and expressing one's own emotions in order to guide thinking and action) and interpersonal emotional intelligence (recognising, perceiving, interpreting, understanding and coping with the emotions of others) (Van der Zee et al., 2002; Van Rooy & Viswesvaran, 2004). Intrapersonal emotional intelligence might be associated with better emotion regulation and self-management, whereas interpersonal might be associated with coping involving the utilisation of support from others (Austin, Saklofske & Mastoras, 2010).

The measures used in the current study are theoretically related but assess distinct aspects of emotional intelligence. The Trait Meta Mood Scale is focused on intrapersonal experience and involves the monitoring, evaluation and regulation of one's own feelings and emotions. It has three subcomponents measuring cognitive components including attention to feelings (for instance how much attention individuals pay to their own feelings and emotions); clarity (understanding and discriminating between emotions); and repair (being able to repair mood following negative emotional experiences) (Salovey, Mayer, Goldman, Turvey & Palfai, 1995). The Assessing Emotions Scale is a unidimensional measure that assesses both intrapersonal and interpersonal intelligence including emotional appraisal and expression of emotion in the self and others, regulation of emotions in the self and others, and the utilisation of appropriate emotions in solving problems. The Trait Emotional Intelligence Questionnaire short-form is also based on trait emotional intelligence theory and whilst employing a global score, includes 2 of each of the 15 sub-facets from the larger measure and is thought to be a useful assessment of emotional intelligence (Petrides, Furnham & Mavroveli, 2006). The Trait Emotional Intelligence Questionnaire is possibly the most comprehensive measure and includes assessment of emotional expression, empathy, emotional regulation (being able to change unpleasant moods and prologue pleasant moods through emotional insight and effort), social awareness, impulsiveness and mood management. Finally, the Emotional Self-Efficacy Scale (Kirk, Schutte & Hine, 2008) is the most distinct construct and combines Emotional Trait Theory with Social Cognitive Theory bringing together both emotional intelligence and self-efficacy, and whilst Kirk et al., (2008) agree that emotional self-efficacy may be a component of trait emotional intelligence, they state that it is not identical. The Emotional Self-Efficacy Scale has been developed as a measure of self-efficacy for adaptive emotional functioning. Its emotional components are based on Mayer and Salovey's (1997) and Mayer et al.'s (2004) four-branch model of emotional intelligence that includes the

accurate perception, the understanding and the effective management of emotion in the self and others, and using emotions to assist thinking and aid decision making. The self-efficacy components are based on Bandura's (2001) guidelines and represent an individual's perception of what they can do rather than what he or she actually does.

Emotional intelligence and academic performance

Emotinal intelligence has been studied at all levels of education, particularly secondary and tertiary and findings demonstrate association with academic performance above and beyond cognitive ability and personality (Agnoli et al., 2012; Di Fabio & Palazzeschi, 2009; Fernandez-Berrocal & Extremera, 2006; Lam & Kirby, 2002; Marquez et al., 2006; Song et al., 2010; Van der Zee, Thijs & Schakel, 2002). For research that has reported positive associations between emotional intelligence and academic performance, correlations range from .17 to .33 (Adeyemo, 2007; Barchard, 2003; Bracket & Mayer, 2003; Chew, Zain & Hassan, 2013; Downey, Mountstephen, Lloyd, Hansen & Stough, 2008; Lam & Kirby, 2002; Parker et al., 2004; Schutte et al, 1998) with some studies asserting predictive validity (Agnoli et al., 2012; Bar-On, 1997; Fernandez, Salamonson & Griffiths, 2012; Jaeger, 2003; Parker, Creque & Barnhart et al., 2004; Rodeiro, Emery & Bell, 2012; Van der Zee, Thijs & Schakel, 2002). There has also been the suggestion that emotional intelligence is utilised as a compensatory mechanism for students with lower ability (Petrides et al., 2004; Agnoli, Mancini & Pozzoli et al., 2012). Whilst some studies report positive association between emotional intelligence and academic performance, others report non-significant findings (Amelang & Steinmayr, 2006; Bastian, Burns & Nettelbeck, 2005; Newsome, Day & Catano, 2000; Rode et al., 2007) and others suggest some aspects of emotional intelligence are associated with academic performance but not others (Castro-Johnson & Wang, 2003; O'Connor & Little, 2003; Mohzan et al., 2013) or emotional intelligence is associated with limited academic performance outcomes (Austin, Evans, Goldwater & Potter, 2005; Mavroveli & Sanchez-Ruiz, 2011); such studies found emotional intelligence to be associated with some exam outcomes but not others. Responsibilities, challenges, stress, high workload and balancing studies with other commitments (work, home, social) can overburden students and ultimately affect their academic performance; it is thought that emotional intelligence may provide a buffer against such difficulties (Austin, Saklofske & Mastoras, 2010). Fernandez-Berrocal and Extremera, (2006) found the ability to manage stress was important in both autumn and spring exams; however, this was particularly pertinent in relation to the spring exams

suggesting that emotional intelligence may be utilised more effectively when stress levels are highest (Pau et al., 2007; Ebrahimi, 2013).

The evidence for the emotional intelligence/academic performance relationship is not straight forward, with methodological limitations for instance mixed outcome criteria such as different academic performance indicators (see chapters 1 and 3 for limitations regarding academic performance measurement), small sample sizes, correlational analyses from which it cannot be ascertained whether doing well academically enhances an individual's emotional competencies or whether sound emotional perceptions are conducive to improved performance, various definitions of emotional intelligence (Mavroveli & Sanchez-Ruiz, 2011) and mixed understanding as to what emotional intelligence is actually measuring. O'Connor and Little (2003) suggest that neither the ability nor the trait measure of emotional intelligence are valid predictors of academic performance. In an attempt to tackle the inconsistencies in previous literature this study brings together four different emotional intelligence measures to validate consistency and as suggested by Barchard, (2003) apply detailed assessment to all four measures. There has been much suggestion that some measures of emotional intelligence relate to performance and some do not, this study aims to demonstrate consistency across some of the better-known inventories, thus minimising the risk of bias that might be associated with a single measure (Warwick & Nettelback, 2004). Different findings can depend on how academic performance is operationalised (Agnoli, et al., 2012; Jaeger & Eagan, 2007); numerous studies measure Grade Point Average, mean mark or assessment at one point in time such as at the end of the first year of study or only core subjects, teacher ratings or self-reported grades (Adeyemo, 2007; Barchard, 2003; Downey et al., 2008; Fernandez et al., 2012; Mayer et al., 2008; Mestra et al., 2006; Mohzan, Hassan & Halil, 2013; O'Connor & Little, 2003; Parker et al., 2004; Rode, Mooney & Arthaud-Day, 2007; Schutte, 1998). For studies that have considered more than one subject, findings have shown mixed results with emotional intelligence being predictive of some subjects but not others or exams at one point in time (i.e., mid-term) but not others (end of term) (Austin et al., 2005; Agnoli et al., 2012). These factors could confound the results, therefore, the current study utilises grades from across 3 levels (4, 5 & 6) and includes module specific averages, yearly averages and overall Grade Point Average or degree award mark with a sample of coursework and exam grades. Moreover, in light of call from Linnenbrink-Garcia and Pekrun (2011) and Agnoli et al., (2012) this study addresses cohort comparisons.

Cohort comparisons and norms

As in chapter 1, this study considers standard responses derived from Psychology students through previous cohort comparisons. Specifically, this study examines whether five cohorts of psychology students have similar Emotional Intelligence profiles, thus adding an extra dimension to the current study. This part of the study tests whether mean scores across the emotional intelligence measures are comparable across the cohorts (2009-2013). Further, emotional intelligence has not been compared directly with other cohorts from the same stage in the educational process; this study aims to bridge that gap.

Taking the above limitations into account and extending previous literature, the current research will attempt to more fully determine the impact of emotional intelligence on academic performance by using various emotional intelligence measures and academic performance outcomes. The chequered evidence base leads to the following hypotheses:

H_1. Emotional Intelligence will be moderately and positively associated with academic performance.

H_2. Not all measures of Emotional Intelligence will be associated with academic performance; some may be more strongly associated than others. Due to the varying evidence base it is not stipulated which measures will be more strongly related to academic performance.

H_3. Emotinal intelligence will be related to specific aspects of academic performance in addition to module scores and global averages; particularly those modules were students may be more anxious or where more focus is required and so it is necessary to utilise emotional intelligence more effectively (e.g., Research Methods and the Dissertation module).

H_4. The cohorts will score consistently on across the Emotional Intelligence measures.

3.2 Method

Design

This study is an archival longitudinal, cross-sectional, correlational design. The Independent Variables are the self-report measures. The Criterion Variables are the indices of Academic Performance (see chapter 1 for more detail). All data were tested for assumptions in relation to normality, homogeneity, reliability. Data analysis included descriptive and inferential statistics and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled.

Participants

The present sample comprised *N* = 399 participants (across levels 4 and 5), for level 4 the majority were female (f = 82.1%; m = 17.9%) age range 18-32 years (m = 19.32; SD = 2.09. The pattern was the same for level 5 (fm = 77.3%; m=22.7) aged 19 – 54 years (mean age = 20.60; SD 3.15) and most were British Caucasian. An opportunity sample of UK undergraduate students studying Applied Psychology took part. The academic results were taken from the School database and included level 4 and 5 modules for the data collected from the Level 4 cohort, and levels 4, 5, 6 including final degree classification, for the data collected from the level 5 cohort.

In addition to the current sample *N* = 961 students past and present (from 2009 to 2013), were included in the cohort comparison. These were undergraduate students enrolled on a Psychology programme at LJMU and a university in the North West of England, UK. In both institutions the majority of the sample was female. All students were in the second year of their study programme (level 5), with an average age of 20 years. The data are only used in this study for normed references and cohort comparison.

Materials

The Trait Meta Mood Scale (Salovey, Mayer, & Goldman et al., 1995)

A 30 item measure to assess emotional stability including individual differences in attention to feelings, mood, clarity and repair or regulation of moods and emotions. Items include statements such as: ‘I am rarely confused about how I feel’ or ‘I can never tell how I feel’. Participants indicate levels of agreement on a 5-point Likert response format from 1 (strongly disagree) to 5 (strongly agree). There are four subscales, namely, Attention (to

feelings) Clarity (of feelings) and Repair (being able to repair emotions). Higher scores indicate higher self-reported emotional intelligence. This measure was chosen because of its sound psychometric properties including good reliability and established validity.

The Trait Emotional Intelligence Questionnaire (Petrides & Furnham, 2001)

This is a 30 item measure that assesses emotional intelligence in which items such as "I can deal effectively with people" or "On the whole , I'm able to deal with stress", are rated on a 7-point Likert format, ranging from 1 (strongly agree) to 7 (strongly disagree). Again higher scores indicate higher self-reported emotional intelligence. In accordance with the Trait Meta Mood Scale this measure was chosen because of its sound psychometric properties including excellent reliability and established validity.

Assessing Emotions Scale (Schutte, Malouff & Hall et al., 1998)

This is a 33 item self-report scale developed to assess levels of emotional intelligence. The response format is a five point Likert scale (1 = strongly disagree to 5 = strongly agree). A sample item is "I have control over my emotions". Higher scores indicate greater levels of emotional intelligence. The scale has a good alpha level indicating good reliability and internal consistency.

Emotional Self-Efficacy Scale (Kirk, Schutte, & Hine, 2008)

This is a 32 item self-report scale developed to assess self-efficacy for adaptive emotional functioning within the model of emotional intelligence. The response format is a five point Likert scale (1 = not at all confident to 5 = very confident). Sample items are "I can use positive emotions to generate good ideas"; ''I can Correctly identify when another person is feeling a negative emotion'' and ''I can regulate my own emotions when under pressure'' Higher scores indicate greater levels of emotional intelligence with a mid point of 96. The scale has a good alpha level indicating good reliability and internal consistency.

For Procedure see chapter 1; for academic performance details and statistical analysis information see chapters 1 and 2.

3.3 Results

Table 3.1: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Emotional Intelligence (L4 cohort)

	AES	TEIQ	TMMS(T)	ATTENTION	CLARITY	REPAIR	ESES
Mean	123.03	138.65	104.08	45.29	38.40	20.39	117.12
SD	13.54	18.65	12.61	5.50	6.50	4.30	14.41
Skewness	-.322	-.290	-.147	-.292	-.187	-.331	-.169
Kurtosis	.022	-.125	-.407	-.092	-.172	-.305	1.158
Alpha	.88	.85	.82	.63	.80	.67	.93
Norms/mid points	99	120	90	39	33	18	80

Key: AES = Assessing Emotions Scale; TEIQ = Trait Emotional Intelligence Questionnaire; TMMS = Trait Meta Mood Scale; Attention, Clarity and Repair are subscales of the TMMS ESES Emotional Self-efficacy Scale

Table 3.2: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Emotional Intelligence (L5 cohort)

	AES	TEIQ	TMMS(T)	ATTENTION	CLARITY	REPAIR	ESES
Mean	124.31	148.23	110.52	48.05	40.39	22.08	117.41
SD	11.79	17.17	11.67	6.26	6.36	4.50	12.79
SK	-.721	-.250	-.323	-.876	-.404	-.657	-.084
Kurtosis	3.746	.114	.429	1.365	-.223	.114	.084
Alpha	.82	.81	.80	.76	.80	.76	.87
Norms/mid points	99	120	90	39	33	18	80

Table 3.3: Means, Standard Deviations, Skewness and Kurtosis for AP (L4 cohort)

	RMI	DEV SOC PSY	LCB PSY	CON ISS PSY	RMII	BCD	SPID	ABN PSY	PSY APP	AV 4	AV 5
Mean	61.58	62.45	58.30	58.78	59.25	60.15	61.03	59.62	61.70	60.31	60.35
SD	7.700	8.313	7.571	7.076	9.055	7.373	6.518	6.484	9.958	6.349	6.166
SK	-.052	-.206	-.076	-.793	-.602	-1.031	-.366	-.179	-1.658	-.201	-.796
Kurtosis	-.226	-.072	.317	1.207	1.211	6.530	.133	.494	6.174	.165	2.532

*The high skewness for BCD & PSY APP is due to two participants scoring very low on these modules (below pass rate of 42); this also applies to the high kurtosis for SPID and ABN PSY in the following tables.
Key: RMI =Research Methods I DEV SOC PSY = Developmental & Social Psychology LCB = Learning, Cognitive and Biological Psychology CON ISS PSY = Conceptual Issues in Psychology RMII = Research Methods II BCD = Biological Cognitive & Developmental SPID = Social Psychology and Individual Differences ABN PSY= Psychology of Abnormal Behaviour PSY APP = Psychology in Application II AV4 = Level 4 Average AV= Level 5 Average

Table 3.4: Means, Standard Deviations, Skewness and Kurtosis for AP (L5 cohort)

	INT PSY	SOC PSY	HM PSY	DEV PSY	L & COG	INT RM	RMII	BCD	SPID	ABN PSY	PSY APP	DISS	COG NEU	OCC PSY	FOR PSY	PSY ED	AV4	AV5	AV6	GPA
Mean	59.94	55.10	59.44	58.98	62.16	58.38	57.35	58.41	62.10	60.35	62.43	62.87	62.18	60.70	60.26	60.92	59.12	60.72	61.54	62.58
SD	7.90	8.93	8.39	7.53	9.52	9.92	11.61	7.96	7.04	6.24	7.05	8.56	8.94	8.17	7.63	8.14	5.82	5.93	6.64	5.86
SK	-.313	-.448	-.638	-.394	-.487	.007	-1.075	-.654	-1.866	-.674	-.270	-.451	-.446	-.317	-.529	-.969	-.329	-.655	-.550	-.296
Kurtosis	1.49	.061	.575	.270	.242	-.103	1.987	.409	6.498	1.935	.462	.735	1.383	.612	.662	1.316	-.220	.973	.967	.237

Key: INT PSY= Introduction to Psychology SOC PSY = Social Psychology HM PSY = History of Modern Psychology DEV PSY = Developmental Psychology L & COG = Learning and Cognition: Styles & Strategies INT RM = Introduction to Research Methods in Psychology RMII = Research Methods II BCD = Biological Cognitive & Developmental Psychology SPID = Social Psychology and Individual Differences ABN PSY = Psychology of Abnormal Behaviour PSY APP = Psychology in Application II DISS = Dissertation COG NEU = Cognitive Neuroscience OCC PSY = Occupational Psychology FOR PSY = Forensic Psychology PSY ED = Psychology in Education AV4 = Level 4 Average AV5 = Level 5 Average AV6 = Level 6 Average GPA = overall award (degree) mark

Table 3.4+ : Means, Standard Deviations, Skewness and Kurtosis for AP L5 modules (L5 cohort)

	RM CW1	RM CW2	RM Exam	BCD CW1	BCD CW2	BCD Exam	SPID CW	SPID Exam	ABN PSY CW1	ABN PSY CW2	ABN PSY Exam
Mean	57.53	59.66	58.27	60.66	60.60	56.50	64.97	60.16	61.65	62.18	56.59
SD	11.52	9.26	21.387	7.42	8.12	12.89	6.43	7.37	6.36	6.88	9.25
SK	-1.073	-.887	-.320	-.351	-.396	-.913	-.694	-.253	-.939	-.697	-.448
Kurtosis	1.182	2.569	-.595	1.181	1.269	1.150	2.593	.054	3.498	1.461	.532

Key: RMCW1 = Research Methods II Coursework 1 RMCW2 = Research Methods II Coursework 2 RM Exam = Research Methods II Exam BCDCW1= Biological Cognitive & Developmental Psychology Coursework 1 BCDCW2 = Biological Cognitive & Developmental Psychology Coursework 2 BCD Exam = Biological Cognitive & Developmental Psychology Exam SPIDCW = Social Psychology and Individual Differences Coursework SPID Exam = Social Psychology and Individual Differences Exam ABN PSY CW1 = Psychology of Abnormal Behaviour Coursework 1 ABN PSY CW2 = Psychology of Abnormal Behaviour Coursework 2 ABN PSY Exam = Psychology of Abnormal Behaviour Exam

Tables 3.1 and 3.2 illustrate the means for Emotional Intelligence; Both cohorts have demonstrated that their emotional intelligence is moderately high on all measures and subscales; there is however dispersion from the mean suggesting individual differences on all measures, even when the different metrics of the four emotional intelligence measures are allowed for. It is interesting that the Assessing Emotions Scale and the Emotional Self-Efficacy Scale are comparable across cohorts; however there are differences on the Trait Meta Mood Scale and the Trait Emotional Intelligence Questionnaire. These differences may relate to an increasing level of emotional maturity from level 4 to level 5, particularly for the Trait Meta Mood Scale which focuses on the perception of intrapersonal skills.

Tables 3.3 and 3.4 illustrate the mean results for academic performance; these are quite narrow for both cohorts. Level 4 (2013) cohort scores range from 58.30 to 62.45; level 5 from 59.25 to 61.70, with very close averages of 60.31 and 60.35 for levels 4 and 5 respectively. The scores for the level 5 (2012) cohort range from 55.10 to 62.16 for level 4; 57.35 to 62.43 for level 5 ad 60.26 to 62.87 for level 6. Average marks increase from 59.12 for level 4, 60.72 for level 5 and 61.54 for level 6, with the mean award mark resting at 62.58. This is an upward trajectory as would be expected, however the scores are not wide ranging.

The standard deviations are adequate suggesting some individual differences, particularly for the Research Methods module consistent with chapter one. As noted previously Research Methods is marked differently to both exams and coursework for other modules as student answers are either right or wrong, with less scope for awarding credit subjectively. The coursework for Research Methods and the coursework and exams for other modules are all written pieces that involve the student developing an argument and supporting this with evidence. For most level 4 modules the mean scores are below the 2:1 level set as a University target for more than fifty percent of students. However, the number of 2:1s (lower range) increases at level 5 and further at 6 leading to a mean classification of 62.58 (lower 2:1).

Table 3.4+ shows the means and standard deviations for a sample of coursework and exam marks for level 5; as expected coursework marks are generally higher than exam grades and there is a slight increment (with the exception of Biological, Cognitive and Developmental Psychology) from coursework 1 to 2.

Table 3.5: Correlations L4 cohort.

	RMI	DEV SOC PSY	LCB PSY	CON ISS PSY	AV4	RMII	BCD	SPID	ABN PSY	PSY APP	AV5	AES	TEIQ	TMMS	ATTEN	CLAR	REPAIR
RM1																	
DEV	.65**																
LCB	.58**	.55**															
CON	.47**	.53**	.54**														
AV4	.83**	.83**	.81**	.76**													
RMII	.65**	.56**	.55**	.55**	.71**												
BCD	.58**	.49**	.55**	.48**	.64**	.61**											
SPID	.53**	.46**	.54**	.47**	.61**	.63**	.60**										
ABN	.48**	.50**	.46**	.38**	.52**	.49**	.42**	.51**									
APP	.35**	.33**	.33**	.32**	.42**	.49**	.46**	.48**	.40**								
AV5	.65**	.60**	.61**	.57**	.74**	.84**	.79**	.80**	.69**	.76**							
AES	.08	.11	.17*	.16*	.17*	.12	.09	.18*	.00	.09	.11						
TEIQ	.03	.02	.08	.02	.03	.01	-.02	.00	-.05	.01	-.01	.63**					
TMMS	.18*	.11	.24**	.11	.19*	.09	.10	.07	.02	.04	.08	.54**	.69**				
ATT	.24**	.14	.28**	.19*	.26**	.19*	.16*	.16*	.07	.04	.16*	.40**	.38**	.77**			
CLAR	.10	.02	.15*	.02	.08	-.02	.03	.01	-.05	.02	-.00	.44**	62**	.88**	.54**		
REP	.09	.11	.10	.04	.09	.05	.04	-.02	.04	.03	.04	.40**	.62**	.61**	.16*	.39**	
ESES	.01	.05	.13	.03	.08	.01	.05	.10	.02	.03	.04	.71**	.58**	.49**	.25**	.49**	.38**

*p<.05 **<.01 For grade keys see tables 3 & 4 Key: AES = Assessing Emotions Scale TEIQ = Trait Emotional Intelligence Questionnaire TMMS = Trait Meta-Mood Scale ATT = Attention CLAR = Clarity REP = Repair (Attention, Clarity and Repair are subscales of the TMMS) ESES = Emotional Self-Efficacy Scale

In table 3.5 it can be clearly seen that three distinct clusters of associations emerge: the inter-correlations between the four emotional intelligence measures; the inter-correlations between the academic performance measures and the cross-correlations between these two inter-correlated clusters. All level 4 modules are moderately correlated in the expected direction and, as expected, each level 4 module is highly correlated with level 4 average (*rs* = .47 to .83). The same pattern is evident for level 5 with the module range showing moderate correlations and moderate to high module average associations. Level 4 grades are moderately to highly associated with level 5; it makes sense that the highest correlation is between Research Methods I (level 4) and Research Methods II (level 5). Level 4 and 5 averages are moderately to highly correlated therefore indicating that if a student does well at level 4 they likely to do well at level 5; however, there is some residual variance left which is likely to be partially accounted for by non-ability individual difference variables.

With regard to the emotional intelligence/academic performance associations, Assessing Emotions Scale is associated with Learning, Cognitive and Biological Psychology, Conceptual Issues in Psychology, level 4 average and Social Psychology and Individual Differences. Trait Meta Mood Scale(total) is associated with Research Methods I, Learning Cognitive and Biological Psychology and level 4 average but nothing at level 5. Attention is associated with Research Methods I, Learning Cognitive and Biological Psychology, Conceptual Issues, level 4 average, Research Methods II, Biological, Cognitive and Developmental PSychology, Social Psychology and Individual Differences and level 5 average, with stronger correlations for level 4. In sum Learning, Cognitive and Biological Psychology is associated with the most emotional intelligence indicators (Assessing Emotions Scale, Trait Meta Mood Scale and its subscales Attention and Clarity). Attention is associated with all level 4 modules with the exception of one which falls just short of significance, and 4 out of 6 modules at level 5, in addition to level 5 average.

The three subscales of the Trait Meta Mood Scale are highly correlated with the total scale (*rs* = .61 to .88) as might be expected. The Trait Meta Mood Scale is moderately to highly related to Emotional Self-Efficacy Scale, Asessing Emotions Scale and Trait Emotional Intelligence Questionnaire (*rs* =.49 to .69). The Trait Emotional Intelligence Questionnaire is related to its three counterpart scales in a slightly broader range (*rs* = .38 to .69). The range of associations of Assessing Emotions Scale and their counterparts are (*rs* =.54 to .71) and (*rs* =.49 to .71) respectively. These support the concept of concurrent or convergent validity between the measures and suggest that although there is clear commonality

between them, each offers a distinct or unique element. The subscales of the Trait Meta Mood Scale present a weaker range of associations with each other (*rs* = .16 to .54), indicative of their distinctiveness. The subscales of this measure are presented because it is the only measure that addresses intra-personal emotional intelligence exclusively.

Table 3.6: Associations between level 4,5, 6 grades, overall award mark and EI/AP (level 5 cohort)

	Intro Psy	Soc Psy	HM Psy	Dev Psy	L & Cog	Intro RM	RMII	BCD	SPID	Abn Psy	Psy App	Diss	Cog Neu	Occ Psy	For PSy	Psy Ed	AV4	AV5	AV6	GPA	AES	TEIQ	TMS	ESE	ATT	CLAR
Soc	.12																									
HM	.32**	.17*																								
Dev	.12	.09	.32**																							
L&C	.40**	.24**	.42**	.18**																						
RMI	.24**	.16*	.19**	.32**	.29**																					
RMII	.35**	.32**	.42**	.33**	.32**	.17*																				
BCD	.27**	.24**	.33**	.32**	.43**	.23**	.48**																			
SPID	.28**	.30**	.30**	.17*	.21**	.13	.39**	.40**																		
Abn	.32**	.35**	.31**	.25**	.40**	.18**	.48**	.45**	.35**																	
App	.24**	.30**	.27**	.14*	.34**	.17*	.43**	.44**	.36**	.53**																
Diss	.22**	.29**	.32**	.31**	.33**	.27**	.47**	.33**	.38**	.44**	.53**															
Cog	.14*	.29**	.28**	.28**	.26**	.15*	.53**	.40**	.20**	.47**	.33**	.40**														
Occ	.26**	.16*	.22**	.29**	.26**	.24**	.44**	.46**	.36**	.32**	.40**	.43**	.34**													
For	.17*	.31**	.30**	.28**	.37**	.25**	.40**	.37**	.26**	.47**	.37**	.44**	.45**	.30**												
P Ed	.13	.15*	.16*	.07	.22**	.12	.32**	.26**	.17*	.27**	.38**	.35**	.31**	.32**	.31**											
AV4	.51**	.38**	.61**	.56**	.72**	.54**	.57**	.54**	.37**	.53**	.43**	.54**	.44**	.43**	.52**	.23**										
AV5	.38**	.35**	.44**	.26**	.52**	.26**	.58**	.66**	.52**	.62**	.68**	.52**	.45**	.53**	.45**	.43**	.65**									
AV6	.28**	.31**	.38**	.32**	.46**	.29**	.59**	.51**	.36**	.54**	.56**	.72**	.67**	.64**	.63**	.60**	.62**	.71**								
GPA	.33**	.36**	.42**	.36**	.45**	.31**	.65**	.60**	.47**	.63**	.66**	.73**	.66**	.62**	.65**	.55**	.67**	.79**	.907**							
AES	-.04	.057	.01	.00	-.02	-.08	.02	-.05	-.11	.00	.02	.02	-.02	.03**	-.01	.03	-.03	-.04	.009	.04						
TEIQ	-.02	.16*	.08	.08	.07	.01	.12	.06	-.06	.13	.07	.12	.12	.03**	.08	.09	.10	.07	.110	.14*	.52**					
TMS	.01	.09	.09	.13	.01	.09	.14*	.12	.03	.12	.10	.09	.14*	.03	.11	.03	.11	.08	.119	15*	.45**	.66**				
ESE	-.07	.10	.04	.12	.00	.01	.06	.09	-.04	.12	.01	.10	.03	.05	.07	-.02	.08	-.02	.026	.10	.52**	.55**	.52**			
ATT	.03	.07	-.01	.11	-.04	.06	.11	.06	-.00	.11	.13*	.05	.13	.02	.06	.07	.03	.06	.124	11	.20**	.24**	.68**	.13*		
CLA	-.09	.08	.078	.13	-.02	.08	.09	.09	-.01	.07	-.03	.01	.10	-.01	.04	-.08	.09	.01	.007	.06	.36**	.57**	.70**	.49**	.09	
REP	.10	.10	.13	-.00	.10	.07	.10	.11	.10	.07	.12	.16*	.03	.08	.15*	.08	.13	.11	.125	.16*	.37**	.58**	.67**	.48**	.24**	.28**

Key – see tables 3.3, 3.4 and 3.5.

Table 3.7: Correlation Coefficients for EI and level 5 module grades (level 5 cohort)

	RMII cw1	RMII cw2	RMII exam	BCD cw1	BCD cw2	BCD exam	SPID cw	SPID exam	ABN PSY cw1	ABN PSY cw2	ABN PSY exam
AES	.025	-.041	.102	.083	-.035	-.080	-.036	-.074	-.037	-.018	.019
TEIQ	.080	.126	.180**	.074	.063	.009	.005	-.022	.088	.101	.058
TMMS	.138*	.114	.140*	.049	.048	.127	.013	-.023	.062	.028	.059
ESES	.014	.007	.109	.048	.051	.094	-.035	-.038	.110	.047	.053
ATTENTION	.055	.163*	.026	-.071	-.071	.062	-.124	.016	.062	.001	.096
CLARITY	.093	.028	.165*	.082	.098	.128	.047	-.050	-.001	.081	.006
REPAIR	.150*	.033	.093	.107	.083	.062	.141*	-.010	.076	-.042	.014

Key – see tables 3.4+ and 3.5.

Table 3.6 indicates that most level 4 modules are low to moderately correlated in the expected direction (*rs* = .16 to .42) and each level 4 module is moderately correlated with level 4 average (*rs* = .51 to .72). All level 5 modules are moderately correlated with each other (*rs* = .35 to 53) and with moderate level averages (*rs* = .52 to .66). The same module pattern is evident for level 6 with moderate module (*rs* = .30 to .45) and level average associations (*rs* = .60 to .72). Level 4 grades are low to moderately associated with 5 and 6 (*rs*=.14 to .43). Levels 5 and 6 modules also have low to moderate associations (*rs* = .17 to .53) and level 4, 5 and 6 averages are moderately to highly correlated with each other (*rs* = .62 to .70). Furthermore average mark at level 4 is moderately to highly associated with levels 5, 6 and overall Grade Point Average (*rs* =65, .62 and .67 respectively). Average 5 is associated with average 6 and Grade Point Average (*rs* = .71 and .79 respectively) and finally level 6 average is associated with overall award mark (r = .907). As previously stated this trajectory from levels 4 to 6 is as expected with most of the variance in overall award mark (Grade Point Average) coming from level 6. As expected all modules are associated with Grade Point Average with correlations increasing from levels 4 to 6.

With regard to the emotional intelligence/academic performance associations, the Trait Emotional Intelligence Questionnaire is associated with Research Methods I and overall award mark. The Trait Meta Mood Scale total is associated with Research Methods II, Cognitive Neuroscience and Grade Point Average. Attention is only associated with Psychology in Application II and Repair comes into play in level 6 and is associated with the Dissertation module, Forensic Psychology and overall award mark (Grade Point Average). The Assessing Emotions Scale and Emotional Self-Efficacy Scale have no associations with academic performance for this cohort.

With regard to the inter-correlations between the emotional intelligence measures all measures are moderately associated; the Trait Meta Mood Scale and its subscales are low to moderately associated with the exception of clarity and attention which are not associated. This demonstrates a distinction between each subscale of the Trait Meta Mood Scale and its total (see previous description of table 5 for further detail).

Whilst the broader correlations only show Research Methods to be associated with the Trait Meta Mood Scale, by considering emotional intelligence in relation to specific outcomes (coursework and exam)(table 3.7) it can be seen that RM2 is associated with the Trait Emotional Intelligence Questionnaire, the Trait Meta Mood Scale and its subscales

Attention, Clarity and Repair. Specifically, Research Methods II exam is associated with the Trait Emotional Intelligence Questionnaire and Clarity, whereas Research Methods coursework 1 is associated with Trait Meta Mood Scale total and Repair and Research Methods coursework 2 is associated with Attention. The only other apparent association is between Repair and Social Psychology and Individual Differences.

Regression Analyses: Level 4 cohort grades

Based on the correlations above the following regression analyses were conducted.

Level 4 Average was regressed on the Trait Emotional Intelligence Questionnaire, Trait Meta Mood Scale(t) and Attention; the multiple regression revealed the variance in level 4 average is coming from Attention accounting for 6% of the variance in academic performance ($f(3,176)=6.989$, $p<.001$, Adj. $R^2 = .063$. Hierarchical regression revealed the same pattern.

The following multiple regression regressed Learning, Cognitive and Biological Psychology on Assessing Emotions Scale, Attention and Clarity and revealed the majority of the variance was coming from Attention accounting for 7% of the variance in Learning, Cognitive and Biological Psychology ($f(3,175) = 5.303$, $p<.01$, Adj. $R^2 = .068$. Hierarchical regressionrevealed a similar pattern but with Assessing Emotions Scale accounting for 2% of the variance ($f(1,176) = 4.966$, $p<.05$, Adj. $R^2 = .022$ and Attention accounting for a further 5% ($f(1,176) = 10.699$, $p<001$, Adj. $R^2 = .073$. Clarity was non-significant.

The third multiple regression for this cohort regressed Research Methods II on Assessing Emotions Scale and Attention. The multiple regression revealed that the main variance was coming from Assessing Emotions Scale ($f(2,176)=3.851$, $p<.05$, Adj.$R^2 = .031$ and so Assessing Emotions Scale accounted for 3% of the variance in Research Methods II.

Regression Analyses: Level 5 cohort grades

The correlations were not systematic enough for the level 5 cohort to conduct MRs but Grade Point Average was regressed on the Trait Emotional Intelligence Questionnaire, Trait Meta Mood Scale(total) and Repair. Hierarchical regressionrevealed the variance was coming from the Trait Emotional Intelligence Questionnaire ($f(1, 218) = 4.441$, $p<.05$, Adj. $R^2 = .015$ so accounting for 1.5% variance in Grade Point Average (overall award mark).

With regard to the specific scores awarded in level 5, the correlations revealed Research Methods II to be associated with emotional intelligence; to this end the following regressions were conducted. Research Methods II, coursework 1 was regressed with Trait Meta Mood Scale(total) and Repair; hierarchical regressionrevealed the majority of the variance was coming from the Trait Meta Mood Scale(total) accounting for 1.5% of the variance ($f(2,213) = 4.134$, $p<.05$, Adj. $R^2 = .015$.

Hierarchical regressionwas conducted with Research Methods exam on the Trait Meta Mood Scale(total) and Clarity; As with coursework 1, the Trait Meta Mood Scale(total) accounted for 1.5% of the variance ($f(1,213) = 4.263$, $p<.05$, Adj. $R^2 = .015$.

Cohort Comparison Results

Table 3.8: Means, Standard Deviations, Skewness, Kurtosis and MANOVA levels for Emotional Intelligence (combined Cohorts).

COHORT	DESCRIPTIVES	Mean(mid points)	SD	SKEWNESS	KURTOSIS	F Test (univariate)
UK 2011	TEIQ	148.25 (120)	20.84	-.416	.093	F(4,956) = 90.70 **
	TMMS(t)	109.76 (90)	13.02	-.324	-.219	= 137.39**
	ATTENTION	47.43 (39)	7.05	-.364	.190	= 162.62 **
	CLARITY	40.26 (33)	6.39	-.343	.199	= 37.95 **
	REPAIR	22.07 (18)	5.14	-.754	.041	= 26.47 **
UK 2010	TEIQ	146.21	20.75	-.425	.899	
	TMMS(t)	109.52	13.66	-.411	.020	
	ATTENTION	47.82	6.68	-.638	.242	
	CLARITY	39.67	7.13	-.262	.095	
	REPAIR	22.03	4.49	-.740	.416	
UK 2009	TEIQ	148.17	19.31	-.206	.369	
	TMMS(t)	109.37	13.15	-.823	1.738	
	ATTENTION	48.20	6.40	-1.141	2.815	
	CLARITY	39.16	7.10	-.713	1.143	
	REPAIR	22.01	4.60	-.606	-.054	
UK 2012	TEIQ	117.26	9.20	.172	.741	
	TMMS(t)	84.96	7.20	1.139	3.473	
	ATTENTION	33.34	4.92	1.003	1.893	
	CLARITY	33.37	3.19	.444	1.811	
	REPAIR	18.26	2.86	-.006	.250	
UK 2013	TEIQ	138.53	18.95	-.246	-.206	
	TMMS(t)	103.87	12.77	-.072	-.515	
	ATTENTION	45.28	5.46	-.262	-.161	
	CLARITY	38.30	6.50	-.127	-.276	
	REPAIR	20.29	4.33	-.274	-.373	
Multivariate F(16, 2890.72) = 42.72, p<.001, Wilk's λ =.523**						**=p<.01

Table 3.8 illustrates the means for Emotional Intelligence for the Psychology cohorts (2009 to 2013). All groups with the exception of the 2012 cohort have scored above the midpoint for both measures and their subscales, with the exception of the 2012 cohort which has scored just below the midpoint for both the Trait Emotional Intelligence Questionnaire and the Attention subscale of the Trait Meta Mood Scale; whilst the 2012 cohort have scored lower than the other cohorts on all items they are still around the midpoint suggesting normal emotional intelligence. The other cohorts have scored higher than the midpoint suggesting positive endorsement of emotional intelligence. There is good variance around the means suggesting expected individual differences; for the Trait Emotional Intelligence Questionnaire however. The 2012 cohort variance is much tighter than all other cohorts suggesting emotional intelligence is lower in this cohort.

Table 3.8 also demonstrates the main effects of a multivariate analysis of variance. There was a significant main effect for the differences between cohorts and there were significant differences for all measures (see F values in table above). Post hoc tests reveal that all significant differences were related to the 2012 cohort as indicated by the means and significant post-hoc tests ($p<.01$) and with this group scoring significantly lower on the emotional intelligence measures and their subscales than all other cohorts.

The good quality of the data is demonstrated with low levels of skewness and kurtosis (range: -.006 to -1.139 and .093 to – 1.738) for skewness and kurtosis respectively, therefore not departing from normality (>1.96). Further, all assumptions were met for the multivariate tests, with the exception of homogeneity of variance ($p<.001$); results therefore should be interpreted with due caution. Each emotional intelligence measure and the subscales of the Trait Meta Mood Scale elicited high reliabilities (α = .84, .79, .79, .72 and .69) for the Trait Emotional Intelligence Questionnaire, Trait Meta Mood Scale, Attention, Clarity and Repair respectively.

3.4 Discussion

The main aim of the current chapter was to determine if emotional intelligence was associated to academic performance consistently or whether various aspects of emotional intelligence related to various aspects of academic performance. Findings confirm that the path from emotional intelligence to academic performance is not straight forward; whilst some associations were found correlations were low (H_1), yet consistent with previous research (Adeyemo, 2007; Austin, 2005; Barchard, 2003; Bracket & Mayer, 2003; Chew, Zain & Hassan, 2013; Downey, Mountstephen, Lloyd, Hansen & Stough, 2008; Lam & Kirby, 2002; Parker et al., 2004; Schutte et al, 1998). Mixed results have been confounded by the use of different emotional intelligence measures across studies; this study sought to demonstrate whether there was consistency across some of the more well-known inventories ($H_{2/3}$). The findings revealed that the most robust indicator of academic performance is Attention (a subscale of the Trait Meta Mood Scale); this is consistent with research by Yazici, Sayis and Altun (2011) who found that the 'being aware' aspect of emotional intelligence was related to academic performance. Attention was followed by the Assessing Emotions Scale, the Trait Meta Mood Scale total and the Trait Emotional Intelligence Questionnaire; the Emotional Self-Efficacy Scale was not a valid predictor of grades. As highlighted, it has been suggested that some measures of emotional intelligence do not relate to performance; this is possibly due to measurement difficulties, in terms of the appropriate range of content validity. It is however somewhat surprising that Emotional Self-Efficacy Scale was not associated with academic performance as existing within the emotional intelligence construct is self-efficacy (Qualter et al., 2012). In the educational context Bandura (2001) suggests that beliefs about Emotional Self-Efficacy Scale are likely to influence self regulation actions during learning activities including revision, effort, resilience, both academically and non-academically. Further, the principle deems that the behaviours adopted by an individual and the associated outcome (i.e., passing or failing an exam) influences future responses in similar situations. Perhaps a more proximal measure such as self-efficacy (as discussed in chapter 3) is more appropriate in measuring direct associations with academic performance. Further, low correlations of the other emotional intelligence measures with academic performance may also be due to them not being specifically designed to measure academic performance (O'Connor and Little, 2003).

As established through the review of the literature, different findings can also depend on how academic performance is operationalised (Agnoli, et al., 2012; Jaeger & Eagan, 2007). This study sought to overcome this issue by including varying academic performance measures. Consistent with previous research (Austin, Evans, Goldwater & Potter, 2005; Agnoli et al., 2012; Mavroveli & Sanchez-Ruiz, 2011; Rodeiro et al., 2012) emotional intelligence was found to be associated with limited academic performance outcomes. Further the current study found that Level 4 students tapped into their emotional intelligence resources more than Level 5, this is consistent with research that has found emotional intelligence is endorsed differentially during different periods of education, for instance Ebrahimi (2013) found emotional intelligence was utilised during the adjustment (transition) period of university but not during the summer period. It could be that tapping into emotional intelligence is necessary during periods of adjustment but when students have settled into the programme and can focus their efforts on academia, emotional intelligence is utilised less. This may be because significant challenges are presented in the first year of university and there is a need to adjust to a new educational, social, environmental and cultural milieu and to manage academic demands with non-academic (Upcraft, Gardner & Barefoot, 2005; Rode et al., 2007). It is unfortunately the case that students who do not adjust to the first year often withdraw from university during the first 6 months or they go on to perform academically poorer than their more well-adjusted peers, eventually withdrawing (Tinto, 1993; Parker et al., 2006). Whilst in the second year, students will have passed the first year and possibly feel more confident, self-efficacious and secure, thus being able to concentrate their efforts on their studies, with less need to tap into their emotional intelligence resources. Students who persist into the final year are likely to be adept at adjustment and adaption and these are encompassed with Bar-ons (2000) operational definition of emotional intelligence. Rode, Mooney and Arthaud-Day et al., (2007) suggest that individuals need to be motivated to use their emotional intelligence resources. Nevertheless, emotional intelligence was again utilised at level 6.

In accordance with H_4, interestingly Repair only came into play at level 6 and was associated with two of the biggest level 6 modules (Dissertation and Forensic Psychology) and with overall award mark. This is consistent with Fernandez-Berrocal and Extremera, (2006); Pau et al., (2007) and Ebrahimi, (2013) who suggested emotional intelligence is endorsed more effectively when stress levels are highest. This may be particularly relevant to Repair as the dissertation is an ongoing project and so it is necessary to recover from

setbacks; also level 6 is considered to be the most stressful year, with an increased and more focused workload and not least because it counts towards 75% of a students mark. Further, it is interesting to note that emotional intelligence for the level 5 cohort was related mainly to statistics; this is a subject that is feared by many students, so eliciting a high level of anxiety (Onwuegbuzie & Wilson, 2003; Onwuegbuzie, Leech, Murtonen, & Tähtinen, 2010) and so where emotional intelligence, particularly Trait Meta Mood Scale(total) may prove useful; the fact that Trait Meta Mood Scale was the strongest predictor here (although low at 1.5%) suggests elements of each subscale (attention, clarity and repair) are pertinent to statistical success. This also highlights the benefit of considering individual assessments in addition to wider module totals and Grade Point Average, where associations can be missed (H_4).

Cohort comparison

With regard to the cohort comparison data, whilst all cohorts were in the normal range, with the exception of the 2012 cohort who scored uncharacteristically lower than previous groups. Whilst the 2012 group was lower they still scored within the normal range and slightly above midpoint suggesting marginally positive emotional intelligence. All scores on the emotional intelligence measures are still within the positive scale parameters.

Limitations

The groups are fairly homogenous in that all students studied combined or Applied Psychology and were mainly female; using cohorts from across different Schools may increase the generalisability of the results. Issues surrounding self-report were tempered somewhat by the inclusion of objective performance measures. Further, it is suggested that emotional experience is subjective and so self-reports would be the best way to capture an individual's perception of their emotional intelligence as supported by Petrides (2011). Longitudinal results also reduce the likelihood that results are spurious, incidental or only relevant at particular levels. Longitudinal analyses were recommended by Mavroveli and Sanchez-ruiz (2010; 2011) and employed in the current study in relation to academic performance. A further possible limitation could be that personality was not measured in addition to emotional intelligence; however, this has been studied extensively and has shown low to moderate association, with emotional intelligence showing incremental validity (e.g., Di Fabio & Palazzeschi, 2009; Ferrando, Prieto & Almeida et al., 2010; Mayer et al., 2003; Petrides et al., 2007; Petrides, 2011; Qualter et al., 2012; Sanchez-Ruiz

et al., 2013). Finally, it is possible that students may over/underestimate their emotional intelligence; Zeidner, Shani-Zinovich, Matthews and Roberts (2005) found that gifted students who scored high on an emotional ability test rated their emotional intelligence as low, perhaps indicating a lack of confidence in their own abilities; this may be balanced out by tertiary education however, as the mean score for emotional intelligence was moderately high across groups.

Future recommendations

As Mayer, Salovey and Caruso (2004) suggest for ability emotional intelligence; it would be useful to study trait emotional intelligence in relation to varying age groups to consider whether it has a developmental course; emotional intelligence may well be more pertinent to tertiary education than primary or secondary when emotions are more developed, academic demands higher, and intelligence less reliable in predictive validity. Longitudinal studies across the academic lifespan would be beneficial in this regard. Emotional intelligence may also depend on the context in which it is being studied, as suggested by Derksen et al., (2002) and Cherniss (2010). Emotional imtelligence may be more relevant in certain situations and this could be why only certain modules were associated; it is possible that emotional intelligence is applied more effectively in relation to these. Future research might consider the requirements of the modules, rather than general academic performance. Further, Jain (2012) suggests emotional intelligence shows the potential for performance, not the performance itself; establishing that these students had higher than average emotional intelligence is an indication they may be applying emotional intelligence to their studies and to enhance their overall student experience.

Whilst Psychology students are high on emotional intelligence this is appropriate to their chosen study domain, it is necessary to be cooperative with individuals, and have a positive, pro-social and supportive nature (Zeidner, Roberts & Matthews, 2008) and this may not be the case for students on other programmes; future research would benefit from considering the level of emotional intelligence across varying majors. It may be that emotional intelligence is applied and developed throughout the Psychology programme (Ross, Powell & Elias, 2002; Sanchez-Ruiz, 2013) but not in others, such as Engineering where emotional intelligence may be lower as it is not a people focused programme. Future research could investigate this probability. Zeidner et al., (2008) suggest it may be that emotional intelligence is associated with academic performance in studies such as social

science but not more technical programmes. Sanchez-Ruiz et al., (2013) compared emotional intelligence across different Schools, however their sample sizes were low (*N*=323 across six majors; range 30-89 for each programme). Future research could also consider the unique validity of emotional intelligence in differing cohorts above and beyond Personality. This would augment previous research and develop the themes included in this chapter.

Emotional intelligence is positively associated with motivation, decision-making, critical thinking, good time-management, planning and self-regulated learning (Fernandez, Salamonson & Griffiths, 2012; Ferrando et al., 2010). It is also conducive to coping behaviours (Low & Nelson, 2006; Mavroveli & Sanchez-Ruiz, 2010) which could lead to a successful university experience. In line with Petrides, Frederickson and Furnham (2004) this research considers what emotional intelligence explains in addition to what it predicts; whether or not emotional intelligence has incremental validity, on its own it is still a meaningful variable in the explanation of not only academic performance but of the academic experience and the process of attainment, rather than simply the outcome. The inclusion of emotional intelligence in tertiary education may be of particular importance for individuals vulnerable to academic failure or ill-being; it may also be useful for students who are struggling to cope with the demands of academia. Future research might consider whether emotional intelligence is utilised more with students who are also juggling other commitments around their studies, such as work demands and family pressures.

Whilst emotional intelligence is considered a trait and the term intelligence implies it is fixed (Humphrey et al., 2007), emotional intelligence can be taught, and is also considered to develop throughout life (Amelang & Steinmayr, 2006; Bar-On, 2000; Brackett, Rivers, Reyes & Salovey, 2010; Brackett et al., 2011; Pool & Qualter, 2012; Zeidner, Matthews, Roberts & McCann, 2003); It has shown to be malleable with efforts to improve it successful (Nelis, Quoidbach, Mikolajczak & Hansenne, 2009). Although Zeidner et al., (2008) question the theoretical grounding, construction, implementation and assessment of such interventions, numerous studies have shown effectiveness in increasing emotional intelligence and well-validated intervention programmes to improve education have been developed (Meyer, Fletcher & Parker, 2004). Identifying emotional intelligence is associated with level 5 statistics and with the main modules at level 6 may be important in developing interventions, particularly for statistics, where students struggle and anxiety

levels are high, thus it may prove useful to tailor interventions to the needs of particular groups depending upon their emotional intelligence profile (Sanchez-Ruiz, Perez-Gonzales & Petrides, 2010).

Summary

The aim of the current chapter was to determine if emotional intelligence was associated with academic performance consistently or whether various aspects of emotional intelligence related to various aspects of academic performance. Findings confirm that the path from emotional intelligence to academic performance is not straight forward. Whilst some associations were found correlations were low. Therefore, it is suggested that although emotional intelligence may not be the most robust predictor of academic performance, there is some value in assessing this criterion and attempting to increase the emotional intelligence of students through suitable intervention programmes; this may only have a small impact on their grades but may make their time at university more manageable and set them on the right path towards their intended careers. Research has shown that emotional intelligence has been associated with career commitment and success (Dahl, Austin Wagner & Lukas, 2008; Mohzan et al., 2013; Puffer, 2011), adaptability within the workplace (Coetzee & Harry, 2013), career decision making (Di Fabio, Palazzeschi, Asulin-Perets & Gati, 2013), managing conflict and stress within the workplace (Lopes, Cote & Salovey, 2006) and job satisfaction (Brackett, Palomera Mosja, Reyes & Salovey, 2010; Sporrle, Welpe & Forsterling, 2006). Emotional intelligence has also been associated with life satisfaction (Bastian et al., 2005; Schutte et al., 2001; Law, Wong, & Song, 2004; Wong & Law, 2002), optimism (Schutte 1998) and negatively with depression and anxiety (Bastian et al., 2005; Dawda & Hart, 2006). Individuals attuned to emotional intelligence have shown to be receptive and responsive to emotional intelligence training (Slaski & Cartwright, 2003). With evidence that emotional intelligence can be taught and developed it is proposed that emotional intelligence is addressed within tertiary education to increase a student's chances of academic success, future career management, success and satisfaction.

According to Ross, Powell and Elias (2002) and Rodeiro et al., (2012) it important for educators to help develop students personal, social, emotional and academic needs; indeed many secondary schools in the UK have developed curriculum materials that support the development of social, behavioural and emotional skills (DfES 2005; 2007). Whilst this

addresses the needs of school age children, it is important also for university educators to consider and is perhaps more crucial at the time they are transitioning to adulthood and preparing for their future careers. Consistent with the results here, Zeidner, Roberts and Matthews, (2008) report correlations between emotional intelligence and academic performance to be small (around .10). It could be argued that regardless of the ability and academic performance of students, it is necessary for students to cope with everyday demands, pressures and anxieties; emotional intelligence is an important factor in this regard (Yazici et al., 2011). It is important for students to develop as individuals and to contribute to the social, emotional and political milieu (Zargar & Ganai, 2013; Zeidner et al., 2008); understanding and managing one's own and others emotions may go some way toward developing well rounded beings that are able to contribute to society in meaningful ways, and specifically for students it may enable focus on learning, rather than being consumed with emotional distractions and difficulties which in turn could be barriers to learning (Zeidner et al., 2008). Further, as emotional intelligence has a limited impact on academic performance, perhaps its design is more equipped to tap into aspects of other important variables in the education process such as student wellbeing and quality of life, rather than something as objective as academic performance. To this end the following chapter will explore this possibility.

In conclusion the following highlights some significant contributions to knowledge:

1. At the level of literature this chapter has synthesised and updated the diverse strands of literature and integrated them into a coherent overview of where the emotional intelligence map currently stands in relation to theory and practice.

2. A unique feature of this study is the amalgamation of four emotional intelligence measures in one study to provide a good, broad range of the emotional intelligence constructs that covers the inter-personal and intra-personal aspects and allows for the testing of their convergent validity and unique aspects.

3. The predictive map related to emotional intelligence has emerged as chequered from previous research and this study can only contribute to that by a more comprehensive and authoritative test within a single study. This was achieved through the use of 4 emotional intelligence measures across three cohorts of students and by a variety of performance indicators and performance averages.

4. The general stability and consistency of the measures across the cohorts engenders confidence for normed referencing which will be useful for future reflective PDP work at both nomothetic and ideographic levels. The breadth of the content within the measures maximally highlights important educational/pedagogical aspects embodied within emotional intelligence including retention, adjustment, adaptation, anger management, conflict resolution, resilience, motivation, people skills, employability etc.

Chapter 4

The predictive validity of emotional intelligence in relation to wellbeing and quality of life: beyond personality.

Abstract

Research into Emotional Intelligence and Wellbeing has been rapidly growing; however varying measures and other methodological limitations show a chequered pattern of results. The current study attempts to overcome several limitations by combining a bank of emotional intelligence measures with a bank of wellbeing and quality of life measures in order to assess predictive validity beyond personality. Further, student responses are aligned with a cluster of academic performance indicators. Findings show that the Trait Emotional Intelligence Questionnaire is the most robust predictor of wellbeing and quality of life, whilst the Trait Meta Mood Scale clarity and repair subscales come a close second. The main association from the personality variables with wellbeing was Emotional Stability. The emotional intelligence variables showed incremental validity in wellbeing above and beyond that accounted for by personality including the strongest predictor, emotional stability. Overall the results confirm the value of emotional intelligence as a mental wellbeing and quality of life predictor. With regard to academic performance wellbeing was selectively associated with some but not all academic outcomes; it is suggested that there is a reciprocal relationship between wellbeing and academic performance. The findings and implication of this research are discussed and future recommendations provided.

4.1 Introduction

The theories of Emotional Intelligence and wellbeing propose that individuals with higher levels of emotional intelligence will experience higher levels of psychological wellbeing as they are able to maintain positive mental states due to their ability to recognise, understand, manage, control, and regulate their emotions (Salovey & Mayer, 1990; Mayer & Salovey, 1997; Schutte, Malouff, & Simunek et al., 2002). Recognising emotions involves being able to perceive emotional cues accurately; understanding entails knowledge about the complexities and subtleties involved in emotional experience; clarity of thought allows adaptive management of moods and is thought to lead to the ability to terminate aversive moods quickly, and management includes being able to regulate emotions effectively in

order to stop negative rumination and focus on balancing mood in order to repair a positive mood state (Schutte & Malouff, 2011; Palmer, Donaldson & Stough, 2002). In addition to academic performance, emotional intelligence has been associated with other important life criteria, for instance career success, adaptability and managing conflict and stress within the workplace (Brackett, Palomera, Mosja, Reyes & Salovey, 2010; Lopes, Cote & Salovey, 2006). It has also been associated with health variables such as decreased smoking and smoking cessation (Limonero, Thomas-Sabado & Fernandez-Castro, 2006; Trinidad, Unger, Chou & Johnson, 2005); adjustment to diagnoses (Schmidt, Andrykowski & Michael, 2004) and the ability to manage stress (Fernandez-Berrocal & Extremera, 2006).

Whilst emotional intelligence may have a small (but important) impact upon a person's academic performance; it is envisaged to play an important role in a person's success, future career prospects and overall life satisfaction (Brackett et al., 2011; Chamorro-Premuzic, Bennett & Furnham, 2007; Sanchez-Ruiz, Mavroveli & Poulis, 2013; Petrides, Pita & Kokkinaki, 2007). As emotional intelligence is conducive to recognising, expressing, managing and regulating moods, in addition to more effective coping strategies, having stronger social networks and support, a lower propensity to experience negative and a higher ability to maintain positive emotions, it is expected that higher emotional intelligence individuals would experience lower levels of distress and experience better wellbeing (Koydemir & Schutz, 2012; Mikolajczak, Nelis, Hansenne & Quoidbach, 2008; Zeidner, Matthews & Roberts, 2012). According to Bar-On (1997), emotional intelligence has shown to have a direct impact on an individual's wellbeing including greater life satisfaction, positive affect or subjective wellbeing (e.g., Chamorro-Premuzic, Bennett & Furnham, 2007; Gallagher & Vella-Broderick, 2008); indeed emotional intelligence has been associated with general, physical and psychological wellbeing (e.g., Bastian, Burns & Nettlebeck, 2005; Brackett & Mayer, 2003; Brackett, Mayer & Warner, 2004; Gupta & Kumar, 2010; Mikolajczak, Luminet & Menil, 2006; Tsaousis & Nikolaou, 2005; Schutte, Malouff, Simunek, McKenley & Hollander, 2002). Meta-analyses by Martins, Ramalho and Morin (2010), Schutte, Malouff, Thorsteinsson, Bhullar and Rooke, (2007) and a review by Zeidner, Matthews and Roberts (2012) concluded that emotional intelligence is positively associated with psychological wellbeing and negatively with affective disorders including anxiety and depression. However numerous studies are correlational and do not

assess predictive validity (Martins et al., 2010; Mavroveli, Petrides, Rieffe & Bakker, 2007; Schutte et al., 2007).

Emotional intelligence and wellbeing has mainly been considered in relation to adult samples including wellbeing in the workplace (Carmeli, Yitzhak-Halevy & Weisberg, 2007), several studies have also analysed student populations. The present study seeks to contribute to research into the impact of emotional intelligence on wellbeing variables by extending student studies as this is a particularly stressful time in an individual's life and is an indicator of the how their wellbeing and quality of life will be as adults (Koydemir & Schutz, 2012). With regard to students particularly, responsibilities, increasing challenges, stress, high workload and balancing studies with other commitments (work, home, social) can overburden them and ultimately affect their academic performance; more importantly their wellbeing and quality of life can be impaired at this crucial stage (Austin, Saklofske & Mastoras, 2010). Mood regulation in particular has been associated with the ability to manage academic stressors and avoid negative rumination (Austin et al., 2010; Saklofski, Austin, Mastoras, Beaton & Osborne, 2012). Extremera and Berrocal (2006) conducted a study on a student sample and found attention to feelings was positively associated with high anxiety levels, whilst clarity and repair were associated with lower levels of anxiety and depression. Poor regulation has been associated with paying negative attention to feelings and negative rumination, reckless, impulsive actions and social disconnection (Wells, 2000; Zeidner et al., 2012).

Emotional intelligence has shown to be associated to wellbeing and in turn it is envisaged that student emotional intelligence and wellbeing will be associated with better quality of life. However, whilst emotional intelligence has been directly associated with Life Satisfaction (Bastian, Burns & Nettlebeck, 2005; Ciarrochi, Chan & Caputi, 2000; Palmer, Donaldson & Stough, 2002; Brackett & Mayor, 2003; Brackett et al., 2006; Carmeli et al., 2007), these studies did not control for personality variables. Not all research has found that emotional intelligence is linked to wellbeing and quality of life; Bond and Donaldso-Feilder (2004) found that once acceptance and job control was accounted for emotional intelligence was no longer significant in predicting wellbeing in the workplace; however, only one measure of mental wellbeing was used. James, Bore and Zito (2012) found emotional intelligence was not predictive of wellbeing (depression and satisfaction with life) over the Emotional Stability factor of personality in a moderate (N=150) sample of law students. Critics have argued that emotional intelligence may be redundant when used

in combination with personality to measure outcome variables (Brody, 2004; Landy, 2005; Schulte, Ree & Carretta, 2004). Despite this, little research relating to wellbeing and quality of life has controlled for the effects of personality (Zeidner et al., 2010); of those that have, personality has been considered in relation to limited wellbeing outcomes. Davis and Humphrey (2012) found incremental validity in emotional intelligence beyond personality in predicting depression; Palmer, Donaldson and Stough (2002) found emotional intelligence predicted variance in satisfaction with life above positive and negative affect; Schutte and Malouff (2011) in subjective wellbeing above mindfulness, and Gardner and Qualter (2010) found emotional intelligence showed incremental validity in predicting satisfaction with life above personality. Chamorro-Premuzic et al., (2007) found emotional intelligence was the strongest incremental predictor of happiness, although personality was measured with only a short-form inventory leaving 2 items per factor. Furnham and Christoforou (2007) however found the same using a longer measure of personality; emotional intelligence was a stronger predictor than emotional stability and extraversion. In contrast, Austin, Saklofske and Egan (2005) found that emotional intelligence offered no incremental validity beyond personality in satisfaction with life; there were stronger associations with Personality (emotional stability) than emotional intelligence.

Of the Personality variables Emotion Stability (Neuroticism in its negative form) has shown the highest associations with emotional intelligence, followed by Extraversion and smaller but significant correlations with Conscientiousness, Agreeableness and Openness (Austin, Saklofske & Mastoras, 2010; Dawda & Hart, 2000; Petrides & Furnham, 2001; Saklofski, Austin & Minski, 2003). Correlations with emotional stability particularly are not surprising as emotional stability has been associated with better coping skills, better mood regulation and management and the propensity to experience more positive emotions; thus neuroticism has shown to be related to negative emotions, maladaptive coping and psychological distress (Austin, Saklofske & Mastoras, 2010), whereas extraversion is associated with positive mood and mood regulation (Austin et al., 2005; Chamorro-Premuzic, Bennett & Furnham, 2007; Saklofske, Austin & Minski., 2003). Openness, A and conscientiousness would be expected to be associated with imaginative coping and action, trust and open-mindedness, competence and stress-management (McCrae, 2000); each factor of the Five Factor Model therefore (particularly emotional stability) is potentially associated with aspects of trait emotional intelligence (Austin, Saklofske &

Egan, 2005; Chamorro-Premuzic et al., 2007). In light of this it is not surprising that emotional stability (followed by extraversion) has been the most significant predictor of the big 5 to be associated with subjective wellbeing (Bore, Ashley-Brown, Gallagher & Powis, 2008; Gutierrez, Jimenez, Hernandex & Puente, 2005; Ozer, & Benet-Martinez, 2006; Steel, Schmidt & Shultz, 2008).

Mixed findings in the evidence base could be due to methodological limitations; conceptualisations of emotional intelligence vary and some researchers suggest ability emotional intelligence is the way forward (see chapter 3 for a more in depth discussion); however research pertaining to wellbeing has shown to be better evaluated by trait emotional intelligence (Martins et al., 2010; Schutte et al., 2007; Zeidner, Matthews & Roberts, 2012; Zeidner & Olnick-Shemesh, 2010). Research on emotional intelligence and wellbeing considers a wide range of variables and utilises many different trait measures often focusing on specific dimensions e.g., cognitive or affective (Carmeli at al., 2007; James et al., 2012). Further, research has found that different aspects of emotional intelligence are related to varying aspects of wellbeing; the results of a meta-analysis conducted by Martins, Ramalho and Morin, (2010) however, suggest the Trait Emotional Intelligence Questionnaire is the most robust predictor of a range of wellbeing outcomes, ahead of the EQ-I, Trait Meta Mood Scale, Assessing Emotions Scale etc. This research extends that of Schutte et al., (2007) which found the EQ-I to be most robust predictor; however, this research did not include the newer Trait Emotional Intelligence Questionnaire. The current research aims to assess the association and predictive validity of emotional intelligence by combining a number of well-known clinical outcome measures including cognitive and affective measures to control for spurious effects and by making a distinction between wellbeing and quality of life; emotional intelligence is expected to impact wellbeing and quality of life directly and some mediation effects are expected. This study is the only known research to consider such comprehensive wellbeing variables in a student sample (usually stress and coping) thus making a novel contribution to knowledge. Small sample sizes (e.g., Chamorro-Premuzic, 2007; Extremera, Fernandez-Berrocal., 2005; 2006; Furnham & Christoforou, 2007; James, Bore & Zito, 2012) may have also impacted upon results of previous studies; the current research employs a good sample size (N = 400) and so the results are expected to be more reliable. In light of call from Koydemir and Schutz (2011) this study also employs a wide battery of emotional intelligence measures that consider facets of the Trait Meta Mood Scale in addition to uni-

dimensional models. In addition, as recommended by Martins et al., (2010) this research is concerned with the predictive validity of emotional intelligence beyond the five-factor model of personality. Further, no known study offers the myriad of wellbeing measures that this study does; this is consistent with recommendations from Davis and Humphrey (2012) and will assist in determining whether the effects of emotional intelligence on wellbeing are consistent across a wide spectrum of wellbeing and quality of life outcomes. Mixed findings and methodological limitations inform the need for further research in this area; particularly with underrepresented samples such as students.

In addition to single measures of the cognitive outcome variable satisfaction with life, this has been combined with positive and negative affect to create subjective wellbeing; these three factors are often used as indicators of subjective wellbeing (Diener & Lucas, 1999; Diener, Suh, Lucas & Smith, 1996; Lyubomirsky, King & Diener, 2005). The present research will consider overall subjective wellbeing in addition to positive affect, negative affect and satisfaction with life independently, as recommended by Chamberlain (1988) and because personality traits have shown to have more impact on affect rather than SLW (Jovanovic, 2011; Schimmack, Schupp & Wagner, 2008). It is plausible this may also be the case with emotional intelligence thus emotional intelligence may have more impact on affect. Koydemir and Schutz (2011) found emotional intelligence was predictive of subjective wellbeing beyond personailty and Gallagher and Vella-Broderick (2008) found that emotional intelligence was incrementally predictive of subjective wellbeing and satisfaction with life, negative affect and positive affect beyond social support and Emotional stability but did not include the other personality variables in the regression. This study will assess the incremental validity of emotional intelligence above all the personality variables. In addition emotional intelligence will also be assessed in relation to optimism (Seligman, 2008), health self-efficacy (Dempster & Donnelly, 2008), anxiety, depression and general mental wellbeing (Zeidner et al., 2012).

Wellbeing and academic performance

A secondary aspect of the current research explores the wellbeing/academic achievement relationship. The relationship between mental wellbeing and academic performance is worthy of further investigation, particularly as mental health difficulties have shown to be more prolific in university samples than the general population (e.g., Kitzrow , 2003; Stewart-Brown, Evans, & Patterson et al., 2000; Stallman, 2010). Despite this, there is a

paucity of research into the impact of mental wellbeing on academic performance. The outcomes of such a study may have important implications for health and educational policies. It is intuitive that wellbeing may impact upon academic achievement as high workloads, fears of assessment and balancing educational with personal and social commitments can place a burden on students ultimately affecting their academic performance (Austin, Saklofske & Mastoras, 2010; Roh, Jeon & Kim et al., 2010). Academic stressors and difficulty coping have shown to have a negative impact on grades (Akgun & Ciarrochi, 2003; Austin et al., 2010; Sheilds, 2001; Struthers et al., 2000; Vaez & Laflamme, 2008). However, other wellbeing variables such as positive and negative affect, depression and anxiety and health self-efficacy have been less studied in relation to academic achievement. Positive constructs such as optimism and hope have been given a little more attention; nevertheless, the research is limited. Moreover, the research that does address wellbeing suffers methodological limitations including mixed measures of assessment, non-validated questionnaires, questionable samples and unclear outcomes.

Surtees, Wainwright and Pharoah (2002) found that depression was indicative of achieving lower than a first class degree; however their study included a narrow range of academic outcomes and was conducted in a very high achieving group. Andrews and Wilding (2004) found depression impacted upon the performance of high achieving undergraduates in midcourse exams, whilst anxiety did not and Chambel and Curral (2005) found that neither anxiety nor depression were associated with academic performance. In a sample that was diagnosed with depression, Hysenbegasi, Hass, and Rowland (2005) found depression was associated with lower Grade Point Average and that treatment for depression increased grades, providing a buffer against lower academic performance. According to Hysenbegasi et al., depression has shown to interfere with cognitive processes reflecting a reduction in learning opportunities, a decrease in the level of information able to be absorbed and a decreased ability to demonstrate learning has occurred. A study by Pekrun, Goetz, Titz and Perry (2002) found that anxiety was the most reported emotion experienced by students; however they found it was not the most detrimental attribute to achievement. Anxiety has shown a mixed relationship with academic performance; whilst there are associations between specific test anxiety (see chapter 2), general anxiety has not been well researched; Hojat, Gonnella, Erdmann and Vogel (2003), using validated wellbeing measures and Grade Point Average, found that lower levels of general and test anxiety and depression were associated with better coping which was associated with better grades; however,

Burns (2004) found no relationship between general anxiety and academic performance. Pekrun et al., (2002) also advocate the need to assess positive wellbeing attributes.

Ansari (2010) found general health was partially associated with academic achievement; however the authors do not state whether this is mental or physical health; whilst Chow (2010) found psychological health (reported via a questionnaire that was specifically tailored to the study) to be predictive of academic achievement (assessed via self-reported Grade Point Average) and life satisfaction. This is consistent with Stallman (2010), who using a validated measure, found mental health problems were associated with decreased academic performance. Within the framework of positive psychology, Hope has been associated with better grade point averages, even after controlling for previous grades and other wellbeing variables (Snyder, Shorey & Cheavens et al., 2002; Ciarrochi, Heaven, & Davies 2007). Hope is thought to be particularly relevant to academic performance as it is concerned thinking about goals, having the motivation to move toward goals and with the way to achieve goals (Snyder, 1995); it is considered a dynamic aspect of motivation, rather than an emotionality concept. According to Conti (2000), hopeful students focus on success, therefore attaining their goals seems more likely. Optimism has also been associated with academic performance (Chemers, Hu & Garcia, 2001) but when unique variance is considered above hope, optimism is found to be non-significant (Snyder et al., 2002; Rand, 2009); however Rand attested that shared attributes of hope and optimism as part of an overarching factor of goal attitude, did have a unique influence on academic performance.

Academic variables such as cognitive, emotional, and behavioral engagement and aptitude, and academic performance, have also been associated with higher life satisfaction (Gilman & Huebner, 2006; Rode, Arthaud-Day, & Mooney et al., 2005). According to Rode et al., students with higher life satisfaction show greater resilience in relation to academic challenges, whereas lower satisfaction with life interferes with focus and instigates deterioration in grades.

In light of the aforementioned limitations, the current study aims to address the issues raised by using a cluster of Emotional Intelligence, wellbeing and quality of life measures and objective academic performance outcomes. Further, the evidence base leads to the following hypotheses:

H_1. Emotional intelligence will be most strongly associated with emotional stability and will have smaller but significant correlations with the other Five Factor Model factors.

H_2. Emotional intelligence will be an incrementally valid predictor of wellbeing and quality of life above and beyond personality including emotional stability, which is expected to be the most highly associated personality variable.

H_3. Emotional intelligence will be associated with a spectrum of wellbeing and quality of life indicators, not just a select few.

H_4. Emotional intelligence will be more closely associated with affective variables than cognitive variables.

H_5. Each measure of emotional intelligence will be differentially associated with wellbeing and quality of life; the Trait Emotional Intelligence Questionnaire is expected to be the strongest predictor.

H_6. Not all aspects of wellbeing will be associated with the same academic performance outcomes and some will only be related to specific assessment; therefore, wellbeing will have selective associations with academic performance.

H_7. Positive constructs such as optimism, hope, positive affect and health self-efficacy will be associated with academic performance; hope will add more variance to academic performance than Optimism but both will be associated.

H_8. Negative constructs including anxiety, depression and negative affect will have a negative impact upon academic performance.

Specifically, the aim is to identify the predictive validity of emotional intelligence in relation to wellbeing (affective and cognitive) and quality of life outcomes in a student sample across levels four and five and to assess the impact of wellbeing and quality of life on academic performance.

4.2 Method

Design

This study is a cross sectional, within participants design and a survey method was used and combined with academic performance outcomes. For the first part of the study the predictor variables are the personality and emotional intelligence variables and the outcome variables are the wellbeing and quality of life measures; for the second half of the study the predictor variables are the wellbeing variables and the outcome variable is academic performance. As previous chapters, data analysis includes descriptive and inferential statistics and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled.

Participants

The present sample comprised *N* = 400 participants, the majority were female (f=332; m=68) aged 21–25 years (mean age = 23.68) and most were Caucasion (96%). An opportunity sample of Combined Honours and Applied Psychology undergraduate students took part. The students' personality and emotional intelligence scores were aligned with their wellbeing and quality of life scores.

Measures:

The Five Factor Model and Emotional Intelligence measures are described in previous chapters (see chapters 1 and 3).

Wellbeing measures:

The Adult Hope Scale (Snyder, Harris & Anderson et al., 1991).

The Adult Hope Scale has 12-items including 'There are lots of ways around any problem' and 'I can think of many ways to get the things in life that are most important to me.' The response format is an eight point Likert Scale (1= definitely false to 8= definitely true). Higher scores indicate higher levels of hope and good internal consistency was demonstrated.

Life Orientation Test (LOT) (Scheier & Carver, 1985).

The Life Orientation Test measures levels of optimism and has 12 statement including 6 positive items such as 'In uncertain times, I usually expect the best' and 6 negative items 'I hardly ever expect things to go my way.' Response format is a five point Likert Scale (1(A) = I agree a lot to 5 = I disagree a lot). There are four filler items which are deleted from the coding. Good internal consistency was demonstrated in this study.

The General Health Questionnaire (GHQ12) (Goldberg, 1978).

The General Health Questionnaire-12 focuses on the ability or inability to carry out normal functions and the appearance of new and distressing experiences (Goldberg & Williams, 1988). There are 12 statements that assess how a person has recently been feeling (over the last few weeks) for instance have you recently... 'been able to concentrate on whatever you are doing?' and 'felt you couldn't overcome your difficulties?'. For each statement there are four possible answers, with lower scores reflecting better general and mental health and higher scores representing poorer health. This measure has demonstrated good internal consistency.

The Positive and Negative Affect Scale (PANAS) (Watson, Clark & Tellegen, 1988).

The Positive and Negative Affect Scale has 10 adjectives for positive affect and 10 adjectives for negative affectivity. These adjectives describe feelings and emotions and the participant rates how they feel in general. Adjectives include 'interested', 'alert', 'upset', 'nervous' 'strong' and 'determined'. Response format is a five point Likert Scale (1= very slightly or not at all to 5 = extremely). The scores for the negative affect and positive affect are summed separately to yield one positive affect score and one negative affect score. There is good internal consistency in this study (α = .87; .81) for positive affect and negative affect respectively (α = .78 overall), and research has shown strong divergent validity between positive affect and negative affect (Wilson, Gullone & Moss, 1998) which is mirrored in the present study with a negative correlation between the two r = -.288.

The Hospital Anxiety and Depression Inventory (*HADS)* (Zigmond & Snaith, 1983).

The Hospital Anxiety and Depression Inventory has 14 statements each with 4 possible responses, ranging from positive to negative or negative to positive. There are seven statements relating to depression including 'I have lost interest in my appearance' and 'I

feel cheerful' and there are seven statements relating to anxiety for instance 'I get a sort of frightened feeling like butterflies in the stomach' and 'I get sudden feelings of panic'. Good internal consistency was demonstrated for both anxiety and depression.

Satisfaction with Life Scale (SWL) (Diener, Emmons, Larson & Griffin, 1985).

The Satisfaction with Life Scale has 5 positive statements including 'In most ways my life is close to my ideal' and 'I am satisfied with my life'. The response format is a 7-point Likert scale (1= strongly disagree to 7 = strongly agree). The measure has elicited good internal consistency.

The Health Self-Efficacy Scale (Perceived Health Competency Scale)(Smith, Wallston & Smith, 1995).

The Health Self-Efficacy scale was developed as 'a domain-specific measure of the degree to which an individual feels capable of effectively managing his or her health outcomes' (Smith et al., 1995). There are 8 items in total and scoring is on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). Statements range from 'I handle myself well with respect to my health' to 'I find my efforts to change things I don't like about my health are ineffective.' The measure demonstrated good internal consistency in this study (α =.87).

Subjective Wellbeing

subjective wellbeing was calculated as a composite of satisfaction with life, positive affect and negative affect (Diener, Lucas & Smith, 1999; Lucas, Diener & Suh, 1996).

For academic performance and statistical analyses information see chapters 1 and 2.

4.3 Results

Table 4.1: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Emotional Intelligence (L4 and 5)

	AES	TEIQ	TMMS(T)	ATTENTION	CLARITY	REPAIR	ESES
Mean	123.69	145.48	107.30	46.65	39.40	21.25	117.18
SD	12.63	19.45	13.08	6.48	6.60	4.49	13.83
SK	-.520	-.392	-.327	-.677	-.213	-.489	-.489
Kurtosis	1.471	.084	.391	.846	-.281	-.015	.914
Alpha	.85	.86	.83	.73	.80	.72	.90
Norms/mid points	99	120	90	39	33	18	80

Key: AES = Assessing Emotions Scale TEIQ = Trait Emotional Intelligence Questionnaire TMMS(T) = TMMS Global/Total Score (Subscales of the TMMS = Attention, Clarity and Repair) ESES – Emotional Self-Efficacy Scale

Table 4.2: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Wellbeing (L4 and 5).

	HOPE	SWL	LOT	GHQ	PA	NA	ANXIETY	DEPRESSION	HSE
Mean	46.93	23.32	13.64	12.97	29.59	21.87	8.09	3.64	27.37
SD	7.59	6.13	6.33	6.06	5.80	6.25	3.96	3.31	5.80
SK	-.645	-.413	.306	1.045	-.266	.968	.372	1.359	-.284
Kurtosis	.991	-.425	-.182	1.418	-.111	1.622	-.059	1.639	-.379
Alpha	.84	.84	.85	.86	.63	.68	.78	.78	.85
Norms/midpoints	32	17	12	12	25	25	0-7	0-7	28

Key: Hope = Adult Trait Hope Scale SWL = Satisfaction with Life Scale LOT = Life Orientation Test GHQ = General Health Questionnaire (12 item scale) PA = Positive Affect NA (Negative Affect) (subscales of the PANAS – Positive and Negative Affect Scale) Anxiety and Depression (subcales of the HADS = Hospital Anxiety and Depression Scale) HSE = Health Self-Efficacy Scale
* Descriptive statistics for the FFM are not presented here; please see chapter 1 where these are discussed in depth.

Table 4.1 illustrates the means for Emotional Intelligence; Students have scored above the midpoint of 99 on the Assessing Emotions Scale, demonstrating that the majority of students are moderately emotionally competent by their own estimations; there is however variance around the mean suggesting expected individual differences. This is mirrored for the Trait Emotional Intelligence Questionnaire, Trait Meta Mood Scale and Emotional Self-Efficacy Scale. Further, students have scored moderately high on the Attention, Clarity and Repair subscales of the Trait Meta Mood Scale with adequate spread around the mean.

Table 4.2 illustrates the means for the wellbeing measures; students scored above the midpoint of the Adult Hope Scale (32) and above the Satisfaction with Life scale (17) suggesting they have positive levels of hope and life satisfaction. However, Diener (2006) suggests that scoring between 20 and 24 (this sample scored 23) suggests average of life satisfaction but suggests there are areas for improvement. Participants scored marginally below moderate on the Life Orientation Test and so are considered to be on the low end of moderately optimistic; according to Scheier and Carver (1985) and Scheier, Carver and Bridges (1994) individuals low on optimism score within the range 0 to 13 and those with moderate optimism 14 to 18, the current sample scored just under 14. According to scoring guidelines the General Health Questionnaire scores sit just at the top end of what is considered typical (11-12) indicating average mental health. For Positive Affect students scored above the midpoint (25) suggesting they are moderately high on positive affect and just below the midpoint on Negative Affect suggesting they are low-moderate on negative affect; this is in the expected direction. For the Hospital Anxiety and Depression Inventory students scored within the normal range for depression (0-7) and so are considered not to be depressed; but they scored a little higher on anxiety suggesting mild levels of anxiety (8-10). Finally regarding Health Self-Efficacy students scored marginally below the midpoint (28) suggesting average health self-efficacy. Although all standard deviations are indicative of individual differences (and skewness and kurtosis support good dispersion in responses) there is no tendency toward extremes and mean scores are not generally nested too far from scale midpoints.

As with previous chapters, the quality of the data is demonstrated with low levels of skewness and kurtosis for emotional intelligence (range: -.213 to -.677 and -.015 – 1.471) and for wellbeing (-.266 to 1.102 and -.059 to 1.148, for skewness and kurtosis

respectively). Further, individual differences across the academic performance indicators and self-report measures are suggested by the measures of dispersion (standard deviation) reflecting response deviation from the means. All measures have sound reliabilities (range .72 to.90 and .63 to .86 for emotional intelligence and wellbeing respectively).

Table 4.3: Correlations between Emotional Intelligence and Wellbeing

	Extra	Agree	Consc	ES	Open	AES	TEIQ	TMMS	ATT	CLAR	REP	ESES	HOPE	SWL	LOT	GHQ	PA	NA	ANX	DEP
Agree	.09																			
Consc	-.05	.08																		
ES	.13*	.07	-.00																	
Open	.19**	.05	.10	.10																
AES	.19**	.33**	.21**	.17**	.29**															
TEIQ	.35**	.20**	.29**	.43**	.20**	.63**														
TMMS	.19**	.25**	.20**	.34**	.13*	.53**	.70**													
ATT	.15**	.30**	.12*	.04	.02	.35**	.35**	.80**												
CLAR	.09	.09	.15**	.34**	.14**	.43**	-.60**	.81**	.37**											
REP	.21**	.20**	.19*	.42**	.13*	.43**	.61**	.67	.27**	.37**										
ESES	.17**	.28**	.13*	.24**	.29**	.65**	.58**	.52**	.25**	.49**	.46**									
HOPE	.27**	.12*	.26**	.26**	.33**	.54**	.59**	.38**	.13*	.29**	.48**	.56**								
SWL	.20**	.15**	.17**	.27**	.02	.31**	.50**	.41**	.17**	.29**	.53**	.36**	.48**							
LOT	-.29**	.16**	-.22**	-.46**	-.15**	-.40**	-.67**	-.55**	-.25**	-.38**	-.69**	-.40**	-.52**	-.51**						
GHQ	.13*	.00	-.22**	-.37**	.02	-.18**	-.50**	-.36**	-.05	-.37**	-.44**	-.22**	-.28**	-.45**	-.45**					
PA	.22**	.05	.23**	.15**	.25**	.33**	.39**	.26**	.03	.24**	.36**	.36**	.47**	.36**	-.35**	-.29**				
NA	.03	.05	-.09	.28**	.10	-.08	-.30**	-.30**	-.12*	-.30**	-.26**	-.07	-.04	-.19**	-.25**	.48**	.33**			
ANX	-.13*	.03	-.04	-.48**	-.04	.17**	-.43	-.39**	-.11*	-.42**	-.37**	-.23**	-.16**	-.34**	-.45**	.61**	-.13*	.53**		
DEP	-.22**	.15**	-.18**	-.36**	-.08	-.31**	-.52	-.44**	-.23**	-.34**	-.47**	-.33**	-.32**	-.36**	-.44**	.60**	-.22**	.38**	.55**	
HSE	.01	.04	.27**	-.23**	-.05	.19**	.33	.27**	.07	.26**	.29**	.24**	.19**	.32**	.34**	-.32**	.26**	-.14*	-.32**	
SWB	.21**	.09	.26**	.38**	.08	.38**	.64**	.52**	.18**	.44**	.62**	.42**	.53**	.84**	.59**	-.66**	.52**	-.49**	-.62**	.39**

Key: See tables 1 & 2 for Emotional Intelligence and Wellbeing Keys Extra = Extraversion Agree = Agreeableness Open = Openness Consc = Conscientiousness ES = Emotional Stability

Table 4.3 shows the correlations between personality, emotional intelligence and wellbeing; the inter-correlations between the personality variables are not presented or discussed here as they have been evaluated in depth in chapter 1 (please refer to correlations chapter 1). The majority of personality variables are low to moderately associated with emotional intelligence, though Clarity is not associated with Extraversion or Agreeableness and Attention is not associated with Openness or Emotional Stability. Consistent with H_1 the highest (although still low to moderate) associations between the emotional intelligence and personality variables are for Emotional Stability (*rs* = .166 to .427, *ps* <.01); this is as expected as emotional stability involves numerous factors of emotional intelligence (mood regulation, management etc., see introduction); however the low to modest correlations suggest independence and so they are not expected to measure the same aspects.

The wellbeing measures are low to moderately associated with personality and in the expected direction (range: *rs* = .12 to -.48, *ps* <.05 to <.01). For personality and hope the lowest association is for agreeableness, the highest for openness. All of the personality variables are associated with positive affect with the exception of agreeableness; negative affect is only associated with emotional stability and anxiety is negatively associated with extraversion and emotional stability; it was expected that negative affect and anxiety would be associated with emotional stability as both components involve emotionality and affect. Depression is associated with all the personality variables with the exception of openness; again as expected the highest correlation is with emotional stability in positive and negative directions. Finally, health self-efficacy is associated with conscientiousness and emotional stability. For the Quality of Life variables, satisfaction with life is associated with all except openness; the General Health Questionnaire is associated with all except agreeableness and openness and subjective wellbeing all except extraversion and openness. As expected, the highest associations are between wellbeing and emotional stability (e.g., Austin et al., 2010); this may be due to the wellbeing variables comprising affective components. Further, this indicates that there is validity in exploring emotional variables in relation to wellbeing and the correlations above (emotional intelligence-personality) tentatively suggest that emotional intelligence offers something above and beyond personality, including the emotionality variable, although this needs further testing for incremental validity.

It is clear that Emotional intelligence has the strongest relationship with wellbeing. The Assessing Emotions Scale is associated with all measures of wellbeing in the expected

direction, with the exception of negative affect. This is also the case for the Emotional Self-Efficacy Scale. The Trait Emotional Intelligence Questionnaire is associated with all of the wellbeing variables as is the Trait Meta Mood Scale(total); of the Trait Meta Mood Scale subscales Clarity and Repair are associated with all; whilst Attention is associated with all except the General Health Questionnaire, positive affect and health self-efficacy. These correlations indicate that individuals who are emotionally competent are more likely to be more hopeful, have better satisfaction with life, report less pessimism and more optimism, better mental health, better health self-efficacy and less depression and anxiety.

With regard to the inter-correlations between the emotional intelligence measures all measures are moderately associated. The Trait Meta Mood Scale subscales are also only low to moderately associated; this demonstrates that each measure and each subscale of the Trait Meta Mood Scale taps into different areas of emotional intelligence. The associations between the Trait Meta Mood Scale and its subscales are moderate to high as the total is made up of the subcomponents.

The wellbeing measures are also low to moderately associated indicating each taps into different areas of wellbeing. There is a moderate correlation as would be expected between anxiety and depression and the highest correlations are between wellbeing measures and subjective wellbeing; this is as expected as the subjective wellbeing variable comprises positive affect, negative affect and satisfaction with life (e.g., Lucas, Diener & Suh, 1996) for which the highest correlation occurs; both of these variables are considered quality of life outcomes. Moreover, in the expected direction all of the wellbeing measures are associated with the other quality of life variables, satisfaction with life and General Health Questionnaire. Whilst emotional intelligence and wellbeing elicit the highest correlations, the following analyses will consider the incremental validity of emotional intelligence in subjective wellbeing and its impact on quality of life.

Regression Analyses

Several multiple regressions were conducted using the strongest personality variable (emotional stability) in addition to all the significant emotional intelligence measures on the wellbeing and the quality of life variables. From these regressions emotional stability remained significant on the negative affect variables (negative affect, anxiety and depression) and one positive cognitive factor (Optimism as measured by the LOT), but failed to show significance on Hope, Positive Affect, health self-efficacy of the wellbeing

variables and all of the quality of life variables (satisfaction with life, General Health Questionnaire-12 and subjective wellbeing), seemingly subsumed by the emotional intelligence measures.

From the significant models, hierarchical regression analyses were conducted to assess the incremental validity of emotional intelligence in wellbeing above and beyond Personality. Only maximal hierarchical regression analyses are presented in a table as examples (tables 4.4 and 4.5).

The first (see table 4.4) regressed LOT on emotional stability, followed by the Trait Emotional Intelligence Questionnaire and Repair; model 1 revealed that emotional stability accounted for 21% of the variance in optimism ($f(1,339)=89.775$, $p<.001$; Adj $R^2 = .207$). Model 2 revealed that the emotional intelligence measures accounted for a further 39%; specifically, the Trait Emotional Intelligence Questionnaire offers 29% incremental validity in optimism beyond emotional stability, whilst Repair offers a further 10%. Model 1 as above; model 2: ($f(1,338)=184.126$, $p<.001$; Adj R2 = .485); model 3: ($f(1,337) = 83.067$, $p<.001$; Adj R2 =.586). F-change was statistically significant at each step ($p<.001$).

Table 4.4: LOT regressed on ES, TEIQ and Repair

	B	SE	B	T
ES	-.432	.046	-.458	-9.475***
ES	-.196	.041	-.208	-4.838***
TEIQ	-.189	.014	-.584	-13.569***
ES	-.119	.037	-.126	-3.190**
TEIQ	-.119	.015	-.366	-8.065***
REP	-.569	.062	-.413	-9.114***

F change was significant $p<.001$

The second regressed negative affect on emotional stability, followed by Emotional Self-Efficacy Scale, the Trait Emotional Intelligence Questionnaire, Clarity and Repair; model 1 revealed that emotional stability accounted for 8% of the variance in negative affect ($f(1,339) = 29.279$, $p<.001$; Adj. R2 = .077); model 2 revealed that the emotional intelligence variables added a further 8% ($f(4,335)=8.689$, $p<.001$; Adj. R2 = .154). Specifically Emotional Self-Efficacy Scale lost significance (f-change $p>.05$), whilst the other variables offered marginal incremental validity (f- change $p >.05$ for clarity and Emotional Self-Efficacy Scale; $p<.001$ for all other models).

The third regressed Anxiety on emotional stability, followed by Assessing Emotions Scale, the Trait Emotional Intelligence Questionnaire and Clarity; model 1 revealed emotional stability accounted for 22% of the variance ($f(1,339) = 98.712$, $p<.001$; Adj. $R^2 = .223$); model 2 revealed that the remaining emotional intelligence measures added 10% incremental validity above and beyond emotional stability on anxiety ($f(3,336) = 17.577$, $p<.001$; Adj. $R^2 = .323$); specifically Assessing Emotions Scale loses significance (f-change >.05) but the other emotional intelligence measures maintain significance (f change <.001).

The final (see table 4.5) regressed Depression on emotional stability, followed by the Trait Emotional Intelligence Questionnaire and Clarity; model one revealed that emotional stability accounted for 13% of the variance in Depression ($f(1,339) = 50.886$, $p<.001$; Adj. R2 = .128); model 2 shows that the Trait Emotional Intelligence Questionnaire and Clarity account for a further 18% ($f(1,338) = 79.058$; Adj. R2 = .313). Specifically the Trait Emotional Intelligence Questionnaire offers 16% ($f(1,338) = 79.058$, $p<.001$; Adj. $R^2= .165$) and clarity offers a further 2% ($f(1,338)=11.653$, $p<.001$; Adj. $R^2 = .024$). all f-changes were statistically significant ($p <.001$).

Table 4.5: Depression regressed on ES, TEIQ and Clarity

	B	SE	B	T
ES	-.181	.025	-.361	-7.133***
ES	-.085	.025	-.170	-3.357***
TEIQ	-.077	.009	-.449	-8.891***
ES	-.065	.026	-.130	-2.548**
TEIQ	-.059	.010	-.344	-5.812***
CLAR	-.146	.042	-.199	-3.414***

f change <.001.

To cover all bases, all personality variables were entered into multiple regressions with the wellbeing and quality of life variables. The only personality variables to remain (other than emotional stability as discussed above) were for health self-efficacy, Hope and positive affect. The only remaining factors significant in health self-efficacy were Conscientiousness and Repair, with Conscientiousness accounting for 7% of the variance ($f(1,339) = 27.555$, $p<.001$, Adj. $R^2 = .072$) and Repair accounting for a further 5% ($f(1,338)=22.791$, $p<.001$, Adj. $R^2 = .128$). For Hope the personality variables (excluding emotional stability as it was non-significant) accounted for 21% of the variance in Hope ($f(4,336)=23.702$, , $p<.001$, Adj. $R^2 = .211$) and emotional intelligence variables accounted for a further 29% ($f(6,330) = 33.001$, $p<.001$, Adj. $R^2 = .498$). For positive affect the

personality variables (extraversion, conscientiousness and openness) accounted for 13.5% ($f(3,337)=18.719, p<001$, Adj. $R^2 = .135$); whilst emotional intelligence (Attention, Repair, Emotional Self-Efficacy Scale) accounted for 23% ($f(3,334)=15.568$, $p<.001$, Adj. $R^2 = .234$). All f-changes were statistically significant ($p<.001$).

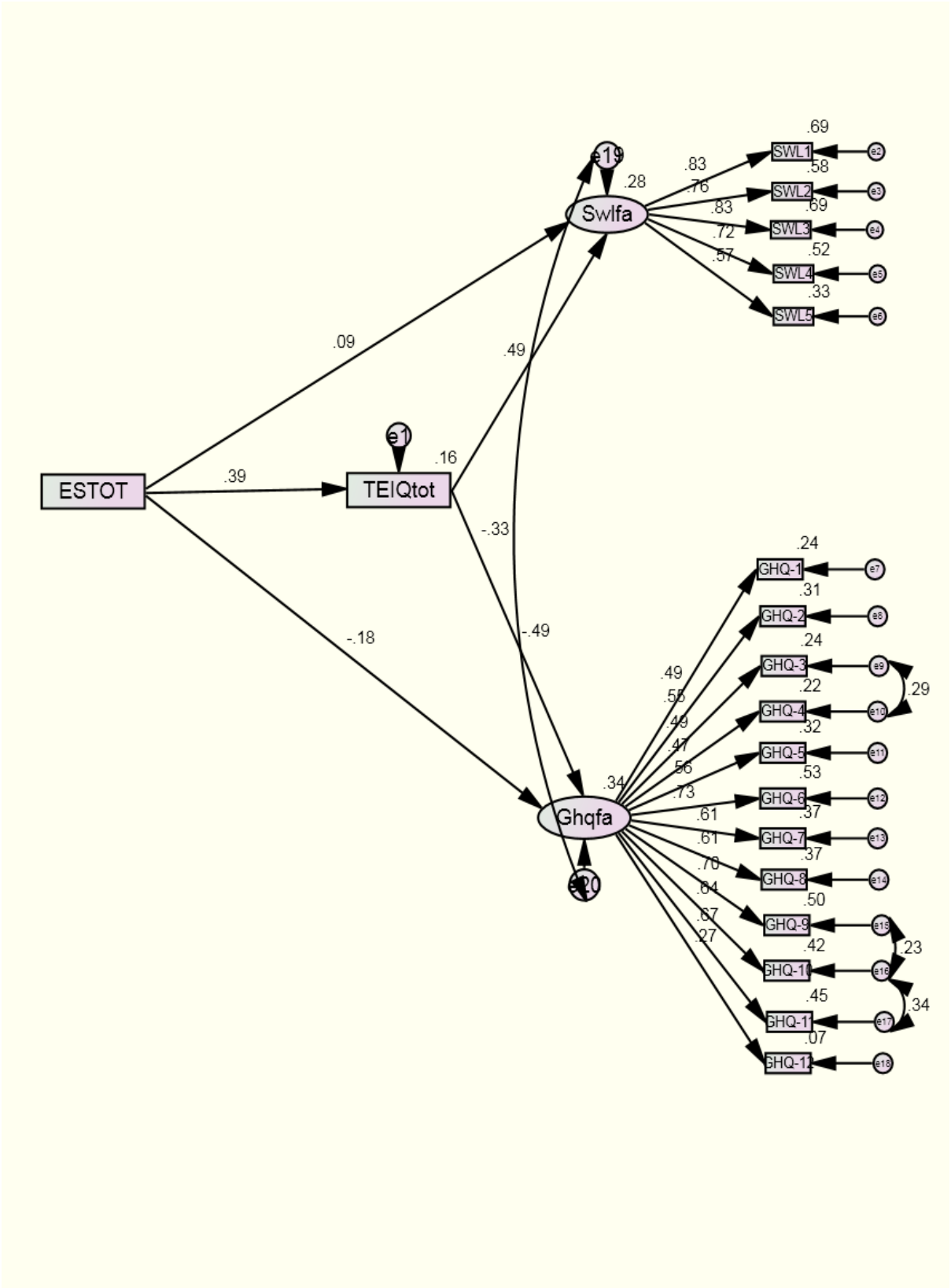
For the quality of life variables in subjective wellbeing the only personality variable that remained significant was conscientiousness. Hierarchical regression analysis revealed that conscientiousness accounted for 6.5% of the variance in subjective wellbeing ($f(1,339) = 10.720$, $p<.001$, Adj. $R2 = .065$); whilst the remaining emotional intelligence variables accounted for an additional 43% of the variance: ($f(3,336)=24.734$, $p<.001$, Adj. $R2 = .494$), specifically the Trait Emotional Intelligence Questionnaire accounted for a further 34%, clarity offered a marginal increase, whilst repair offered a further 8% of the variance in subjective wellbeing.

For satisfaction with life, none of the personality variables maintained significance, indicating that emotional intelligence (Trait Emotional Intelligence Questionnaire and Repair) had a direct impact, subsuming the effects of personality. For the General Health Questionnaire however, hierarchical regression revealed the personality variables (conscientiousness, emotional stability and openness) accounted for 18% of the variance ($f(3,337)=26.175$, $p<.001$, Adj. $R2 = .182$); whilst the remaining emotional intelligence (Assessing Emotions Scale, Trait Emotional Intelligence Questionnaire, Attention, Clarity & Repair) variables accounted for a further 17% ($f(5,332)=18.653$, $p<.001$, Adj. $R2 = .352$; f-changes = $p<.01$).

Consistent with H_2, the results clearly indicate that emotional intelligence offers incremental validity in predicting wellbeing and quality of life beyond that of Personality; often adding more variance.

Based on the results of the regression analyses and informed by the literature the following path models and factor analyses were conducted.

Figure 4.1: Measurement models (satisfaction with life and General Health Questionnaire) presented within a path model related to emotional stability and the Trait Emotional Intelligence Questionnaire.



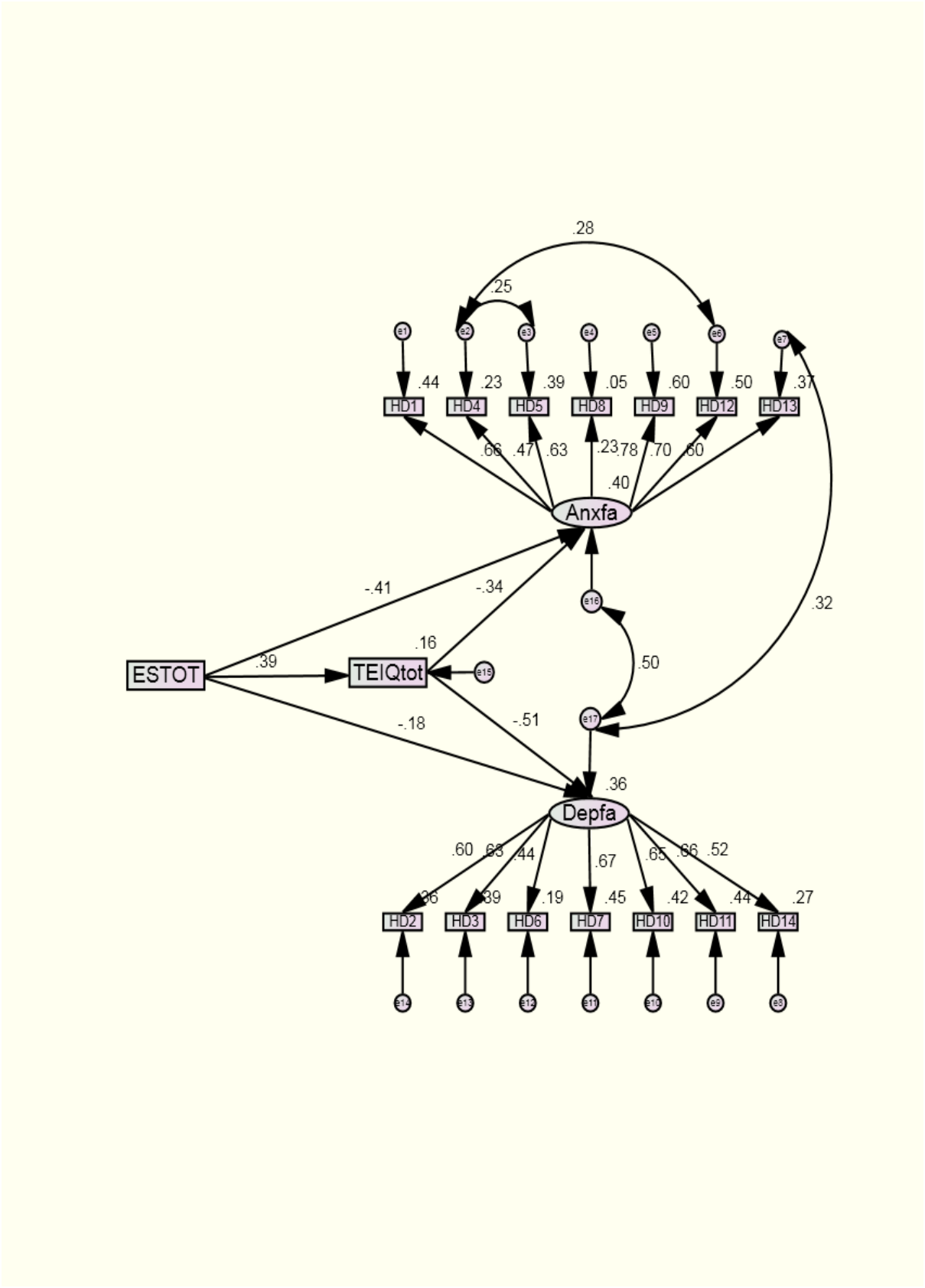
The model presented in figure 4.1 shows the associations between Emotional Stability, the Trait Emotional Intelligence Questionnaire and the two quality of life variables satisfaction with life and General Health Questionnaire. In all there are 5 direct effects and 2 indirect effects. As, indicated by the path coefficient, the direct effect between emotional stability and satisfaction with life is non-significant and is therefore totally mediated by the Trait Emotional Intelligence Questionnaire; the variance explained is 28%. The emotional stability/General Health Questionnaire relationship is partially mediated by the Trait Emotional Intelligence Questionnaire (given that the direct effect remains significant but is reduced from correlation) and the variance accounted for is 34%. The path from emotional stability to the Trait Emotional Intelligence Questionnaire is .39 and emotional stability accounts for 16% of the variance in the Trait Emotional Intelligence Questionnaire, further confirming the indirect effects, particularly adding mediation (Trait Emotional Intelligence Questionnaire) has increased the variance in satisfaction with life and General Health Questionnaire. The strongest pathways are between the Trait Emotional Intelligence Questionnaire and satisfaction with life and between the Trait Emotional Intelligence Questionnaire and General Health Questionnaire (.49 and -.49 respectively); lower scores on the General Health Questionnaire are reflective of wellbeing hence the negative correlation. The outcome variables (quality of life) were factor analysed; all factor loadings were acceptable with the exception of one from the General Health Questionnaire which was low (λ= .27, but the rest were .49 to .73) and no cross-factor loadings were suggested by the modification index; therefore all items loaded on to their appropriate unidimensional factor.

There is an acceptable model fit as shown by the following criteria: RMSEA = .057 (Confidence Intervals = .048 to .066); CFI = .933; TLI = .921; IFI = .934 χ^2 = 302.116, df=145,p<.001 and the SRMR was good at .0502. Bootstrapping revealed that the confidence intervals fell within the indirect effects and that the two indirect effects were statistically significant (-.193 CI = -.264 to -.133, p<.01) for emotional stability, the Trait Emotional Intelligence Questionnaire and General Health Questionnaire (.193, CI = .132 to .259, p<.001) for emotional stability, the Trait Emotional Intelligence Questionnaire and satisfaction with life.

The researcher was unable to present a full structural equation model because the measurement models for emotional stability and the Trait Emotional Intelligence Questionnaire yielded poor indicators of fit. It is clear from the model that the impact of

personality (emotional stability) on the two wellbeing outcomes is enhanced when accompanied by the Trait Emotional Intelligence Questionnaire as its mediator.

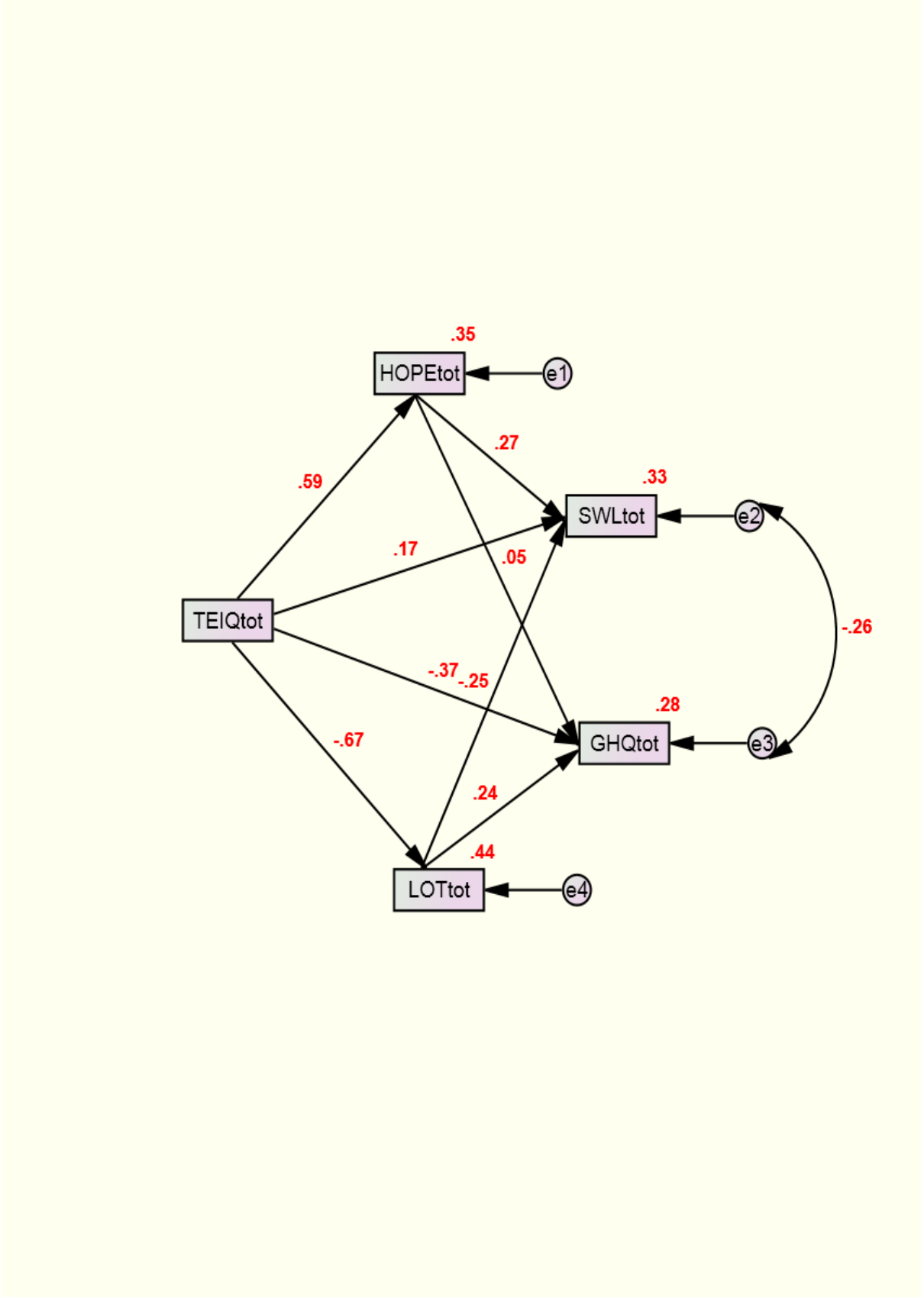
Figure 4.2: Measurement models for anxiety and depression within a path model related to emotional stability and the Trait Emotional Intelligence Questionnaire.



The model presented in figure 4.2 shows the associations between emotional stability, the Trait Emotional Intelligence Questionnaire and negative affect variables (anxiety and depression). In all there are 5 direct effects and 2 indirect effects. The emotional stability/Anxiety and Depression relationship are partially mediated by the Trait Emotional Intelligence Questionnaire and the variance accounted for is 40% and 36% for anxiety and depression respectively. As figure 1, the path from emotional stability to the Trait Emotional Intelligence Questionnaire is .39 and emotional stability accounts for 16%. The strongest pathway is between the Trait Emotional Intelligence Questionnaire and Depression (-.51). The outcome variables (anxiety & depression) were factor analysed; all factor loadings were acceptable (range .47 to .78) with the exception of anxiety item 8 which was low (λ =.23) but this was not typical; no cross-factor loadings were suggested by the modification index; therefore all items loaded on to their appropriate factors. However, a couple of cross-factor residual errors were suggested by the modification indices for improvement of model fit. These were included because they were moderate in strength and empirical studies have recognised that moderate overlap in association between anxiety and depression (e,g, Clark, & Watson, 1991). Another possibility here however, is an order effect because depression and anxiety are presented together within the same measure (Hospital Anxiety and Depression Inventory).

There is an acceptable model fit as shown by the following criteria: RMSEA = .060 (CIs = .049 to .071); CFI = .929; TLI = .913; IFI = .930; χ^2 = 214.840, df=97,p<.001 and the SRMR was good at .0510. Bootstrapping revealed that the confidence intervals fell within the indirect effects from emotional stability through the Trait Emotional Intelligence Questionnaire to Depression (-.200 = -.281 to -.129, p<.01) and (-.134, CI = -.192 to -.082, p<.01) from emotional stability through the Trait Emotional Intelligence Questionnaire to Anxiety.

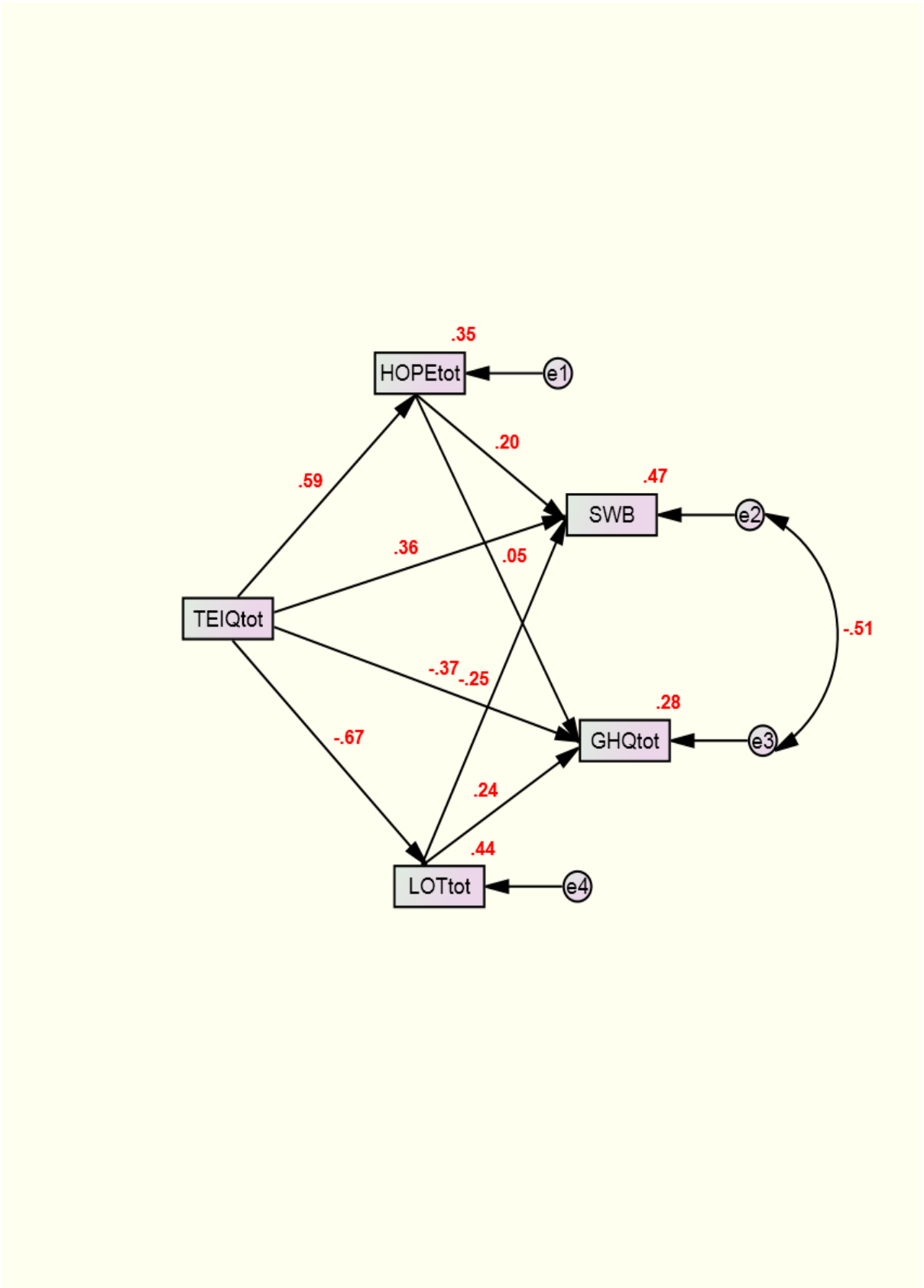
Figure 4.3: SWL and GHQ regressed on the TEIQ, Hope and LOT within a path/mediation model



The model presented in figure 4.3 shows the associations between Emotional Intelligence (Trait Emotional Intelligence Questionnaire), cognitive and positive wellbeing constructs (optimism and hope) and quality of life outcome variables satisfaction with life and General Health Questionnaire. In all there are 8 direct effects and 2 indirect effects. The Trait Emotional Intelligence Questionnaire relationship is partially mediated by hope and optimism and the variance accounted for is 33% and 28% for satisfaction with life and General Health Questionnaire respectively. The strongest paths are between the Trait Emotional Intelligence Questionnaire (emotional intelligence) and optimism (-.67), followed by emotional intelligence to hope (.59) accounting for 44% and 35% respectively. The direct path between the Trait Emotional Intelligence Questionnaire and General Health Questionnaire (-.37) is stronger than the direct pathway via optimism (.24); the direct pathway from Hope to General Health Questionnaire is not significant suggesting that the substantial variance in General Health Questionnaire is attributable to the Trait Emotional Intelligence Questionnaire, by direct and indirect effects. All pathways to satisfaction with life are significant; the strongest is the direct pathway from Hope to satisfaction with life (β =.27).

The model fit is moderately satisfactory although TLI is a little low and the RMSEA a little high but there was no scope for modification: RMSEA = .207 (CIs = .125 to .303); CFI = .977; TLI = .769; IFI = .977; χ^2 = 15.503, df=1, p<.05 and the SRMR was good at .0350; the latter is considered an excellent fit when below .05. Bootstrapping revealed that the indirect effects fell within the 95% confidence intervals and were statistically significant for General Health Questionnaire (-.126; CI = -.249 to -.009, p<.01) and for satisfaction with life (.330; CI = -.192 to .233 to .441, p<.05). Due to the mixture of findings with the fit indices, results must be treated with caution but the very large effect sizes suggest that the variables have been aligned in an efficient manner.

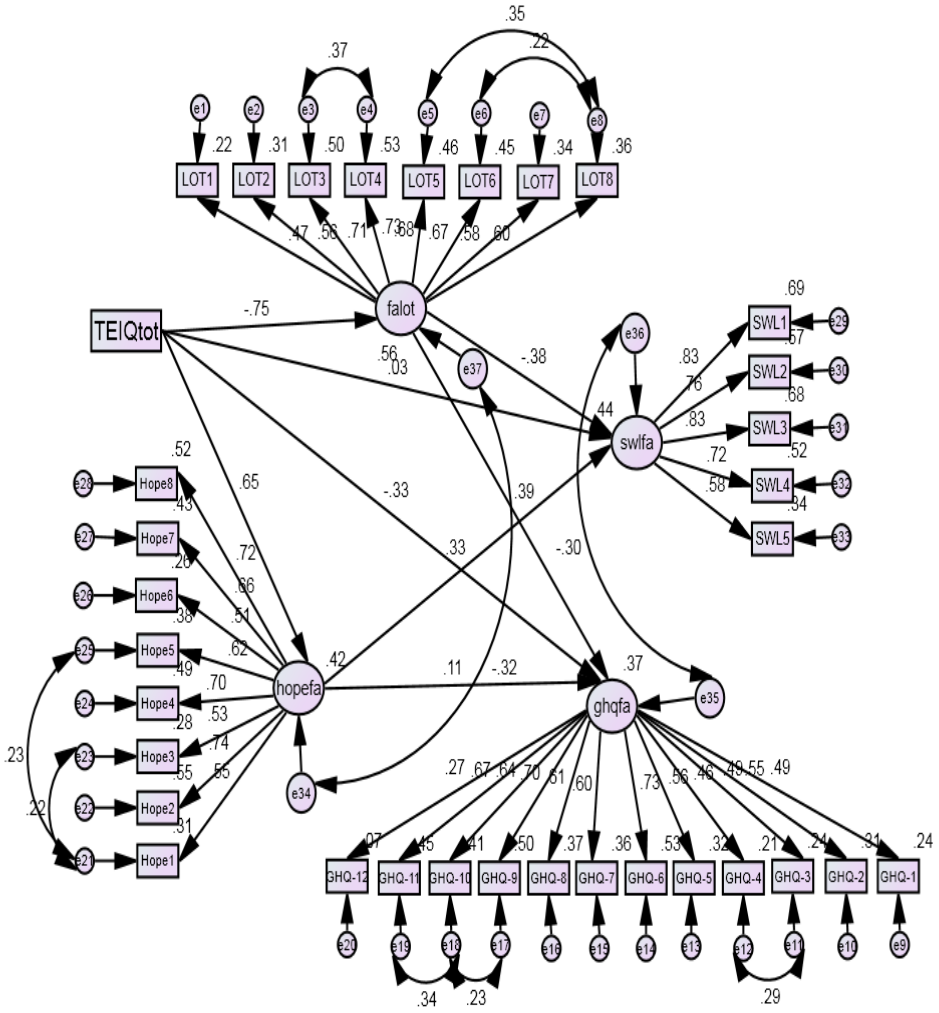
Figure 4.4: SWB and GHQ regressed on TEIQ, Hope and LOT within a path/mediation model



The model presented in figure 4.4 shows the associations between Emotional Intelligence (Trait Emotional Intelligence Questionnaire), cognitive and positive wellbeing constructs (optimism and hope) and quality of life outcome variables subjective wellbeing and General Health Questionnaire. As in the model above there are 8 direct effects and 2 indirect effects. The pathways and variances to the General Health Questionnaire are the same as in the model above. Satisfaction with life has been replaced with subjective wellbeing (which comprises positive affect, negative affect and satisfaction with life); the variance accounted 47% so an additional 14% from satisfaction with life demonstrating there is validity in using subjective wellbeing. The Trait Emotional Intelligence Questionnaire is partially mediated by hope and optimism (i.e., the direct effects are reduced but remain statistically significant) with the indirect paths showing significance (β =.20; β =.25 for hope and optimism respectively) consistent with the model above the direct path from the Trait Emotional Intelligence Questionnaire to subjective wellbeing is stronger β =.36). Bootstrapping showed that the estimate fell within the 95% confidence intervals and that the indirect effects were statistically significant.

The model fit is satisfactory although the RMSEA a little high but as model 4.3, there was no scope for modification, with only 1 degree of freedom left before a saturated model: RMSEA = .207 (CIs = .125 to .303); CFI = .982; TLI = .816; IFI = .982; χ^2 = 15.503, df=1, p<.05 and the SRMR was good at .0350. Bootstrapping revealed that the indirect effects fell within the 95% confidence intervals (.285; CI =.233 to .371, p<.05) for subjective wellbeing.

Figure 4.5: Structural Equation Model for TEIQ, Hope and LOT in relation SWL and GHQ



The final model presented in figure 4.5 (with both measurement and structural components, i.e., a structural equation model) shows the associations between the Trait Emotional Intelligence Questionnaire (the first predictor), the positive wellbeing constructs Hope and Lot (as mediators) and quality of life outcome variables satisfaction with life and General Health Questionnaire. In all there are 8 direct effects and 3 indirect effects. The Trait Emotional Intelligence Questionnaire relationship with satisfaction with life is completely mediated by optimism as the direct effect has become non-significant (β = .03), and the indirect effect is significant (βs = -.75; -.38). However the direct effect between the Trait Emotional Intelligence Questionnaire and General Health Questionnaire (β = -.33) remains significant, but this is a reduction of the correlation and is therefore partially mediated by Hope (βs = .65; .11). As noted, the Trait Emotional Intelligence Questionnaire was completely mediated by optimism but that is also explained by the indirect effect between hope and satisfaction with life (βs = .65; .30). Consistent with this bootstrapping revealed four significant indirect effects between the Trait Emotional Intelligence Questionnaire, optimism and satisfaction with life and the Trait Emotional Intelligence Questionnaire, Hope and Lot (.497; CI = .36 to .65, $p<.01$) and from the Trait Emotional Intelligence Questionnaire through optimism to General Health Questionnaire and the Trait Emotional Intelligence Questionnaire, Hope to General Health Questionnaire (-.226; CI -.41 to -.04, $p<.05$). The variance accounted for is 44% and 37% for satisfaction with life and General Health Questionnaire respectively. All factor loadings were acceptable with the exception of General Health Questionnaire item 8 which was low.

There is an acceptable model fit for the structural model presented as shown by the following criteria: RMSEA = .053 (CIs = .048 to .057); CFI = .901; TLI = .891; IFI = .902; χ^2 = 987, df=501,$p<.001$ and the SRMR was good at .0613.

Wellbeing and Academic Performance Results

Table 4.6: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Wellbeing (L4)

	HOPE	SWL	LOT	GHQ	PA	NA	ANXIETY	DEPRESSION	HSE
Mean	47.71	24.16	13.12	11.78	30.71	21.33	7.79	3.04	28.07
SD	6.90	6.08	6.28	5.78	5.25	5.96	3.92	2.91	5.88
SK	-.499	-.695	.371	1.126	-.382	1.050	.665	1.840	-.476
Kurtosis	.563	-.060	-.326	1.284	-.095	.988	.436	4.124	-.132
Alpha	.81	.85	.84	.86	.67	.74	.80	.77	.84
Norms/midpoints	32	17	12	12	25	25	0-7	0-7	28

Key – see table 4.2

Table 4.7: Means, Standard Deviations, Skewness, Kurtosis and Alpha levels for Wellbeing (L5)

	HOPE	SWL	LOT	GHQ	PA	NA	ANXIETY	DEPRESSION	HSE
Mean	45.63	22.84	14.52	14.64	28.44	22.77	8.44	4.30	26.63
SD	8.23	6.15	6.03	5.70	5.47	5.87	4.10	3.64	5.23
SK	-.621	-.157	.094	.788	-.081	.994	.134	1.020	.000
Kurtosis	1.181	-.581	.141	1.360	.317	.638	-.291	.493	-.150
Alpha	.88	.87	.84	.83	.67	.73	.77	.79	.86
Norms/midpoints	32	17	12	12	25	25	0-7	0-7	28

Key – see tables 4.2

Tables 4.6 and 4.7 illustrate the means for the wellbeing measures for levels 4 and 5; the level 4 cohort scored above the midpoint of the Adult Hope Scale, suggesting normal to positive levels of hope; the level 5 cohort scored above the midpoint suggesting the same but their scores were lower than the level 4 cohort. Both cohorts scored in the range of 21-25 for satisfaction with life indicating they are slightly satisfied and as such considered to have average life satisfaction (Diener, 2006). Participants scored on the low end of moderately on the Life Orientation Test (14-18) and so are deemed generally optimistic with some pessimistic traits (e.g., Scheier & Carver, 1985). For the level 4 cohort General Health Questionnaire scores sit within the typical range indicating average mental health; however the level 5 cohort are at the low end of what is considered typical and marginally below that considered to suggest evidence of distress. For Positive Affect, students scored above the midpoint suggesting they are moderately high on positive affect and below the midpoint on Negative Affect suggesting they have low-moderate negative affect, slightly higher for the level 5 cohort; this is in the expected direction. For the Hospital Anxiety and Depression Inventory, students scored within the normal range (0-7) for depression and so are considered not to be depressed; but they scored a little higher on anxiety suggesting slightly increased levels of anxiety, this is particularly so for the level 5 cohort as scoring in the range 8 – 10 is considered indicative of mild anxiety. Finally regarding Health Self-Efficacy, the level 4 cohort scored just above the midpoint of 20 indicating they are marginally oriented toward being self-efficacious about their health, whilst the level 5 cohort scored just below indicating they have slightly lower health self efficacy beliefs. All standard deviations are similar across cohorts indicating, whilst there are individual differences, the majority of students have average wellbeing; however level 5 have lower levels of wellbeing than level 4 as indicated across a number of measures.

As with previous chapters, the quality of the data is demonstrated with low levels of skewness and kurtosis for Level 4 (range: .371 to 1.126 and -.060 – 1.284) and level 5 (.000 to .788 and .141 to 1.360 for skewness and kurtosis respectively). The large kurtosis for depression at level 4 (4.124) is impacted by a single outlier, although depression scores are not expected to be within the normal distribution. All measures have sound reliabilities (range .67 to.86 and .67 to .88 for level 4 and 5 respectively).

Bivariate Analyses

Correlations between wellbeing, quality of life and academic performance for the level 4 cohort (see table 4.8, appendix 5.1) reveal Research methods I and Research Methods II are associated with negative affect as are Social psychology and Individual Differences modules, Abnormal PSychology and level 5 average marks (*rs* = .17 to .20, p< .05). Social Psychology and Individual Differences is also associated with positive affect (r = .17, p<.05) and Developmental and Social Psychology with Hope (r = .17, p< .01). There are no other associations between wellbeing and academic performance for this cohort.

Correlations between wellbeing and academic performance for the level 5 cohort (see table 4.9 appendix 5.2) reveal that for level 4 grades the only associations to emerge are between Research Methods I, hope and positive affect (rs =. 17 and .14, ps<.05 respectively) and between level 4 average and optimism (LOT) (r = -.170, p<.05),. Table 4.10 (appendix 5.3) illustrates the correlations between level 5 marks and wellbeing; these include individual assessment marks and are as follows: Research methods II exam is associated with hope and optimism (LOT) (*rs* = .15; .17, ps<.05); Research Methods overall module mark with health self-efficacy (r = .14, p<.05); Biological, Cognitive and Developmental Psychology coursework with negative affect (r = .15, p<.05); Social Psychology and Individual Differences coursework with negative affect and anxiety (*rs* = -.17; -.18, ps<.05); Psychology in Application II module mark with depression and negative affect (rs = .14; .14, ps<.05) and finally between level 5 average mark and health self-efficacy, depression and negative affect (rs = .14; -.15; -.14). Consistent with H_8 this illustrates the benefit of including individual assessment marks as some correlations are missed through module or average marks. As with the previous cohort (level 4) negative affect appears to be the most salient factor associated with academic performance.

Table 4.11 (appendix 5.4) demonstrates the correlations between level 6 grades and wellbeing, the correlations that have emerged are between Forensic Psychology and optimism (LOT) (r = -.14) and encouragingly between the dissertation module and satisfaction with life, negative affect, and anxiety (*rs* = .15; -.22; -.14 respectively, ps<.01 to <.05). There are also associations between level 6 average, overall grade point average and health self-efficacy (*rs* = .14; .15 respectively, ps<.01).

Regression Analyses

Multiple and hierarchical regression analyses were conducted for the level 5 cohort; Level 4 Average on optimism (LOT) and hope; combined hope and optimism accounted for 2.3% of the variance in level 4 average ($f(2, 210) = 3.508$, $p < .05$; Adj $R^2 = .023$). When entered into a hierarchical regression, hope accounted for marginally more variance than optimism (which was subsumed when hope was added) 1.5% for hope versus .5% for optimism which became non-significant.

Research Methods exam was also entered into a regression with hope and optimism, and as with level 4 average, together accounted for 2.3% of the variance. Hierarchical regression revealed that only hope was significant and accounted for 1.6% of the variance in Research Methods exam ($f(1,211)=4.509$, $p<.05$, Adj $R2=.016$; whereas optimism accounted for 0.7% but was not significant.

For level 5 average, multiple regression revealed that health self-effiacy, depression and anxiety accounted for 1.6% of the variance combined; whereas hierarchical regression revealed health self-efficacy was the only significant predictor when depression and anxiety were added to the model ($f(1,211)=4.305$, $p<.05$ Adj $R^2 = .015$), thus accounting for 1.5% of the variance in level 5 average mark.

Finally, Dissertation grade was regressed on satisfaction with life, negative affect and anxiety; multiple regression showed the variance was coming from negative affect, as this was the only significant factor. The combined model accounted for 5% of the variance ($f(3,209)=4.627$, $p<.01$. Adj $R^2=.049$). When entered into a hierarchical regression however both satisfaction with life and negative afffect were independently significant, with satisfaction with life accounting for 2% of the variance ($f(1,211)=5.061$, $p<.05$; Adj $R^2 = .019$ and negative affect accounting for 5% of the variance in dissertation mark ($f(1,210) = 8.567$, $p<.01$, Adj $R^2 = .053$; however when negative affect and anxiety were entered into the model satisfaction with life was subsumed.

4.4 Discussion

Emotional intelligence theory proposes that meta-cognitive perception of emotion allows enhanced understanding, management, regulation and adaptive coping skills, which in turn affect wellbeing (Austin, Saklofske & Mastoras, 2010; Bond & Donaldso-feilder, 2004; Downey, Johnston & Hansen et al., 2010; Petrides, Pérez-González & Furnham, 2007; Petrides, Pita et al., 2007). The main theme of this study was to assess the impact of Emotional Intelligence on wellbeing and quality of life.

Consistent with hypothesis 1, emotional stability was the most valid predictor of the personality variables in emotional intelligence, wellbeing and quality of life (as indicated in tables 4.3 & 4.4 for example); this corroborates previous research (Austin et al., 2005; Dawda & Hart, 2000; James, Bore & Zito, 2012; Petrides & Furnham, 2001; Saklofski, Austin & Minski, 2003). Moreover, as H_2 stipulated, emotional intelligence was a valid predictor of wellbeing and quality of life above and beyond all the personality variables including emotional stability (e.g., as presented in tables 4.4 and 4.5). Further, as can be seen in table 4.3, emotional intelligence was associated with all wellbeing and quality of life variables (H_3). As demonstrated in figures 4.1 to 4.5 the path models presented in the results enrich the findings in relation to the basic hypotheses and show that emotional intelligence partially mediated the relationship between emotional stability and the affective and cognitive wellbeing variables and emotional intelligence was partially mediated by the cognitive wellbeing variables in relation to quality of life, particularly satisfaction with life. Whilst H_4 is only partially supported, H_5 is fully supported.

In contrast to Extremera and Fernandez-Berrocal (2005) the current study found repair rather than clarity to be associated with satisfaction with life; this still shows support for the Trait Meta Mood Scale in assessing the relationship between emotional intelligence and satisfaction with life; further the Trait Emotional Intelligence Questionnaire was also a significant predictor of satisfaction with life whilst all the personality variables were subsumed. This provides further support for emotional intelligence being independently associated with life satisfaction; Clarity was also incrementally associated with negative affect, anxiety and depression (Salovey et al., 2002) and subjective wellbeing; and repair with positive quality of life outcomes subjective wellbeing, satisfaction with life and General Health Questionnaire. The most robust emotional intelligence variable in relation to all wellbeing and quality of life outcomes however was the Trait Emotional Intelligence

Questionnaire (H_5). Further, adding to previous research that shows incremental validity (e.g., Extremera et al., 2005; Chamorro-Premuzic et al., 2007; Davis & Humphrey, 2012; Furnham & Christoforou, 2007; Sanchez-Ruiz et al., 2013); this research shows that emotional intelligence has even stronger predictive validity than personality (including emotional stability) in numerous outcomes and suggests people who are able to repair their mood and have interpersonal and intrapersonal emotional intelligence, have better life satisfaction. Whilst Extremera and Berrocal (2006) found too much attention to feelings was associated with higher levels of anxiety and depression and clarity and repair associated with lower levels of anxiety and depression, this study found that attention and repair, whilst associated, were partialled out in the regression analyses leaving clarity and the Trait Emotional Intelligence Questionnaire as robust predictors of anxiety and depression; whilst the Trait Emotional Intelligence Questionnaire, clarity and repair were associated with negative affect.

In contrast to James, Bore and Zito (2010) this study found emotional intelligence was a significant predictor of depression beyond emotional stability, accounting for an even higher percentage of variance; further emotional stability was no longer a significant predictor of satisfaction with life when emotional intelligence was added. In accordance with recommendations by Zeidner et al., (2012) this research looked independently into the effects of emotional intelligence on affective dispositions and cognitive states (e.g., hope and optimism); whilst the associations were similar in size and significance across the affective and cognitive wellbeing measures, emotional intelligence accounted for more variance in the cognitive factors than the affective (H_4); this is in contrast to Koydemi and Schutz (2011), who found stronger associations for the affective components. However, Koydemir and Schutz (2011) only used one cognitive measure (satisfaction with life); this study confirms that emotional intelligence is predictive of satisfaction with life but it is mediated by Hope when entered into a structural model and emotional intelligence does have marginally more association with Depression than satisfaction with life (H_4). This supports the notion that only using one cognitive measure of quality of life can limit the findings and create a biased outcome. In support of Koydemir and Schutz's (2011) findings however, though to a larger extent, emotional intelligence did predict incremental variance in subjective wellbeing; indeed with regard to the outcome measures emotional intelligence accounted for the most variance in subjective wellbeing, presumably as this factor comprises, positive affect, negative affect and satisfaction with life; emotional

intelligence accounts for significantly more variance when these factors are combined to form one, though this research shows there is validity in measuring both.

It is logical that individuals with more clarity and who are better able to repair their moods are likely to have enhanced wellbeing (Furnham & Christoforou, 2007) and this study provides evidence that individuals with the ability to perceive, manage and repair their emotions are more competent in coping and so experience lower levels of distress. However, the current study has also demonstrated emotional intelligence is predictive of the cognitive variables; this is consistent with results of a review by Zeidner, Matthews and Roberts (2012) who found emotional intelligence was positively associated with the cognitive aspects of wellbeing and negatively with affective disorders. The results add to the growing body of research in confirming the distinctness of emotional intelligence from Personality. Further, it suggests that emotional intelligence is more significant than personality on a number of life outcomes.

There are clear benefits to using a multi-measure emotional intelligence approach as the measures vary in their assessment. The most important emotional intelligence variables for negative affect were the Trait Emotional Intelligence Questionnaire, Clarity and Repair, for positive affect the personality variables (extraversion, conscientiousness and openness) accounted for 13.5% of the variance, whilst emotional intelligence (Attention, Repair, Emotional Self-Efficacy Scale) accounted for 23%. For anxiety and for depression, the Trait Emotional Intelligence Questionnaire and Clarity were the most influential emotional intelligence measures, particularly the Trait Emotional Intelligence Questionnaire. For the cognitive variables the Trait Emotional Intelligence Questionnaire and Repair were predictive of optimism (LOT); Repair (conscientiousness was also an important variable) for health self-efficacy and for Hope the personality variables (excluding emotional stability as non-significant) accounted for 21% of the variance and the emotional intelligence variables a further 29%. Regarding the quality of life outcomes, none of the personality variables maintained significance in satisfaction with life indicating that emotional intelligence (Trait Emotional Intelligence Questionnaire and Repair) had a direct impact, completely subsuming the effects of personality. In the assessment of mental health (General Health Questionnaire) the personality variables (conscientiousness, emotional stability and openness) accounted for 18% of the variance, whilst the remaining emotional intelligence (Assessing Emotions Scale, Trait Emotional Intelligence Questionnaire, Attention, Clarity & Repair) variables accounted for a further 17% (see

regression analyses for emotional intelligence and wellbeing pp. 139 to 140. The results are in accordance with other studies reporting emotional intelligence offers incremental validity in wellbeing and quality of life (Chamorro-Premuzic et al., 2007; Davis & Humphrey, 2012; Furnham & Christoforou, 2007; Gardner & Qualter, 2010; Palmer, Donaldson & Stough; 2002; Sanchez-Ruiz, Mavroveli & Poulis, 2013; Schutte and Malouff; 2011). However, in contrast to the small to modest incremental validity reported in other studies, emotional intelligence shows more predictive validity than these studies found in each outcome variable assessed.

Consistent with the findings from a meta-analysis conducted by Martins, Ramalho and Morin, (2010) the current research highlights that the Trait Emotional Intelligence Questionnaire is the most robust predictor of wellbeing and quality of life, whilst Trait Meta Mood Scale clarity and Repair subscales come a close second. Whilst Emotional Self-Efficacy Scale was associated with all wellbeing and quality of life variables, it had the least predictive validity of all the emotional intelligence measures (it offered small incremental validity in positive affect), followed by the Assessing Emotions Scale and the attention subscale of the Trait Meta Mood Scale which were only independently associated with General Health Questionnaire. The main association from the personality variables was emotional stability; this is not surprising as this trait is associated with better mood regulation and management (Austin, et al., 2010; Saklofske et al., 2003). Further, high emotional intelligence individuals may be able to maintain positive states and regulate their mood by countering negative influences and maximising positive states (Schutte et al., 2002).

Wellbeing and academic performance

Consistent with previous research the findings suggest partial association with academic performance. This is the first study known to the researcher to employ such comprehensive wellbeing and quality of life measures in association with objective grades including module averages, yearly averages, overall Grade Point Average and a selection of specific module outcomes (coursework and exams). The findings are mixed with some wellbeing attributes being associated with certain outcomes but not others (H_6). At level 4 the positive constructs of Hope, positive affect and Optimism were indicative of better academic performance (Research Methods and Level 4 Average); this reflects research by Snyder et al., (2002) who found Hope was associated with better grade point averages. At

level 5 Hope and Optimism were again employed in relation to Research Methods (exam); this suggests that having high levels of optimism and hope are useful for statistics which is considered one of the most challenging modules (Onwuegbuzie & Wilson, 2003; Onwuegbuzie et al., 2010). Optimism is associated with positive future expectancies, higher levels of engagement, coping and more persistence in educational efforts, therefore it is no surprise it is associated with better academic performance. Further Hoy, Tarter and Hoy (2006) found that Optimism related to better grades in secondary school children; however, consistent with Snyder et al., (2002) when entered into a regression, hope accounted for significantly more variance and in one model the effects of optimism were subsumed (H_7). Hope is distinct from optimism in that the hope model focuses on the thoughts an individual has about what they can do to achieve their goals, whilst optimism relates to general expectancies for the future but does not determine the individual has any control over this, as with hope (Carver & Scheier, 2002); however, there may be some overlap which could explain why optimism is subsumed.

In the expected direction health self-efficacy, negative affect, anxiety and depression were associated with select level 5 modules and level 5 average ($H_{6, 7, 8}$); the finding that such associations exist in relation to specific outcomes is important as it demonstrates these associations can be missed by only considering Grade Point Average. Further, level 5 scored marginally low on these wellbeing attributes, suggesting that health self-efficacy, negative affect and anxiety in particular are relevant to academic success. For level 6, optimism, negative affect, anxiety and satisfaction with life were associated with module averages; health self-efficacy was associated with level 6 averages mark and overall award. These findings are consistent with some previous research (e.g., Andrews & Wilding, 2004; Chemers et al., 2001, Gilman & Hueber, 2006; Goetz et al., 2002; Hysenbegasi et al., 2005; Rode et al., 2005). Whilst the relationship between wellbeing and academic performance is limited it does perhaps indicate that various aspects of wellbeing impact upon various aspects of education; this could relate to course requirements, anxiety levels or positive thoughts about specific modules. Further, as the current study employs a multi-measure approach to wellbeing and is more comprehensive in its academic performance measurement than previous studies, this increases the possibility that the results are a more accurate reflection of the wellbeing/academic performance relationship.

The means from the current research demonstrate that whilst average mental health is indicated, students in level 5 have slightly low levels of hope and optimism and slightly

elevated levels of anxiety and negative affect, which could imply that students are an at risk group for mental health problems and decreased academic performance; this is consistent with research by Stallman (2010) who found students to be high risk group. Further, within the current study, level 5 appear more at risk than level 4, which could be indicative of increased workload and pressure, given their performance counts toward their final grade. Recent research at LJMU has focused on the 'Sophomore Slump', and although this is sometimes explained by apathy (Zaitseva, Milsom, & Stewart, 2013), these findings suggest that pressure and workload may also be implemented. Students in the current study do however have higher levels of health self-efficacy which may provide a buffer against mental health difficulties developing and decreased academic performance.

Goetz et al's., (2002) findings that students experienced positive emotions including hope as much as negative affect including anxiety and that these impacted upon academic performance reflects the current research and suggests that numerous aspects of wellbeing including negative and positive attributes might impact upon student grades (Rode et al., 2009). These findings also indicate attempts should be made to decrease negative and increase positive wellbeing. The current research informs the need to ensure students have access to counselling, intervention programmes or health awareness in order to protect them from developing mental health problems and to ensure their academic performance does not decrease. Specifically, this study reveals anxiety and depression are associated with some aspects of academic performance, in particular negative affect shows unique variance. Further, the positive constructs of hope, optimism and health self-efficacy are associated with academic performance and consequently may provide a buffering effect.

Strengths of the current study

This study measured wellbeing in relation to affect (negative affect, positive affect, anxiety and depression), cognitive wellbeing variables (hope, optimism, health self-efficacy) and quality of life outcomes General Health Questionnaire, satisfaction with life, and subjective wellbeing (which combines affect and satisfaction with life). It also measured the impact of wellbeing on academic performance. The research confirms that emotional intelligence is incrementally predictive, above and beyond personality in all of the wellbeing and quality of life outcomes. The current sample size was larger than most previous research in this area (e.g., Chamorro-Premuzic, 2007; Extremera, Fernandez-Berrocal., 2005; 2006; Furnham & Christoforou, 2007; James, Bore & Zito, 2012).

Employing a cluster of measures for both emotional intelligence, wellbeing and quality of life in addition to multi-academic achievement outcomes, overcomes limitations of including only one wellbeing or outcome variable such as satisfaction with life or subjective wellbeing or in relation to academic performance. The current study also explored relationships through path analyses, factor analyses and structural equation modelling adding more validity to the results.

Limitations and future directions

It is possible that shared method variance may have inflated the relationships between measures and this is difficult to assess without the use of an objective measure; however, given that objective measures have been found to be measuring cognitive abilities rather than subjective perceptions, self-report seems more suitable to the perception of wellbeing. Further, within the framework of cognitive psychology, how a situation is appraised varies between individuals and has no meaning outside of a person's mind (Cooper, 1998; Hojat et al., 2003); therefore, it is not the event itself but the individual's appraisal of that event that determines whether they experience maladaptive responses (Beck, Rush, Shaw & Emery, 1979); self-report may capture the inner workings of a person's mind as they see it. Steps were taken to reduce socially desirable answers, such as asking the respondents not to think too much about their answer and according to Choi, Kluemper and Sauley, (2011) emotional intelligence/wellbeing associations demonstrate robustness against socially desirable responding. Moreover, using multi-surveys assists in establishing respondent agreement across measures however, despite recommendations that multi-informant reports could be used to enhance self-report measures (Schneider & Schimmack, 2009; 2010), wellbeing and quality of life is perceptual in nature and can only be fully expressed by the individual perceiving them. Whilst causality cannot be inferred in cross-sectional studies, regression allows for clarification and assessment of incremental and predictive validity (Austin et al., 2005) and the evidence indicates that emotional intelligence may provide protection against poor mental health and poor life quality. This identifies the need for emotional intelligence interventions in relation to improving wellbeing of students.

Future research could extend this study by assessing how emotional intelligence interventions might improve student wellbeing. Future research might consider investigating the efficacy of interventions aimed at increasing emotional intelligence and so improving the mental health of university students (Meyer, Fletcher & Parker, 2004).

Further, given the strong associations, research could consider emotional intelligence in relation to clinical disorders and management. The current research measured a predominantly healthy sample (students) but future research might consider individuals with poor health and the possible associations with emotional intelligence and wellbeing (Zeidner et al., 2012). Although this is beyond the remit of this thesis; future research employing samples with clinical anxiety, depression or mood disorders may prove useful. It is envisaged that emotional intelligence would improve perception of wellbeing and thus quality of life. Although not clinically relevant, it is possible however that the current students may suffer varying degrees of anxiety (as indicated by the cohort means). Further, students were on the low end of health self-efficacy and optimism and whilst their life satisfaction scores indicated they were generally satisfied, the scores also indicated there are areas that could be improved (Diener, 2006). This may be because of the demands of tertiary education placing unequivocal stressors upon them (Austin et al., 2010; Salami, 2006).

Further, future research might consider investigating whether the new financial burden on students is associated with lower levels of wellbeing and whether this ultimately impacts upon grades. Andrews and Wilding (2004) found that financial stressors lead to depression which then had an impact upon midterm exams, highlighting this may be an important risk factor for students. Anarsi (2010) found wellbeing was partially associated with academic achievement and provided a conceptual framework suggesting the wellbeing/academic achievement relationship is reciprocal in nature; this study affirms these results also finding wellbeing has a selective impact upon academic performance and a reciprocal framework is suggested for instance it is asserted that wellbeing has an impact on academic achievement and in turn successful academic achievement impacts wellbeing. Longitudinal studies between wellbeing and academic performance are necessary to confirm this interpretation.

Summary

Overall, Individuals who are aware of their feelings, who are more skilled in clarifying their thoughts, repairing and maintaining their mood, who are able to recognise the moods and needs of others, and have more adaptive coping methods are more likely to have higher emotional intelligence and so be better able to maintain wellbeing (Austin et al., 2005; Extremera & Fernandez-Berrocal, 2006; Fernandez-Berrocal & Extremera, 2005;

Gallagher & Vella-Broderick, 2008; Saklofski et al., 2007). Further, as Extremera and Fernandez-Berrocal (2005) state, it appears emotional intelligence is a robust predictor of real life outcomes, thus an important measure of individual differences including wellbeing and quality of life. To this end, the current study reflects the literature suggesting that emotional intelligence is a strong predictor of mental wellbeing including lower levels of depression and higher satisfaction with life (Austin, Parker, Petrides & Saklofske, 2008; Johnson et al., 2009; Platsidou, 2010); two major meta-analyses in this area corroborate this (Martins et al., 2010; Schutte, Malouff & Thorsteinsson et al., 2007). The current research adds to previous literature in establishing the usefulness and predictive validity of emotional intelligence in wellbeing and quality of life for students in tertiary education by using more advanced methods of analysis, more predictor and outcome variables in order to comprehensively address some of the gaps in the emotional intelligence/wellbeing literature. Further, links with academic performance have been established and the current study offers more robust and consequently reliable findings than previous research. Whilst the impact may be selective, the association is clear and highlights the need for further research on the wellbeing/academic performance relationship.

Whilst wellbeing has been comprehensively covered here, sleep has been established as essential to wellbeing and quality of life (Gaultney 2010; Lund, Reider, Whiting & Prichard, 2010). Given the importance of sleep in relation to wellbeing and its potential for impacting upon academic performance (Curcio, Ferrara & Gennaro, 2006; Dewald, Meijer, Oort, Kerkhof & Bogels, 2010; Galambos, Howard & Maggs, 2010) it will be discussed within the following chapter.

The current chapter adds substantially to knowledge by a more comprehensive approach than previous studies relating both to predictors and outcomes (conceptually as the study is cross-sectional) as seen in the following summary overview points:

1. The inclusion of a range of personality-related variables (emotional intelligence and Five Factor Model) in order to identify the most robust predictors across a full range of wellbeing outcomes - emotional stability and the Trait Emotional Intelligence Questionnaire have emerged as salient and pivotal with very substantial effect sizes.

2. The inclusion of cognitive wellbeing measures (Hope, Optimism and Health Self-efficacy) to ascertain their direct and indirect effects on wellbeing outcomes. Hope and Optimism have emerged as potent mediators of emotional stability and the Trait Emotional

Intelligence Questionnaire, and along with health self-efficacy may serve as a buffer against distress for students.

3. A good range of wellbeing outcome indicators (General Health Questionnaire, satisfaction with life, subjective wellbeing) have pinpointed aspects of wellbeing that are predicted differentially by the range of validated predictors within the models tested and therefore allow precision in tracing particular effects, with very large effect sizes, for example 47%, 33% and 28% on subjective wellbeing, satisfaction with life and General Health Questionnaire respectively.

4. Affect measures (Anxiety and Depression) have elicited substantial variance (40% and 36%) in relation to emotional stability and the Trait Emotional Intelligence Questionnaire in a mediation model and the outcomes suggest that these may act as buffers for student welfare (with implications for growing student debt problems and Sophomore Slump).

5. Some links have been established between wellbeing and academic performance and although these are not strong or consistent they do suggest potential for future investigation including the possibility that good performance and wellbeing may impact mutually on each other in a feedback loop.

Chapter 5

Immediate and long-term adjustment to student sleep patterns in response to academic demands: individual difference and wellbeing factors

Abstract

A repeated measures (quasi) experimental design enhanced by self-report measures was conducted with N = 32 participants. The experimental variables and the self-report measures were aligned with concurrent academic performance indicators. Research indicates that poor sleep is indicative of decrements in academic performance and poorer wellbeing (e.g., Eliasson, Lettieri, & Eliasson, 2010; Gaultney, 2010). Research has also shown that before an exam students may engage in a cramming exercise, whereby they are awake for all or part of the night; implications of a night without sleep could be serious, affecting sleep-wake cycles and ultimately mood, wellbeing and academic performance (Thacher, 2008).The current findings support the argument for the importance of good sleep quantity but particularly good sleep quality in relation to better academic achievement, improved wellbeing and reduced test anxiety. Particularly, students with better mental wellbeing, higher Emotional Intelligence, more Self-Efficacy (general and academic) have a longer average sleep duration and better sleep quality. Further, results show that assessment is detrimental to sleep the night before an exam, and for students with high test anxiety, following an exam. Overall, taking into account predictive validity the main predictors of good sleep are Extraversion, Optimism, Self-efficacy and Emotional Intelligence in association with satisfaction with life.

5.1 Introduction

Sleep is reported to be essential for memory consolidation and learning (Diekelmann, 2009; Fenn & Hambrick, 2011; Maquet, 2001), cognitive performance and function (Dement, 2005; Harrision & Horne, 2000; Lim & Dinges, 2010) wellbeing and quality of life (Gaultney, 2010; Lund, Reider, Whiting & Prichard, 2010) and academic performance (Curcio, Ferrara & Gennaro, 2006; Dewald, Meijer, Oort, Kerkhof & Bogels, 2010; Galambos, Howard & Maggs 2010; Howell, Jahrig & Powell, 2004; Taras & Potts-Datema, 2005; Wolfson & Carskaden, 2003). The average recommended sleep time for young adults is 8 hours (National Sleep Foundation, 2008; Roehrs, Shore & Papineau et al., 1996). However, it is a common finding that many students experience sleep deficiencies

including partial sleep deprivation (Frederiksen, Rhodes, Reddy & Way, 2004; Spilsbury, Drotar, Rosen, & Redline, 2007) for example less than 5 hours in 24 (Meijer, Habekothe & Wittenboer, 2000; Pilcher & Huffcutt, 1996). They experience both poor sleep quantity (sleep duration or amount of sleep) (Tsai & Li, 2004; Urner, Tornic, & Bloch, 2009), and poor sleep quality (how well an individual sleeps) (Lund et al., 2010), irregular sleep and wake times (Lund et al., 2010; Tikotzky & Sadeh, 2012) and delayed sleep phase syndrome (Carskadon, Vieira, & Acebo, 1993). This is biologically linked to pubescence and so is particularly salient in adolescents but still has some impact upon university students, although the desire to sleep longer in the morning is reported to be less pronounced (Urner et al., 2009). Such sleep decrements can have detrimental effects on wellbeing, mental health, mood, daily function and academic performance (Eliasson, Eliasson, King, Gould & Eliasson, 2002; Meijer et al., 2000; Smaldone, Honig & Byrne, 2007; Taras & Potts-Datema, 2005).

Student sleep

Numerous factors can affect students' sleep including social demands, environmental conditions and genetic determinants (Archer, Robilliard, & Skene et al., 2003; Randler, 2008). Many young adults have a preference for later bedtimes; much research has focused on mid to late adolescence and noted that children have to get up early for school, which causes a phase delay (Carskadon et al., 1993) and consequently undesirable sleepiness, which is a common occurrence amongst students of both high school and college age (Eliasson et al., 2002; Eliasson, Lettieri, & Eliasson, 2010; Sadeh, Raviv & Gruber, 2000). Urner et al., (2009) found that although there was some change, individuals tended to have a similar total sleep time and mid-sleep time suggesting sleep traits are maintained from adolescence throughout university. Lund et al., (2010) found that college students demonstrated insufficient sleep, similar to that in high school students as did Curcio, Ferrara and Gennaro, (2006) in their extensive review. Many students have more flexible lifestyles, including varying lecture times, which can cause irregular sleep-wake patterns (Sadeh, Dahl, Shahar, & Rosenblat-Stein, 2009). Irregular sleep has been reported to have detrimental effects on performance and wellbeing (Lund et al., 2010; Tikotzky & Sadeh, 2012).

Students frequently exhibit irregular sleep–wake patterns (Manber, Bootzin, Acebo & Carskadon, 1996) depending on their individual circumstances, for instance work, study

habits and daily activities (Machado, Varella & Andrade, 2010). In a study on 2000 adults, Groeger, Zijlstra and Dijk (2004) found that 58% of respondents reported some sleep difficulties; this was perceived to affect their daily performance and their quality of life. Circadian rhythm is the 24 hour cycle that influences sleep quantity and quality; research suggests that the more consistent this is (systematic bed and wake times) the better sleep a person has and indeed the better academic performance (Forquer, Camden, Krista, Gabriau & Johnson, 2008; Gomes, Tavares & Azevedo, 2002; Harrison, 2013).

Academic performance

Findings denote that sleep deprivation impairs prefrontal cortex regulation; such problems with executive function can impact upon learning, memory (namely, a decrease in memory efficiency) and emotional regulation (Gaultney, 2010; Tikotzky & Sadeh, 2012). Further, consolidation of newly acquired information is thought to take place during sleep and is considered essential to long-term academic achievement (Stickgold & Walker, 2005). BaHammam, Abdulrahman and Abdulmajeed, et al., (2012) found a clear association between sleep-wake patterns and academic performance for medical students; specifically earlier bedtimes and longer total sleep time was associated with 'excellent' academic performance. Banitt, (2002), Eliasson et al., (2010) and Trockel, Barnes and Egget (2000), reported students with earlier bed and rise times had better performance and Najomi, Bandi and Kaffashi (2009) looked at sleep patterns in medical students and found that a higher workload was associated with going to bed later, insomnia and parasomnia, which in turn was associated with decrements in performance. Taylor, Vatthaeur, and Bramoweth et al., (2011) found later bedtimes, later and inconsistent sleep-wake schedules, poorer sleep efficiency and poorer sleep onset latency to be associated with lower Grade Point Average (Besoluk, Önder, & Deveci, 2011; Borisenkov et al., 2010; Eliasson et al., 2010). However, it was not a significant predictor in Gomes's (2011) study suggesting perhaps that it is mediated by other variables. Kelly, Kelly and Clanton (2001) found shorter sleepers reported significantly worse academic performance than long sleepers; poorer academic performance has been consistently associated with shorter sleep duration (Borisenkov et al., 2010) however, Dewald, Meijer and Oort et al., (2010) found the effects of sleep duration to be much smaller than the effects of sleep quality as measured by actigraphy. Kelly et al., (2001) also reported an association between poor sleep quality and academic performance and such findings have been replicated in numerous studies (Gilbert & Weaver, 2010; Gomes et al., 2011; Howell et al., 2004).

In addition to sleep duration and quality, a shift delay in bedtimes has been associated with impaired academic performance (Wolfson & Carskadon, 2003); this often happens through a discrepancy between weekend and weekday evening sleep (Gaultney, 2010; Lund et al., 2010) particularly as sleep delay can accumulate over several weeks. Thus, regularity in sleep is deemed to be important to academic performance (Doghramji, 2008; Gomes, Tavares, & Azevedo, 2002; Randler & Frech, 2006). Medeiros, Mendes, Lima and Araujo (2001) reported significant correlations between sleep onset, sleep length, and irregularity of sleep with academic performance; those who took longer to fall asleep, had shorter sleep and more irregular sleep, had worse academic outcomes. Gomes et al., (2011) found an association between irregular sleep and lower academic performance, but found duration and quality to be more important to academic performance than maintaining regular sleep-wake schedules.

There is some debate on time in bed and total sleep time (duration) with Pilcher et al., (1997); Wolfson and Carskadon, 2003; Kelly, Kelly and Clanton, (2001) finding a positive relationship with time in bed and total sleep time and some finding no relationship with time in bed or total sleep time (Eliasson, Eliasson & King, 2002). Howell et al., (2004) reported that low (less than six hours) and high (more than 10 hours) total sleep time was related to worse academic performance but average total sleep time (7-8 hours) was not associated. With inconsistent reports on time in bed and duration (Anderson, Sorfer-Isser, Taylor, Rosen & Redline, 2009; Dewald, et al., 2010) the overriding consensus leans toward quality being the most important sleep predictor of academic performance. Orzech, Salafsky and Hamilton, (2011) reported that as sleep quality improved, there was a modest increase in Grade Point Average. Sleep quality (also known as sleep efficiency) is how well an individual sleeps and includes sleep onset and sleep maintenance (Howell, Jahrig & Powell, 2004; Pagel & Kwiatkowski, 2010). Sleep quality can also affect mood, concentration, wellbeing and daytime alertness (Orzech, Salafsky & Hamilton, 2011). In a recent meta-analysis, Dewald et al., (2010) found that sleepiness had the strongest association to academic performance, followed by sleep quality and then sleep duration; the effect sizes for these correlations were however, quite small. The first study using actigraphy (school age students) found that increased daytime sleepiness has the most impact (Sadeh, Raviv & Gruber, 2000) on academic outcome. Howell, Jahrig and Powell, (2004) also, suggested some students may sacrifice sleep in order to study longer, creating a poor sleep cycle.

Galambos, Dalton and Maggs, (2009) explored whether sleep quantity and quality were affected by the knowledge that a quiz or exam was scheduled the next day (this study did not differentiate between a quiz and an exam; whether the quiz or exam was assessed, contributed to the students' overall marks etc., could have confounded the results). The results indicated that students slept for less time (approximately 30 minutes) the night before an exam but did not report whether this knowledge affected sleep quality in addition to duration. Moreover, students indicated day to day fluctuation in sleep quantity and quality, this irregularity was noted but not assessed in relation to wellbeing or academic performance; further, the assessments were made using only the Pittsburgh Sleep Quality Index (PSQI). The results of this study indicate that sleep quality and quantity affect study habits and wellbeing but direct associations with academic performance and wellbeing have not been explored. Further, sleep quantity and quality appear to be used interchangeably. The effects were examined day to day but not on a long-term or overall basis.

In one of the few actiwatch studies, Killgore, Estrada, Wildzunas and Balkin, (2008) found that the students who had poorer sleep latency, less assumed sleep and less sleep efficiency (quality) in the two nights preceding an exam performed significantly worse than those who had better sleep. This corroborates with research by Thacher (2008) and Galambos et al., (2010) that report the practice of pulling an 'all-nighter' is associated with lower Grade Point Average. It is thought that before an exam, students may engage in a cramming exercise, whereby they are awake for all or part of the night; implications of a night without sleep could be serious, affecting sleep-wake cycles and ultimately mood, wellbeing and academic performance (Thacher, 2008). Poor sleep quality was associated with high stress and low academic performance in a group of medical students pre-exam but general poor sleep was not associated with lower academic performance; poor sleep was however, experienced by less students during the semester compared to exam period (29 vs. 59%) (Ahrberg, Dresler, & Niedermaier et al., 2012). Perceived stress was linked to poor sleep and consequently to poorer grades, possibly creating a cycle of maladaptive experiences and behaviours.

In sum, research has indicated that later time in bed, later sleep-wake schedules, shorter duration, inconsistent duration or total sleep time, loss of sleep the night before an exam, irregular sleep patterns and daytime sleepiness appear to be associated with poorer academic performance (Eliasson et al., 2010; Medeiros et al., 2001; Trockel et al, 2000;

Carney, Edinger, Meyer, Lindman & Istra, 2006; Taylor et al., 2011; Dewald et al., 2010; Thacher, 2008). However, it could be that students who are less able to cope with academic demands experience sleep disturbances (Galambos et al., 2009). Despite much evidence for the effects of poor sleep, the results are inconsistent and warrant further investigation.

Mood and wellbeing

Irregular sleep patterns are also associated with fatigue and lower mood (Gomes et al., 2011); poor sleep quality has shown to be related to anxiety (Eller, Aluoja, Vasar, & Veldi, 2006) and sleep deficiencies have been associated with mood and anxiety disorders (Steiger, 2007). Test anxiety has shown to be associated with shorter sleep duration (Bailey, Onwuegbuzie, & Daley, 2000; Harrison & Horne, 2000; Hicks, Pellegrini & Hawkins, 1979); although some anxiety is useful (Yerkes-Dosdson curve), it is likely that higher levels of anxiety and higher levels of test anxiety would be related to poor sleep and poorer academic performance (Taylor, Vatthauer & Bramoweth et al., 2011). Kajimura, Kato and Sekimoto et al., (1998) found a distinct difference in the sleep patterns between individuals with high and low anxiety. Further, a positive association between sleep quality and mental health has been reported (Kaneita, Yokoyama & Harano et al., 2009), particularly that poor sleep quality, including longer onset latency, is associated with higher levels of anxiety (Kajimuru et al. 1998; Ramsawh, Stein, Belik Jacobi & Sareen, 2009; Orsal, Orsal, Alparslan & Unsal, 2012).

Experimental studies have shown that sleep deprivation is associated with somnolence, anxiety and depression (National Sleep Foundation, 2005; 2006; Frederiksen, et al., 2004 Manber et al., 1996). Further, research indicates that a shift in sleep time is associated with mood changes and increased depression (Gaultney, 2010; Wolfson & Carskadon, 2003; Curcio et al., 2006). Although some effects of sleep deprivation on mood have been modest (Pilcher & Walters, 1997) more recent research has demonstrated that shorter sleep duration and poorer quality sleep can have a negative impact upon mood, increase depression, lead to higher anxiety levels and increase fatigue (Alapin, Fichten, & Libman et al., 2000; Buboltz, Loveland & Jenkins et al., 2006; Elliasson et al., 2002; Fuligni & Hardway, 2006; Galambos, Dalton & Maggs, 2009; Galambos, Howard & Maggs, 2010; Gaultney, 2010; Lund et al., 2010). Mixed results have been found in relation to positive affect and negative affect; Gray and Watson, (2002) found that positive affect was associated with quality but not quantity and other research has shown positive associations

between positive affect and both sleep quality and quantity (Carney, Edinger & Meyer et al., 2006; Fortunato & Harsh, 2006; Fuligini & Hardway, 2006; Galambos et al., 2009; 2010). The evidence concerning negative affect is much more varied. Fuligini & Hardway, (2006) reported positive associations between sleep quantity and negative affect the next day, whereas there was no association with negative affect and sleep that particular night. In line with this, Galambos et al., (2009) investigated the effects of self-reported sleep on positive and negative affect and found that less sleep (alludes to duration, not quality) preceded increased negative affect which in turn was associated with less time spent on school work and more time spent socialising; the effects of this on academic performance were not explored. Although negative affect was influenced by previous night's sleep it was not associated to sleep the night negative affect was reported. Better sleep quality was associated to positive affect the next day which promoted more academic effort and decreased stress. These results were replicated in their 2010 study.

In a study on sleep in relation to academic performance and wellbeing, Gomes, Tavares, and Azevado, (2011) found that sleep phase, sleep deprivation, sleep quality and sleep irregularity were related to two measures of academic performance. Following a stepwise multiple regression sufficient sleep and sleep quality remained significant but none of the remaining sleep variables or wellbeing variables did; suggesting sleep quality and irregularity impact upon performance but show little influence over wellbeing. Pilcher et al., (1997) found sleep quality to be a much more robust predictor of health and wellbeing than quantity and Soehner, Kennedy and Monk, (2007) found more evidence of manic symptoms to be associated with later sleep-wake times. Orzech, Salafsky, and Hamilton (2011) found that poor sleep affected both academic performance and wellbeing. The strength of this study was that they collected both self-report data and interviewed their participants. This study did not however, use validated wellbeing measures and acquired self-reported Grade Point Average.

Despite numerous studies looking at the effects of sleep on mood there has been little attention given to Emotional Intelligence. However, Killgore, Kahn-Greene and Lipizzi et al., (2008) found that sleep deprivation was associated with decreased global emotional intelligence scores. Emotional intelligence includes qualities such as self-awareness, mood management and regulation, interpersonal skills, the ability to cope in difficult situations and the ability to adjust to change (Bar-On & Parker, 2000; Petrides, Pita & Kokkinaki, 2007). Sleep deprivation affects empathy and the ability to control impulses (Bechara &

Van Der Linden, 2005; Spinella, 2004; Spinella, 2005) which may lessen emotional intelligence. Unlike previous studies, this study will not look at the effects of sleep deprivation on emotional intelligence but will consider whether emotional intelligence provides some protection against poor sleep (for detailed information on emotional intelligence see chapter 3). The current chapter extends this research by bringing these elements together and combining them with validated self-report measures and objective actigraphy. Evidence for the association between sleep and wellbeing is mixed providing justification for further exploration.

Personality

It may be that higher levels of Emotional Intelligence and certain personality traits may protect against sleep difficulties, whilst lower emotional intelligence and other personality traits may perpetuate this insalubrious cycle of poor sleep, poor wellbeing and poor performance. Gomes et al., (2011) considered the relationship of Sleep and daytime functioning with Neuroticism but found it not to be significant. Whilst, earlier research by Gau (2000) found Neuroticism to be highly associated with poor sleep quality in a group of adolescents. Further, Soehner, Kennedy and Monk (2007) found neuroticism to be related to poorer sleep as indicated by higher Pittsburgh Sleep Index scores, including more wakefulness after sleep onset. None of the personality variables in this study (Extraversion- Kennedy & Monk's research considered only Neuroticism and Extraversion, not Conscientiousness, Openness or Agreeableness) affected duration however, suggesting that Neuroticism affects aspects of timing and subjective sleep quality but not duration. According to Soehner et al., (2007) perceptions of sleep are as important as objective sleep and such perceptions may depend somewhat upon personality. They also report that the circadian rhythm of an individual may be related to personality, reporting that individuals higher on extraversion have a later phase than more introverted individuals, with those higher on neuroticism being more affected. Individuals with Neuroticism are reported to experience undesirable consequences with shift changes and altered sleep patterns (Costa, Sartori & Facco et al., 2001; Saksvit, Bjorvatn, Hetland et al., 2011). Randler (2008) found Neuroticism to be related to evening preference; eveningness has shown to be a negative predictor of academic performance (Randler, 2008; Preckel, Lipnevich & Boehme et al., 2011).

Gray and Watson (2002) reported that Conscientiousness was a substantial predictor of academic performance. Specifically, that conscientious students maintain early sleep-wake schedules, being more disciplined and achievement oriented, leading to better academic performance. Conscientious students also reported consistently higher quality sleep. Preckel et al., (2011) corroborates these findings, reporting that Conscientiousness is positively related to morning preference, which, did not translate into better performance. Randler and Frech (2006) however, found morningness to be highly correlated with final exam grades. Further, Preckle et al., (2011) found that Conscientiousness was negatively associated to eveningness (which, unlike morningness, was associated with academic performance). DeYoung, Hasher, Djikic et al., (2007) reported that Agreeableness was also related to morning preference and Randler, (2008) found morningness to be associated with both Conscientiousness and Agreeableness, however Agreeableness lost significance in the adult sample, remaining only in the 10-17 age group. It could be that the association with Conscientiousness and Agreeableness is mediated by a preference for morningness. Conscientiousness and Agreeableness are also reported to be related positively to sleep length (Randler, 2008). It is clear from the literature that the evidence for an association between sleep and personality is varied and limited and so warrants further investigation.

Current Study

The studies here indicate the seriousness of sleep deficiencies on academic performance, mood states and mental wellbeing. Their limitations however, lie in the fact that most rely on self-report measures to assess the quantity and quality of sleep. They also provide little information on how academic performance is assessed and do not fully consider confounding variables. As noted by Dewald et al., (2010) due to the methodological differences between studies and inconsistent results, it is difficult to draw definitive conclusions about the relationship between sleep and other variables such as academic performance and wellbeing. As recommended by Dewald et al., (2010) and Galambos et al., (2010) this study will explore sleep using Actigraphy in addition to self-reported sleep measures and in light of the call from Brick, Seely and Palermo (2010) and Taylor et al., (2011) this study will use more comprehensive measures and predictor variables.

Further, as suggested by Gray and Watson (2002), all three measures of sleep (quantity, quality and schedule) have been included in this research and are measured simultaneously. The current study explores the three main and distinct aspects of sleep: sleep quantity

(duration), sleep efficiency (sleep quality), and sleep variation and irregularity (from low workload to high workload conditions). Moreover, it combines these observed sleep practices with personality variables, emotional intelligence, wellbeing (including mood, general mental health and level of alertness) and academic performance. As stated by Curcio et al., (2006) the use of multiple measures and predictor variables may be the best way to overcome methodological limitations and strengthen research findings as suggested by Wolfson and Carskadon, (2003). Despite this suggestion few studies have adopted this approach. Further a combination of objective and subjective indicators (Actiwatch, academic performance and self-report) preclude the problem of shared method variance.

Conclusions

The literature leads to the following conclusions and hypotheses:

H_1. Students will sleep less than is recommended for adults of their age.

H_2. Numerous self-reports but little objective data exists on whether students lose sleep before an exam, so the current research will objectively measure whether students do lose sleep the night before the exam (possibly due to cramming) and what implications this may have; it is predicted that sleep loss will occur.

H_3. Students will spend longer in bed during the low workload week, compared to the high workload week and so high workload will have a detrimental impact upon sleep.

H_4. The pattern across the days of the week will be different in the high workload condition compared to low workload, depending upon the academic deadline (in this case, Thursday of the high workload week).

H_5. Student sleep-wake schedule will be irregular and the pattern of sleep quality will change from low workload week to high workload week. Sleep onset will also vary depending on workload.

H_6. Earlier bedtimes and better sleep will be associated with better academic performance,

H_7. Based on the literature it is hypothesised that Emotional Stability (the positive of Neuroticism), Conscientiousness and Agreeableness will be positively related to better sleep and more consistent sleep-wake schedules; which variables of sleep in particular is not specified, however better duration is indicated. Based on mixed findings and lack of

research with regard to the other personality variables no association or direction is specified but it is stipulated that extraversion and openness may provide some protection against the effects of sleep loss. This is tentative and based on the positive associations with Conscientiousness.

H_8. Earlier bedtimes and better sleep will be associated with academic and general self-efficacy, lower test anxiety, better mood, increased alertness, less test anxiety, higher emotional intelligence and better mental wellbeing. Sleep disturbance and daily dysfunction will also have a negative effect on these variables.

The main focus of the current study is to explore the differences in sleep between low workload and high workload weeks and to consider the association of good and poor sleep on individual difference variables.

5.2 Method

Design

This study is a repeated measures (quasi i.e., there was no control group) experimental design that is enhanced by self-report measures (cross-sectional correlation design). The experimental variables and the self-report measures are aligned with concurrent academic performance indicators.

Participants

The present sample comprised N = 32 participants, the majority were female (m=11; f=21) aged 21–25 years (mean age =23.68) and most were Malaysian (96%), the remaining 4% were British. An opportunity sample of Malaysian undergraduate students attending a British Psychological Society summer top up course, and a small number of UK undergraduate students studying Applied Psychology, took part. This three-month course is designed to bring the Malaysian students up to the standard expected by the British Psychological Society. Malaysian students were used as they were available at the time of conducting the study, funds were available to conduct this study over the summer period when UK undergraduates were not available and, most importantly, it was possible to measure a low workload week, compared to a high workload week, within a short period of time. It is expected that retention would be much lower with a UK cohort as the period of time between low workload and high workload would be much longer. None of the participants suffered from sleep difficulties or took medication for sleep or medications

that affected sleep. Morning and evening types were not controlled for, nor were those that had regular daytime naps.

Materials:

Actimetry

Participants wore an Actiwatch (Cambridge Neurotechnology) each night, which was attached to the dominant wrist. Time of lights out was recorded in a sleep diary. Time in bed was determined as lights off to lights on. Assumed sleep was determined by the Actiwatch as time of falling asleep to time of waking, not taking into account wake periods. Actual sleep was monitored by the Actiwatch and included total time actually asleep, taking into account wake periods. Sleep Efficiency was calculated by the Actiwatch as the overall percentage of sleep experienced between the first sign of sleep and final wake. Endorsed by Killgore et al., (2008), the Actiwatch measures bodily movements and is used in an individual's natural environment, providing an unobtrusive, objective measure of sleep.

Self-report Measures

A comprehensive range of self-report measures were distributed to the participants (see Appendix 3). The measures included were chosen to capture a good array of individual differences. These included personality, emotional intelligence, emotional self-efficacy, academic self-efficacy, academic conscientiousness and mental wellbeing, and subjective sleep was also measured. All measures were selected on the basis that they are associated with the constructs highlighted in the relevant literature, and have sound psychometric properties, for instance good reliability, factor structure and predictive validity. Each measure is summarised below.

Sleep Diary

Each morning upon waking, participants recorded details of their perceived sleep. This included time in bed, time of lights out and estimated times of sleep onset (e.g., how long from lights out it took to fall asleep) and time of final awakening. Participants also recorded how many times they thought they awoke in the night, how long they believe they were awake for and reasons for waking (e.g., noise, toilet, Physical discomfort etc.). They also recorded their subjective sleep quality, mood when woke up and level of alertness (0=very bad to 7=very good).

Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds, Monk, Berman, & Kupfer 1989).

The Pittsburgh Sleep Quality Index has 10 questions that are related to sleep, including sleep quality and sleep disturbance over the previous month. The questions cover subjective sleep quality, sleep latency and sleep efficiency; also use of medication and daytime dysfunction (Gray & Watson, 2002; Howell et al., 2004). The first four questions relate to usual time of going to bed, how long it usually takes to fall asleep, time usually get up and usual hours of actual sleep per night. Following these four questions there are 6 questions that are all rated on a 4-point scale; lower scores indicate better sleep and higher score indicate poorer sleep. This scale has 10 items and addresses why a person might have experienced trouble sleeping in the past month e.g., trouble sleeping because 'cannot get to sleep within 30 minutes' or 'have to get up to use the bathroom.' In question 6 participants are asked to rate their overall sleep quality during the past month, responses range from 1 'very good' to 4 'very bad.' Question 7 asks about medication, question 8 about trouble staying awake during the day (whilst driving, eating or socialising) and question 9 about how difficult it has been to keep up enthusiasm for things. Question 10 was removed as no participants had a bed partner or roommate.

Academic Measures

The Academic Self-efficacy Scale (McIlroy & Bunting, 2002)

This is a 10-item scale with items ranging from 'I am confident that I can achieve good exam results if I really put my mind to it' to 'I fear that I may do poorly in my end-of-semester exams'. Participants responded on a 7-point Likert format ranging from 1 (very strongly agree) to 7 (very strongly disagree). The measure was constructed to reflect self-efficacy beliefs and behaviours exclusively within the domain of academia. Seven of the ten items are reverse scored and the higher scores represented higher levels of perceived competence. The measure has demonstrated excellent internal consistency, with a high reliability of 0.87, and a robust predictive validity of r = 0.37. Cronbach's alpha demonstrated good internal consistency in the present sample (α =.89).

The Academic Conscientiousness Scale (McIlroy & Bunting, 2002).

This is a 10-item scale with items ranging from 'I go to work on my assignments immediately after learning what the titles are' to 'I seldom work as hard at my studies as I

intend'. Participants responded on a 7-point Likert format ranging from 1 (very strongly agree) to 7 (very strongly disagree). The measure was constructed to reflect conscientious behaviours exclusively within the domain of academia. Higher scores represent higher levels of perceived competence. Cronbach's alpha demonstrated acceptable internal consistency in the present sample (α =.82).

Measures of academic performance

Module specific averages and cumulative Grade Point Averages and final degree classification were collected from the School database. Each student was assessed by a mixture of coursework and exam. Grade Point Average is recorded as the mean scores across modules.

For details of other measures please see previous chapters (1-4): for the Five Factor Model see chapter 1; for Self-effiacy and Test Anxiety see chapter 2; Emotional Intelligence chapters 3 and 4; wellbeing and quality of life chapter 4.

Procedure

The self-report measures were distributed to the participants during a regular seminar session. Each self-report bank took approximately 30 minutes. Study information, consent forms and guidelines for completing the forms were provided in written form at the beginning of the self-report bank (see appendix 2.4 to 2.5). It was explained to the participants that their grades would be accessed through the central admissions system. The Actiwatches were given out in four blocks, the students attended the laboratory to collect and return watches. As compensation for their time, participants were rewarded with Tesco vouchers to the value of £20 upon completion of the study; this was approved by LJMU ethics committee. Each participant was monitored by wrist actimetry for 14 nights in total. There were two conditions: for 7 nights students were considered to have low workload (reading and attending sessions with no work due); for the other 7 nights students were considered to have high workload (coursework deadlines and an exam). Order effect was controlled for as data collection was done in four stages, for instance group one were monitored during low workload week first (no coursework or exams), followed by high workload week (week of the Occupational Psychology exam) and group two were monitored during high workload week first (week of the Occupational

Psychology exam), followed by low workload week (the week following the exam, when no coursework or exams were pending). The students' academic performance was combined with sleep data and current self-reports to facilitate testing the association of sleep and personality measures with academic performance. The academic results were taken from final year modules and overall Grade Point Average and degree classification. Data analysis includes descriptive and inferential statistics and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled.

Statistical Analysis

All data were tested for assumptions in relation to normality, reliability and the potential for type 1 errors was accounted for. Correlations, multiple regression analyses, hierarchical regression analyses and Analyses of variance were employed to test the hypotheses and parametric statistics were engaged as the assumptions of normality and interval level data were fulfilled, and levels of skewness and kurtosis were consistently low (typically < 1.96). Any missing data were input as -9.

5.3 Results

Table 5.1: Descriptive Statistics with Skewness and Kurtosis for Average Absolute Sleep (mins), FFM, Academic Measures, EI, Test Anxiety and Wellbeing Measures

	Mean[mins] (mid points)	Standard Deviation	Skewness	Kurtosis
Average TIBL	466.77	51.61	-.032	-1.406
Average TIBH	461.32	64.12	.268	.349
Average ASSSLL	450.09	52.00	.014	-1.393
Average ASSSLH	443.97	61.46	.189	.962
Average ACTSLL	408.75	49.28	-.216	-.624
Average ACT SLH	397.23	65.71	.028	-.163
Average SEL %	86.53	5.07	-.552	.050
Average SEH %	84.47	7.08	-1.209	.606
Openness	33.18(30)	7.26	-.187	-.166
Conscientiousness	33.96(30)	6.27	.239	-.402
Extraversion	32.25(30)	7.02	-.133	-.588
Agreeableness	39.40(30)	4.88	.035	-.540
Emotional Stability	29.65(30)	8.93	-.059	-.537
General Self-Efficacy	29.06(25)	5.36	-.697	.803
Academic Self-Efficacy	47.18(40)	6.70	-.418	-.424
Academic Consc	36.28(40)	9.39	.350	-.452
Test Anxiety Total	76.75(80)	21.39	-.445	-.652
Worry (TA)	24.96(24)	8.02	-.201	-.458
Tension (TA)	22.90(20)	7.26	-.761	- .665
Bodily Symptoms	14.37(20)	7.25	.679	-1.271
Test Irrelevant Thoughts	14.50(16)	6.52	-.215	-.634
AES	123.28(99)	18.26	-.207	- .129
TEIQ	141.03(120)	25.56	.115	-.879
TMMS	108.07(90)	13.96	-.217	-.719
ANXIETY	8.40(0-7)	4.08	.289	-.325
DEPRESSION	4.71(0-7)	3.08	.409	-1.066
SWL	24.56(17)	5.79	-.270	-.557
LOT	12.29(12)	3.67	-.413	-.296
GHQ-12	13.68(12)	4.95	.481	-.033
NA	21.71(25)	9.59	.826	-.334
PA	34.21(25)	7.25	-.360	.298
HSE	27.31(28)	6.08	-.697	.616

Key: TIBL/H = Time in bed low/high; ASSSL/H = Assumed sleep low/high; ACTSLL/H = Actual sleep low/high; SEL/H = Sleep efficiency low/high (for other abbreviations see previous tables or list of abbreviation)

Means and Standard Deviations for Average Sleep Variables

Table 5.1 illustrates that in the low workload condition the mean for average time in bed is 466.77 minutes, whilst in the high workload condition the mean for time in bed is 461.32 minutes, with a standard deviation of 64.12 compared to 51.61 for the low workload condition. This shows that students spend longer in bed when workload is low compared to when workload is high. This pattern continues for assumed sleep and actual sleep and is reflected in the means and standard deviation for sleep efficiency. Further, standard deviations are consistently lower for the low workload condition compared to the high workload condition. This illustrates that there is a wider variation of sleep amongst students when workload is high.

Means and Standard Deviations for the Five Factor Model of Personality

Agreeableness (as in the previous chapter) is revealed as the highest mean score amongst the factors; Agreeableness also has the tightest dispersion. As expected, Conscientiousness is falling slightly above the mid-point, showing as marginal. As illustrated in chapter one the Five Factor Model scores generally demonstrate the kind of responses that might be expected from a student sample, for instance the different mean scores, high reliabilities and good dispersion within each factor suggest discriminatory and systematic response patterns. High reliabilities were also elicited (see Methodology). The mean scores on the Five Factor Model are within the parameters 32.25 (Extraversion) to 39.40 (Agreeableness) and so are clustered above the midpoint which is 30 for each factor. The substantial SDs on each factor (range 4.88 to 8.93), tightest as expected for Agreeableness and widest for Emotional Stability which reveals strong individuality of responses within the sample – with no extreme scores (i.e. > 41). This is also consistent with the findings in chapter one.

Means and Standard Deviations for Emotional Intelligence

On all of the emotional intelligence measures the responses generally show a positive orientation within the sample, with mean scores nested in the higher parameters of each scale (above scale midpoints: 99, 120 and 90 respectively on the Assessing Emotions Scale Trait Emotional Intelligence Questionnaire and Trait Meta Mood Scale. This may suggest that many of the students in the study are able to cultivate emotional regulation and self-management.

Means and Standard Deviations for Test Anxiety, General and Academic Self-Efficacy

Test anxiety total score is marginally lower than the midpoint (80) but there is a large spread suggesting that some students are still experiencing high levels of test anxiety. This is reflected in the subscales, worry and tension; lower scores are experienced for bodily symptoms and test irrelevant thoughts (although the latter is on a slightly smaller metric). The mean for the general self-efficacy is above mid-point (25) suggesting most students are generally self-efficacious. The means for the academic measures are as expected: higher for academic self-efficacy and lower for academic conscientiousness. In line with previous research it appears students have confidence in their ability (self-efficacy) but not application (conscientiousness) (McIlroy & Bunting, 2002).

Means and Standard Deviations for Subjective Wellbeing

Finally, with regard to the wellbeing measures students generally fall within the positive parameters (hope, satisfaction with life, optimism, health self-efficacy and positive affect (see chapter table 5.1 for midpoints). As expected students score within the normal range for depression (0-7), but their score for anxiety suggests they are at the low end of mildly anxious (8-14) and below the midpoint (25) for negative affect; lower scores represent lower anxiety and depression and lower negative affect. Further, students have scored in the lower parameters for the General Health Questionnaire-12, as lower scores represent higher wellbeing; however they are just above the typical range of 11-12 scoring 13.68.

The good quality of the data is demonstrated with low levels of skewness and kurtosis (range: .014 to -.164 and .050 to 1.406 for skewness and kurtosis respectively) and not statistically significant ($p<1.96$). Strong individual differences across the self-report measures are indicated by the measures of dispersion (standard deviation) reflecting response deviation from the means.

Non-Parametric Circadian Rhythm Analysis was conducted - the results were not significant for interdaily stability and intradaily variability; however, there were significant findings for sleep onset of least active 5 hours, specifically a significant effect of workload ($p=.04$) on a one-tailed basis. Also, for sleep onset of most active 10 hours, specifically a significant effect of workload ($p=.02$) and gender x workload interaction ($p=.03$). This illustrates variability in sleep onset, particularly in the high workload condition. The remaining results focus on the differences and variation between weeks considering high workload (in this case students sat an exam) and low workload, students were attending

classes but did not have any deadlines. Correlations between low workload, high workload and self-report data were also explored and those that were significant on a two-tailed test were entered into multiple and hierarchal regression analyses.

Table 5.2: Means, Standard Deviations and Repeated Measures ANOVA for Daily Time in Bed (TIB), Assumed Sleep, Actual Sleep, Sleep Efficiency (SE) and Rise Times (Actiwatch) in minutes for High and Low Workload Weeks

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	WEEK(H/L)	Days(H/L)	Interaction
Mean TIBL	459.18	469.67	473.71	506.31	429.84	456.09	473.40			
SD TIBL	99.36	68.01	97.43	92.18	124.06	118.90	101.99			
								ns	f(6)=1.944*$_1$	f(31)=3.874***
Mean TIBH	506.68	484.96	454.15	410.28	432.21	494.40	446.56			
SD TIBH	83.10	106.86	118.58	113.83	131.51	125.36	123.77			
Mean ASSL	444.03	451.45	440.68	492.68	415.59	441.56	465.25			
SD ASSL	105.42	61.32	120.61	91.74	122.79	114.57	107.81			
								ns	ns	f(31)=3.363**
Mean ASSH	483.03	466.43	453.53	396.03	413.50	464.78	430.53			
SD ASSH	85.30	107.43	96.49	132.30	133.02	138.55	122.89			
Mean ACTL	406.18	405.64	414.28	443.06	362.18	403.31	427.21			
SD ACTL	105.07	54.78	83.77	92.86	110.87	99.98	117.20			
								ns	ns	f(31)=2.821*
Mean ACTH	429.49	404.84	404.31	361.62	369.31	428.62	385.43			
SD ACTH	120.57	110.45	83.40	118.88	121.44	131.36	139.19			
Mean SEL (%)	87.00	86.46	86.62	87.22	84.74	86.98	86.73			
SD SEL (%)	7.46	6.07	6.46	7.80	8.42	13.52	10.15			
								f(1)=3.174*$_1$	ns	ns
Mean SEH (%)	84.39	83.59	85.97	83.86	83.97	85.44	84.06			
SD SEH (%)	14.86	12.87	7.30	15.40	12.40	14.03	6.77			
Mean RTL	70.06	96.56	79.12	86.46	73.96	54.06	108.00			
SD RTL	106.56	105.40	104.66	132.11	115.77	151.04	122.45			
								F(1)=19.696***	ns	ns
Mean RTH	4.53	17.43	32.09	28.96	1.09	50.34	34.21			
SD RTH	110.61	79.52	120.98	121.63	127.24	121.19	105.87			

*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed) *1p<.05 (one-tailed) ns = non-significant. ***NB. Sleep time is calculated by number of minutes from midnight; wake time is calculated by number of minutes from 8am.*** Key: RTL = Rise times low workload RTH = Rise Times High Workload (for other abbreviations see table 1).

Repeated Measures ANOVA for Absolute Sleep (Actiwatch)

For Time in Bed repeated measures ANOVAs revealed that the main effect between weeks was not significant, illustrating there is no difference between the high workload week and low workload week in terms of average sleep. Although, on average students appear to be going to bed 60 minutes earlier in the high workload condition. Comparing days, post hoc tests reveal there is a significant effect between days in each week, illustrating that the pattern across the days in each week does alter ($f(31)=3.874$, $p<.001$). There is also a significant interaction ($f(31)=3.874$, $p=001$) showing there is a different pattern in weeks one and two, with the most obvious difference on Thursday (see figure 1a).

For Assumed Sleep, neither the main effect nor the difference between days is significant but there is an important interaction $f(31)=3.363, p=.004$, again the most obvious difference is on Thursday (see figure 1b).

Actual Sleep follows the same pattern as Assumed sleep, whereby neither weeks nor days are significantly different, but there is a significant interaction $f(31)=2.821, p<.01$ (see figure 1c).

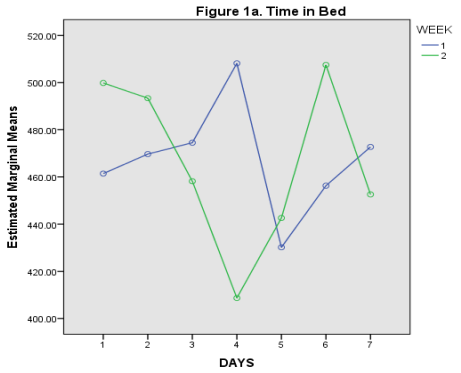
The main effect for Sleep Efficiency is significant illustrating that how well students sleep differs between week one (low workload) and week two (high workload). There is no effect for days and no significant interaction, suggesting sleep efficiency for both weeks follows the same pattern for each day but shifts, showing reduced sleep efficiency in week two (high workload) (see figure 1d).

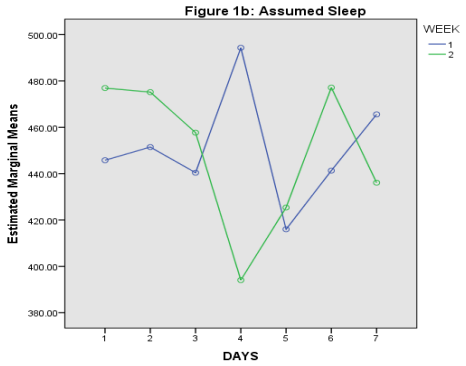
For all three conditions during low workload the pattern was similar with sleep gradually increasing throughout the week for low stress workload, with a peak in sleep on day 4 (Thursday) and a dramatic drop in sleep on day 5 (Friday), this could be due to social activity. Sleep restores to averages similar to the beginning of the week on day 6 (Saturday) and day 7 (Sunday).

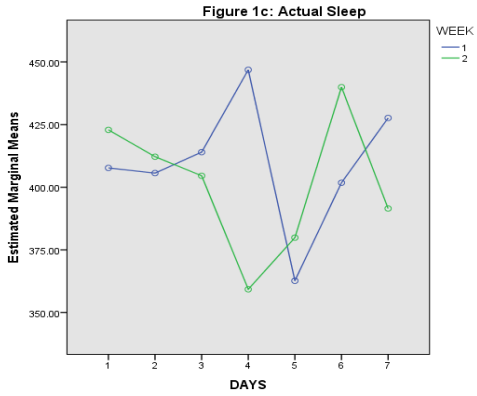
During high workload sleep is average at the beginning of the week and declines gradually, with a dramatic drop on day 4 (Thursday); this makes sense given that the participants were to sit an exam the following day. Consistent with this sleep peaks on Saturday and starts to decline again on Sunday in anticipation of the week to come.

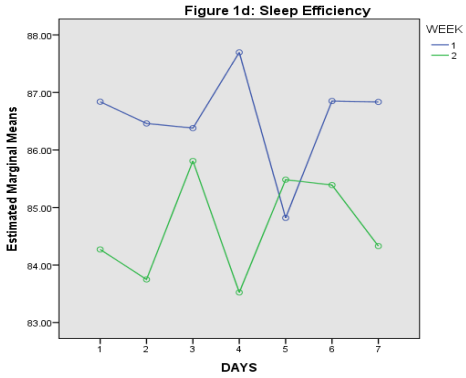
The main effects for Rise Times are significant between weeks suggesting the average wake times are different for weeks one (low workload) and two (high workload). Students appear to be getting up earlier every day in the high workload condition and later in the low workload condition; this suggests they are taking their work commitments seriously. On average students are losing 30 minutes sleep per day (see figure 1e). There are no significant effects for days or interaction suggesting the days follow the same pattern across the week, with rise times shifting for each day, so clear evidence that the timing of an exam or additional assessment has a detrimental effect on sleep.

Figures 5.1(a-d) Interaction Plots: Time in Bed, Assumed Sleep Actual Sleep and Sleep Efficiency, for each day of the week.









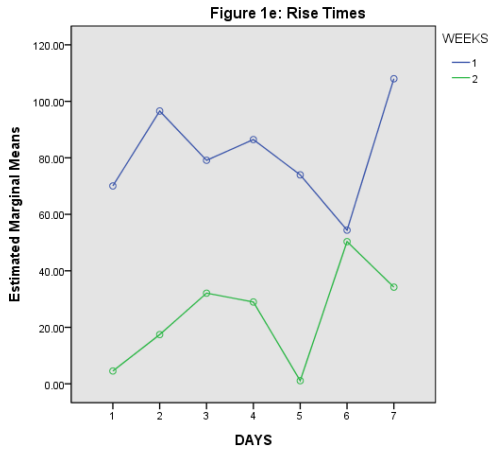


Table 5.3: Means, Standard Deviations and Repeated Measures ANOVA Sleep Quality, Mood and Alertness (Subjective) for High and Low Workload Weeks

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	WEEK(H/L)	Days(H/L)	Interaction
Mean SQL	4.22	3.78	3.83	4.69	3.88	4.21	4.37			
SD SQL	1.45	1.49	1.55	1.31	1.73	1.51	1.27			
								ns	f(6)=2.342*	f(6)=2.734*
Mean SQH	4.27	4.07	3.88	3.66	3.52	4.48	4. 01			
SD SQH	1.33	1.60	1.57	1.62	1.70	1.45	1.52			
Mean ML	4.41	3.98	4.11	4.66	3.83	4.56	4.42			
SD ML	1.53	1.80	1.55	1.38	1.57	1.40	1.44			
								ns	ns	f(6)=2.225*
Mean MH	4.56	4.08	3.91	3.59	3.95	4.62	4.09			
SD MH	1.25	1.68	1.80	1.99	1.65	1.53	1.57			
Mean AL	3.98	3.56	3.73	4.44	3.55	4.15	4.15			
SD AL	1.71	1.78	1.80	1.51	1.86	1.68	1.54			
								ns	ns	ns
Mean AH	4.23	3.93	3.88	3.73	3.79	4.28	3.72			
SD AH	1.36	1.85	1.87	1.86	1.74	1.58	1.74			

*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed) *1p<.05 (one-tailed) Key: SQ = Sleep Quality L = Low Workload H = High Workload M = Mood A= Alertness

Sleep Quality Mood and Alertness (Subjective)

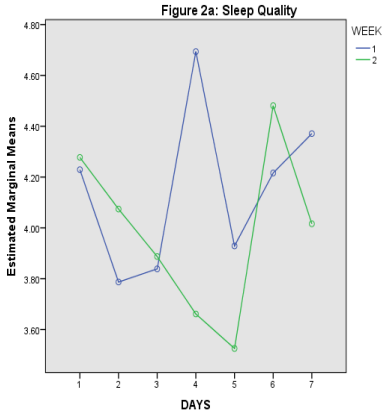
For sleep quality repeated measures ANOVAs revealed that the main effect between weeks was not significant, illustrating there is no difference between the high workload week and the low workload week in terms of average sleep quality. There was however, a significant effect for days demonstrating the pattern of sleep quality shifts daily ($F(6)=2.342$, $p=.03$); there are also significant interaction effects ($f(6)=2.734$, $p=.014$) illustrating the days follow a systematic pattern with the main differences showing for Thursday (see figure 2a).

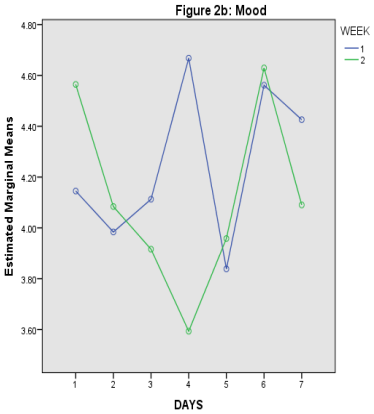
Mood follows a similar pattern except there are no significant effects showing for weeks or days, however there is a significant interaction effect ($f(6)=2.225$, $p=.04$), again mood follows a systematic pattern throughout the week, with the main difference showing as Thursday (see figure 2b).

There are no significant effects for level of alertness.

Means illustrate that sleep quality drops around the critical working period that is Thursday of the high workload week. The trend is repeated for mood which plummets on Thursday in week 2. In addition to mean differences, there is also wider variation around this point for both sleep quality and mood. Level of alertness however does not alter, possible due to an increased level of arousal around exam time. The participants sleep quality, mood and level of alertness (although not significantly for sleep quality - figure 2a) appears impaired during the high workload condition, compared to the low workload condition.

Figures 5.2(a-c) Interaction Plots: Sleep Quality and Mood: Low Workload (week 1) vs. High Workload (week2)





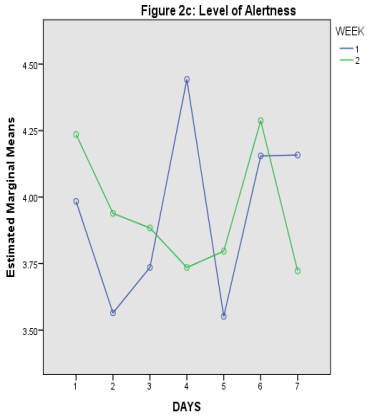


Table 5.4: Repeated Measures ANOVA on Percentage Change Scores for Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency (Actiwatch)

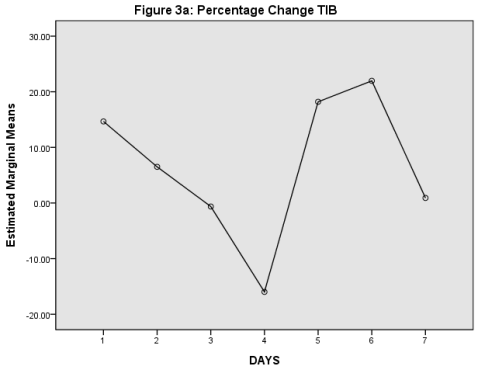
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Days(H/L)	PC (Mean Diff)
Mean TIB	14.66	6.50	-.635	-15.98	18.20	21.96	.911	F(6)=2.930**	Thurs/Mon (30.65)* Thurs/Tues (22.48)*[1] Thurs/Sat (37.95)*
SD TIB	36.44	24.69	28.16	30.12	79.38	51.84	38.22		
Mean Ass	16.19	6.38	56.45	-16.82	17.50	15.85	-.448	ns	Tues/Thurs (23.21), p<.05(one-tailed)
SD Ass	48.51	24.05	296.59	34.56	80.30	45.52	40.24		
Mean Act	14.45	2.68	.132	-16.31	20.44	16.64	-.967	F(3.4),=2.291*[1]	ns
SD Act	55.94	26.45	21.82	32.57	83.89	45.42	44.22		
Mean SE (%)	-2.51	-3.03	-.464	-4.27	1.69	6.54	-1.98	ns	ns
SD SE (%)	17.88	14.49	7.79	18.30	14.40	60.84	9.84		

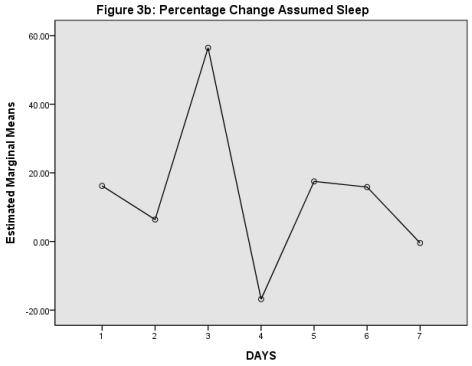
*p<.05 level (two-tailed) **p<.01 level (two-tailed) ***p<.001 (two-tailed) *1p<.05 (one-tailed) PC = Percentage Change Key – see table 1

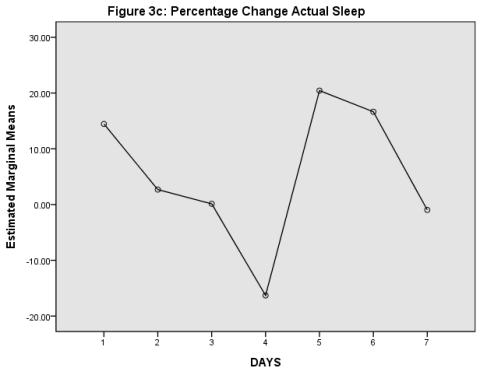
Percentage Change

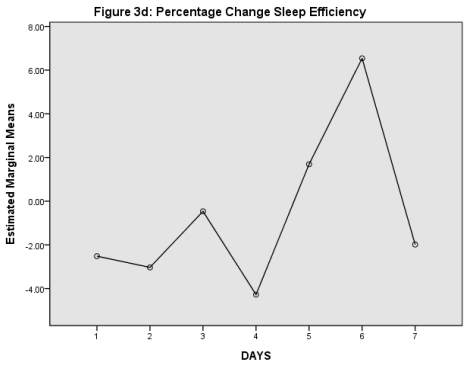
Table 5.4 shows results of a Repeated Measures ANOVA and indicates significant effects for time in bed Days between weeks one and two ($F(6)=2.293, p<.01$); also for Assumed Sleep and Actual Sleep on a one-tailed basis. Pairwise Comparison shows significant differences between Thursday and Monday, Tuesday and Saturday as would be expected. Figure 3a shows that students go to bed later on Thursday than all other days, once again demonstrating they may be cramming for their exam on Friday. Figure 3b shows students have less Assumed Sleep and figure 3c less Actual Sleep on Thursday compared to all other days, although unless otherwise stated these differences are non-significant; there is however, a clear trend. There are no significant effects for Sleep Efficiency.

Figure 5.3(a-d) Percentage Changes for Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency









Correlation Coefficients on Absolute Scores for Days (Low Workload and High Workload)

Table 5.5: Correlation Coefficients for Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency with AP (Module and GPA) for high and low workload weeks.

	OCC	EXP	CHD	SPORT	SUB A	PSYCHOP	DISS	GPA
THTIBL	-.354*							
FTIBL							.473**	
SATTIBL					.290.*$_1$			
AV TIBL					.346*		.336*	
FASSL							.476**	
SATASSL					.307* $_1$			
AVASSL							.344*	
FACTL							.449**	
SATACTL			-.325*		.305*$_1$			
SUNACTL				-.323*			.332*	
WSEL					.343**			
SATSEL							-.417*	-.386*
SUNSEL				-.441**	-.323*			
MTIBH			-.359*					
THTIBH			.293*$_1$			.309*		
MASSH			-.296*$_1$					
TH ASSH			.308*$_1$			.325*		
TH ACTH			.287*$_1$			.316*		
TSEH	.315*	.339*					.364*	.283*$_1$
SATSEH	-.457**							

1 = one-tailed at < .06. *M=Monday; T = Tuesday; W=Wednesday; TH=Thursday; F=Friday; SAT=Saturday; SUN=Sunday; AV=Average; TIB=Time in Bed; ASS=Assumed Sleep; Act=Actual Sleep; SE = Sleep Efficiency; L=Low workload; H = HWL. One-tailed p values in small font. *Occ Psy= Occupational Psychology; CHD= Childhood Disorders; Sport = Sports Psychology; SA=Substance Abuse; Psychop=Psychopathology; DISS=Dissertation ; GPA = Grade Point Average

To note, for all correlation tables recurrent patterns are in columns and only days with significance and significant correlations are presented in all tables. Table 5.5 shows the associations between sleep and academic performance illustrating that sleep in low workload condition is mainly associated with dissertation marks. This suggests that good quality sleep during low workload contributes to the end product in terms of marks; this is fitting as the dissertation is an on-going project. Interestingly, the effects for the dissertation module disappear during the high workload condition, except for Tuesday sleep efficiency illustrating that when efficient sleep is achieved this positively relates to dissertation mark. As the dissertation module is the marker of this study for an on-going piece of work demanding consistent attention, it is encouraging to see such associations with dissertation results, even though the effects may disappear for a short time during high workload, where attention is required elsewhere. Saturday and Sunday are negatively associated with academic performance as might be expected for weekend sleep. Consistent with the repeated measures ANOVA Students appear to be capitalising on sleep on Tuesday in the high workload condition as expected. Overall, students' time in bed,

assumed, actual and sleep efficiency seems to be more regular and associated with academic performance in the low workload condition, suggesting that this is where they capitalise on sleep; whereas in the high workload condition it appears students are losing sleep and this could be having a negative impact upon their performance.

Table 5.6: Correlation Coefficients for Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency with the FFM for high and low workload weeks

	Open	Agree	ES	CONSC	EXTRA
THTIBL	.326*				
TASSL			.343*		
TACTL			-.316*		
AVACTL					.295*
TTIBH					.361*
WTIBH				.366*	
THTIBH	.388*	.405*	.403*		
FTIBH				.345*	
AVTIBH				.307*	.308*
TASSH	.386*				
WASSH				.318*	
THASSH		.394*	.441**	.318*	
FASSH					
SUNASSH	.301*				
AVASSH	.278*$_1$				
TACTH	.280*$_1$				.513**
WACTH				.444**	
THACTH	.350*	.372*	.408*		
FACTH	.338*			.312*	.353*
AVACTH					.459**
MSEL	.426**	.393*			
WSEL	.272*$_1$	.460**			
THSEL	.312*	.419**	.367*		.419**
FSEL	.344*		-.308*		
AVSEL	.341*	.454**			
MSEH		.314*			.283*$_1$
TSEH	.350*	.365*			.343*
WSEH	.434**	.473**		.309*	.324*
FSEH					.419**
SATSEH				-.381**	
AVSEH		.325*			.377*

*Key – Table 5 1 = one-tailed at < .06.

Table 5.6 illustrates the associations between sleep and the five factors of the Five Factor Model. For students with higher openness scores time in bed and efficiency is moderate during low and high workload weeks but sleep is most efficient during the low workload condition, particularly for Monday, Thursday, Friday and Average Sleep Efficiency (*rs*=.312-426, *ps*.01-.05). Open students also have efficient sleep on Tuesday and Wednesday of the high workload week, suggesting this is when they capitalise on sleep

lost on the other days. Agreeableness is associated to both low and high states, although the associations are a little stronger in the low workload condition, suggesting their sleep may be compromised when workload is high, but only marginally.

Participants scoring highly on extraversion sleep well during the high workload condition and low workload condition suggesting that their sleep is not adversely affected by high stress levels. Extraversion however, is not related with time in bed, assumed or actual sleep on Thursday, however their sleep appears to be efficient for the time that they are asleep suggesting they are not experiencing worry in relation to the exam. In line with the findings of the repeated measures ANOVA and hypothesis 1, this may be because extraverted students are cramming the night before the exam. Extraverted individuals appear to be capitalising on sleep early (Tuesday) in the week and following the exam (Friday).

The trend for conscientious students demonstrates better sleep duration during periods of high stress; this might be expected as conscientious students may ensure they go to bed early and get an adequate amount of sleep before an exam or coursework deadline. However, sleep efficiency high does not follow this pattern, suggesting despite going to bed early and sleeping for an adequate duration, they do not sleep very well, possible due to underlying stresses about the pending exam. This trend is repeated for emotionally stable students

In the high workload condition time in bed and actual sleep are associated with students who are open to experience, agreeable and emotionally stable. This is as expected, particularly as agreeable students are more likely to go to bed early and sleep before an exam as this is socially recommended, and emotionally stable students may be more relaxed and not worried about the pending exam. In contrast time in bed, assumed sleep and actual sleep are not associated with students who are extravert. Whereas conscientious students are on average going to bed earlier, they do not appear to be sleeping very efficiently for either the low workload week or the high workload week (this is consistent with the idea that they are unable to ‘switch off’). Despite not sleeping efficiently the majority of the time, sleep efficiency correlations do suggest that conscientious students are capitalising on Sleep on Wednesday evening with associations showing for time in bed, assumed sleep, actual sleep and sleep efficiency. Individuals with other personality traits are sleeping efficiently on the night before the exam, even if their sleep duration is short,

possibly due to cramming. In conclusion, personality traits may predispose individuals to experience sleep in particular patterns that impact on low and high workload conditions systematically as presented in table 6.

Table 5.7: Correlation Coefficients for time in bed, Assumed Sleep, Actual Sleep and Sleep Efficiency with SE, ASE, ACS and TA

	GSE	ASE	ACS	TA(T)	TA(Ten)	TA(BS)	TA(W)	TA(TIRT)
SATTIBL		.334*						
WASSL				.371*	.356*		.302*	
SATASSL		.329*						
SATACTL		.319*						
AVACTL		.286*1						
MTIBH		-.317*						
THTIBH	.367*							
FTIBH		.270*1						
MASSH		-.360*						
THASSH	.316*							
FASSH	.305*	.305*						
MACTH				.334*	.339*			
THACTH	.383*							
FACTH	.338*	.338*			-.288*1			
SATACTH		.275*1						
MSEL	.380*	.377*						
TSEL		.324*	.318*					
WSEL			.269*1					
THSEL	.452**	.564**		-.395*	-.369*	-.385*	-.290*	
SUNSEL						-.303*		
AVSEL	.354*							
WSEH	.500**		.274*1			-.338*		
FSEH		.411**		-.422**	-.332*		-.355*	
SATSEH		.390*			.303*			
SUNSEH		.290*1	.290*1					-.341*
AVSEH		.303*						

*Key – Table 5 and list of abbreviations 1 = one-tailed at < .06.

Table 5.7 demonstrates that in the low workload condition individuals with academic self-efficacy appear to sustain their efforts all week then capitalise on sleep on Saturday. This pattern shifts somewhat in the high workload week with students capitalising on Fridays. During the high workload week students only appear to have efficient sleep following the exam, suggesting that they are sustaining efforts or revising on the days leading up to the exam. Students with general self-efficacy are going to bed earlier and sleeping more minutes on Thursday and Friday of the high workload condition, with their most efficient sleep on Wednesday, suggesting they are in control and relaxed about the exam. Interestingly, students with test anxiety appear to be sleeping less on Friday following the

exam, this suggests a ruminative effect, whereby students may be ruminating about how well they fared on the exam, causing worry and tension.

Table 5.8: Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency with Emotional Intelligence

	TEIQ	AES	TMMS
WTIBL	.341*		
TASSL	.375*		
MACTL			.295*
THTIBH	.338*		.420**
FTIBH	.323*	.313*	.326*
AVTIBH	.275*$_{1}$		.320*
THASSH	.305*	.320*	.433**
FASSH	.362*	.333*	.360*
AVASSH			.316*
TACTH		.325*	
WACTH		.277*$_{1}$	.315*
THACTH	.407*		.403*
FACTH	.416**	.372*	.409*
AV ACT H	.322*	.280*$_{1}$	.375*
WSEL	.349*	.435**	.285*$_{1}$
THSEL	.564**	.418**	.553**
SUNSEL			
AVSEL		.282*$_{1}$	
TSEH	.348*	.472**	.326*
WSEH	.316*	.478**	.406*
FSEH		.277*$_{1}$	.338*
AVSEH		.349*	.292$_{.053}$

Key – see table 5 and list of abbreviations

During the high workload week, emotionally intelligent students are on average sleeping well (*rs* =.320; .316; .375, ps<.05) for assessing emotions scale with average time in bed, assumed sleep and actual sleep respectively; with average sleep efficiency showing significance for the Assessing Emotions Scale on a one-tailed basis (r=.292, p=.053) and Trait Meta Mood Scale (r=.349, p<.05). The Trait Emotional Intelligence Questionnaire is also showing significance for Average Actual Sleep. This demonstrates that the emotional intelligence measures tap a similar construct but are also independent of one another. Students are going to bed early and sleeping more minutes the night before the exam (Thursday) (*rs* =.323; .305; 407, ps<.05) for the Trait Emotional Intelligence Questionnaire with Thursday time in bed, assumed and actual sleep respectively; their sleep efficiency on Thursday however, is not significant indicating they might not be sleeping as well as they could be, which could indicate a normal level of pre-exam stress. They are going to bed early, sleeping an adequate number of minutes and sleeping efficiently the night of the

exam (Friday), suggesting they restore their sleep and are able to manage their emotions and consequently not lose sleep worrying about how they have performed in the exam. On average, emotionally intelligent students go to bed earlier and sleep a longer duration during high workload than do less emotionally intelligent students. These conclusions are corroborated by recurrent patterns across the three measures. Again it is clear, that like personality traits, emotional intelligence scores appear to predispose individuals to experience sleep in particular ways and each of the three emotional intelligence measures appears to be operational in relation to sleep.

Table 5.9: Correlation Coefficients for Time in Bed, Assumed Sleep, Actual Sleep and Sleep Efficiency with Wellbeing

	GHQ12	LOT	HSE	HOPE	PA(N)	PA(P)	SWL	ANX	DEP	HA(T)
MTIBL			.271*$_1$	.322*						
WTIBL				-.328*						
THTIBL								.280*$_1$		.282*$_1$
SUNTIBL						-.325*				
MASSL				.374*			.318*			
SUNASSL			.381*							
MACTL			.301*	.466**		.272*$_1$	.355*		-.337*	-.308*
TTIBH	-.314*	.365*							-.301*	
WTIBH					-.317*					
THTIBH	-.315*			.309*			.287*$_1$		-.296*	
FTIBH	-.314*	.510**		.297*		.378*	.376*			
SUNTIBH									-.331*	
AVTIBH	-.351*	.481**								
TASSH	-.326*	.376*							-.302*	
THASSH	-.303*			.293*$_1$			.308**		-.316*	
FASSH	-.315*	.552**		.301**		.395*	.372*			
SUNASSH									-.329*	
AVASSH	-.288*$_1$	.384*								
TACTH	-.382*	.418**		.278*$_1$			.313*		-.384*	-298*
THACTH	-.338*	.612**					.290*$_1$			
FACTH	-.385*			.371*		.482**	.414**		-.350*	
SUNACTH									-.369*	
AVACTH	-.289*	.427**					.315*		-.346*	
MSEL				.468**		.477**	.357*		-.477**	-.300*
TSEL						.326*				
WSEL			.411**	.314*		.373*	.444**		-.355*	-.334*
THSEL	-.676**	.484**	.345*	.467**		.545**	.343*	-.407*	-.658**	-.578**
FSEL						.306*				
SATSEL		.311*								
AVSEL	-.365*	.347*		.362*		.482**			-.429**	-.299*
TSEH						.302*	.418**		-.320*	
WSEH				.463**		.527**	.279*$_1$		-.330*	
THSEH							.309*			
FSEH	-.317*	.470**				.414**			-.392*	
SUNSEH							.389*			
AVSEH						.298*	.400*		-.366*	

Key – see table 5 and list of abbreviations

Table 5.9 demonstrates the association between sleep and the wellbeing variables. During low workload week students with health self-Eefficacy, positive affect, hope and satisfaction with life appear to be going to bed early and having better actual and assumed sleep on Monday; These students and those that have scored high on General Health Questionnaire, optimism and low on the Hospital Anxiety and Depression Inventory, appear to have slept more efficiently on average and on Monday, Wednesday and Thursday of the low workload week. During the high workload week students with good general mental health (General Health Questionnaire) and optimism (Life Orientation Test) went to bed earlier and slept more minutes on average and in particular on Tuesday, Thursday and Friday, with good sleep efficiency only on Friday. This suggests that even individuals with high scores on the Life Orientation Test experience some stress leading up to an exam, whilst this may not be conscious and they do not appear to spend time actively worrying. Hopeful individuals appear to be going to bed early on Thursday and Friday but did not have sufficient actual minutes of sleep on Thursday, nor was their sleep efficient; hopeful students slept most efficiently on Wednesday. Students with positive affect slept more minutes on Friday suggesting they are restoring their sleep; although they may not spend a large number of minutes in bed or asleep on other days their sleep efficiency for all days is good, suggesting they slept well for the time they were asleep. The exception to this is on the weekend (Saturday and Sunday) and Thursday (the night before the exam). Those with higher scores on the Satisfaction with Life scale slept most efficiently on Tuesday, Thursday, Sunday, and on average. Finally, individuals low on depression went to bed early and had good actual sleep in terms of minutes on Tuesday, Thursday and Sunday but their sleep efficiency appears to have been affected on Thursday, the night before the exam.

It would appear most students feel some pressure or stress leading up to an exam, however individuals with better wellbeing go to bed earlier and spend more minutes in bed. This suggests less active worrying and so higher mental wellbeing may provide some defence against stress; thus these individuals are able to go to bed earlier and sleep longer durations, possibly enabling students to perform better academically and function better during the day.

The associations between sleep during the low work load condition and the high workload condition are in the expected direction and do not overlap, illustrating independence. The inter-correlations within the Five Factor Model are generally low; this supports the

assumption that the factors are orthogonal and indicates there is no problem with multicollinearity (Tabachnick & Fidell, 2007).

Regression Analyses

The variables chosen for each of the three multiple regression models presented were based on the patterns of associations observed in the zero order correlations, and this principle is also applied in subsequent regressions.

Table 5.10: Three Multiple Regression Analyses to show Average Sleep regressed on self-reported Individual Differences

	AVACTSL(H) Model 1			AVSE(L) Model 2			AVSE(H) Model 3		
	B	SE	β	B	SE	β	B	SE	β
EXTRA	3.02	1.80	.322*	.100	.134	.138	.224	.190	.222
TMMS	.748	1.07	.155						
LOT	2.57	4.43	.144						
AGREE				.280	.191	.270			
PA				.190	.143	.271			
AES							.056	.076	.144
SWL							.289	.243	.236
F	(3,28) = 3.406*			(3,28) = 4.079*			(3,28) = 2.766*1t		
AdjR² =	.19			.23			.15		

****p<.001 **p<.01 *p<.05*

Table 5.10 summarises three multiple regression analyses with average Actual Sleep (high workload) regressed on Extraversion, Trait Meta Mood Scale (emotional intelligence) and the Life Orientation Test. Average sleep efficiency (low workload) on extraversion, agreeableness and positive affect and average sleep efficiency (high workload) on extraversion, Assessing Emotions Scale (emotional intelligence) and satisfaction with life. All three models were statistically significant (model 3 on a one-tailed basis) as shown by the F-values and significant F change ($p < .05$), and accounted for 19, 23, and 15% of the variance as shown by the adjusted R square. It can be seen in the first model that most of the variance is explained by extraversion. Models one and two are significant and model three should be interpreted with caution as this is significant on a one-tailed basis and would be forfeited when corrected for type 1 errors. It can be seen by the inferential test that Extraversion accounts for unique variance on average actual sleep (high workload) and

has the strongest beta weights in the cluster of three. Agreeableness appears to account for the most variance on average sleep efficiency (low workload) and satisfaction with life on Average Sleep Efficiency (high workload), although as no individual beta weight accounted for unique significance, the combination of variables produced substantial shared effect sizes at 23 % and 15%.

Table 5.11: Hierarchical Regression for Average Sleep Efficiency (low workload condition)

		B	SE	B	F	FChange	Adj. R^2
1	EXTRA	.265	.123	.367*	F(1,30)=4.659	4.659*	.106
2	EXTRA	.178	.122	.246	F(2,29)=5.104	4.938*	.209
	AGREE	.389	.175	.375*			
3	EXTRA	.100	.134	.138	F(3,(28)=4.079	1.762	.230
	AGREE	.280	.191	.270			
	PANAS	.190	.143	.271			

Table 5.11 shows the results of a hierarchical regression analysis on average sleep efficiency (low workload) demonstrating that models 1 and 2 are significant; however, unique significance is lost in model 3 explicating that positive and negative affect add no significant incremental variance. Model 3 does however maintain shared significance, adding only 2% incremental validity (Adj. R^2) although the F-change is not significant. The Five Factor Model still accounts for 21% on sleep efficiency with extraversion and agreeableness as unique and shared predictors (Extraversion is marginally subsumed in model 2).

Table 5.12: Hierarchical Regression for Average Sleep Efficiency (high workload condition)

		B	SE	B	F	FChange	Adj. R^2
1	EXTRA	.381	.171	.377	F(1,30)=4.979	4.979**	.114
2	EXTRA	.286	.184	.283	F(2,29)=3.396	1.698	.134
	AES	.092	.071	.237			

Table 5.12 displays the results of a hierarchical regression analysis on average sleep efficiency (high workload). Model 1 is significant but model 2 is not. Extraversion accounts for 11% of the variance in average sleep efficiency; Assessing Emotions Scale adds 2% when added to the model but this is not significant. Interestingly, extraversion remains an effective contributor from the previous table but agreeableness drops out. However, Assessing Emotions Scale (although non-significant) comes into play. The three significant variables are arguably associated with emotionality.

Hierarchical regression analysis was also conducted for average actual sleep (high workload), however this was not included as it showed little incremental validity; although each individual model was significant and the model was significant overall.

The Pittsburgh Sleep Quality Index

Table 5.13: Means, Standard Deviations, Skewness and Kurtosis for the subscales of the Pittsburgh Sleep Quality Index Scores

	Duration	Disturbance	Latency	Dysfunction	HSE	OSQ	Medicine	Total Sleep
Mean TIB	.1875	2.1875	.4063	2.1875	.2813	.8125	.2500	6.3125
SD	.39656	.47093	.71208	.59229	.52267	.64446	.76200	1.63505
Skewness	1.681	.633	1.496	-.054	1.721	.187	3.266	.310
Kurtosis	.877	.721	.806	-.160	2.324	-.514	10.056	-.093

HSE = Habitual Sleep Efficiency OSQ = Overall Sleep Quality

With 0 representing very good and 3 representing very poor, perceived sleep duration, sleep latency, habitual sleep efficiency and overall sleep quality appear to be toward very good. Use of medication is also very good indicating the majority students in this study do not use medication to help them sleep. Despite this, sleep disturbance and daytime dysfunction are fairly poor, as a consequence Total Sleep is also poor (below 5 = good total sleep; above 5 = poor total sleep). In accordance with the hypotheses, it would be expected that good sleep duration and sleep quality would be positively related to good academic performance and wellbeing, to positive personality traits and to higher emotional intelligence. Lower sleep duration, quality and total sleep would be negatively associated or the effects negligible. The following one-tailed correlations will explore these associations.

Table 5.14: Correlation Coefficients for PSQI with Academic Performance, Personality, GSE, ASE, TA, Emotional Intelligence and Wellbeing

	DURATION	DISTURB	LATENCY	DYSFUN	HSE	OSQ	MED	TOTAL
Occ Psy		-.443**	.343*	-.370*				
CHD				-.482**				
Sports		-.343*		-.344*		-.374*		-.471**
SA								-.389*
Psycho				-.438**				
DISS								
GPA				-.345*				-.322
OPEN	.379*	-.331*	-.333*		-.329*			-.494*
AGREE	.326*							
ES		-.298*					-.333	-.379*
CONSC	.366*			-.320*				
EXTRA								-.372*
GSE	.434**		-.567**					-.344*
ASE								-.328*
TA(T)								
TA(Ten)	-.341*				.338*			
TA(BS)	-.485**							
TA(W)							.313*	
AES	.353*							
TEIQ	.372*	-.389*	-.321*					-.483**
TMMS		-.355*		-.298*				-.440**
GHQ-12	-.440**		.395*					.305*
LOT								-.322*
HSE		-.618**				-.355*		-.591**
HOPE	.299*	-.421**	-.356*					-.447**
PAN(P)	.467**		-.436**		-.323*			-.348*
PAN(N)			.343*					.450**
SWL			-.315*	-.351*		-.308*		-.407*
Anxiety	-.327*				.413**			.328*
Depression	-.379*				.291*[1]		.333*	.440**
HADS(T)					.405*		.325*	.423**

*Occ Psy= Occupational Psychology; CHD= Childhood Disorders; Sports = Sports Psychology; SA=Substance Abuse; Psycho=Psychopathology ; DISS=Dissertation ; GPA = Grade Point Average.

Pittsburgh Sleep Index and Academic Performance

As expected sleep disturbance and daily dysfunction has a negative association with academic performance, with dysfunction showing associations with more modules; importantly though, both disturbance and dysfunction are negatively related to Occupational Psychology (the exam sat on Friday of the High Workload Week). Duration and health self-efficacy has no impact upon academic performance perhaps as both were adequate. As expected total sleep (total sleep was poor) is negatively associated with academic performance and most importantly with Grade Point Average. Total sleep does not impact upon the dissertation module, this is likely because it is an on-going project and so unaffected by variable sleep patterns.

Pittsburgh Sleep Index and Personality

Sleep duration is positively associated with conscientiousness, agreeableness and openness, as might be expected with conscientious and agreeable students attaining more sleep on average – this is in accordance with absolute scores during low workload. Sleep disturbance is negatively associated with openness and emotional stability (as expected) but has negligible effects on the other personality variables. Daytime dysfunction is negatively associated with conscientiousness (again, as predicted) and Total Sleep is negatively associated with openness, emotional stability and extraversion.

Pittsburgh Sleep Index and general self-efficacy, academic self-efficacy and test anxiety

As predicted good sleep duration is positively associated with general self-efficacy and negatively to test anxiety (Tension and Bodily Symptoms). Total sleep is negatively related to both general and academic self-efficacy as predicted.

Pittsburgh Sleep Index and Emotional Intelligence

In the predicted direction good sleep duration is positively associated with emotional intelligence and sleep disturbance, daily dysfunction and total sleep is negatively associated.

Pittsburgh Sleep Index and Wellbeing

In the expected direction sleep duration is positively associated with hope and positive affect and negatively associated with general health questionnaire-12, anxiety and depression. Sleep disturbance, sleep latency and daily dysfunction are also in the expected

direction. Total sleep is associated with all the wellbeing variables in the predicted direction. This suggests that overall sleep is associated with the wellbeing of students.

Table 5.15: Multiple Regression Analyses for the Self-Report Measures on Sleep Duration, Latency, Disturbance, Daytime Dysfunction and Total Sleep

	DURATION			LATENCY			DISTURB			DYSFUNCTION			TOTAL		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
OCC PSY							-.049	.027	-.294	-.031	.040	-.148			
CHD										-.029	.016	-.357*[1]			
SWL										-.025	.018	-.233			
SPORT PSY													-.100	.041	-.342*
OPEN													-.082	.031	-.369*
CONSC	.009	.014	.143												
GSE	.008	.012	.127	-.096	.035	-.724*									
BS	-.018	.010	-.323*[1]												
TEIQ							.003	.006	.138						
TMMS							.000	.012	-.105						
GHQ	-.008	.016	-.109	.022	.025	.161									
HOPE				.022	.018	.306	.011	.016	-.210						
HSE							.038	.015	-.485*				-.102	.038	-.388*
PA	.007	.013	.122												
F	(5,26) = 3.010* .028			(3,28) = 5.303* * .005			(5,23) = 3.948** .01			(3,25) = 3.675* .025			(3,25) = 10.578** .01		
Adj. R =	.114			.272			.345			.223			.506		

****p<.001 **p<.01 *p<.05 *[1]=one tailed.*

Table 5.15 demonstrates that bodily symptoms contributes the most variance to duration, indicating that individuals who do not get enough sleep are more likely to experience bodily symptoms in relation to test anxiety. Students who have better latency scores have higher general self-efficacy. Students who have disturbed sleep achieve poorer academic performance (in relation to Occupational Psychology- the Friday exam of the high workload week; although this is non-significant in the regression analysis). Students who have higher emotional intelligence, more hope and more health self-efficacy experience less sleep disturbance, although health self-efficacy is the only significant variable when entered into the regression analysis. Daytime dysfunction predicts poor academic performance (particularly the Childhood Disorders module). Individuals who are open to experience achieve better total sleep, better academic performance and have better health self-efficacy. Total sleep is showing as negative as the total sleep of students overall, was poor.

Table 5.16: Hierarchical Regression for Average Sleep Efficiency (low workload condition)

	B	SE	B	F	FChange	Adj. R^2
1 OPEN	-.106	.038	-.477*	F(1,27)=7.966**	7.966**	.199
2 OPEN	-.079	.033	-.356*	F(1,26)=10.770***	10.709**	.453
HSE	-.130	.040	-.490**			
3 OPEN	-.082	.031	-.369*	F(1,25)=10.576***	6.025*	.559
HSE	-.102	.038	-.385*			
SPORTPSY	-.100	.041	.342*			

****p<.001 **p<.01 *p<.05*

Table 5.16 demonstrates that each model is significant. Each variable is significant and the F change in each model is significant illustrating that each variable and each model has incremental validity whilst controlling for previous factors. Of the personality variables openness accounts for 20% of the variance on total sleep, whilst health self-efficacy with openness accounts for 45% and the academic performance indicator (in this case Sports Psychology) account for 56% adding 10% incremental variance to openness and health self-efficacy. There does not appear to be a problem with multicollinearity as the tolerance level is above the recommended .3 falling within.9 range and the standard errors are small (Tabachnick & Fidell, 2007).

Table 5.17: Hierarchical Regression for Average Sleep Efficiency (low workload condition)

		B	SE	B	F	FChange	Adj. R^2
1	SWL	-.036	.019	-.340	F(1,27)=3.534*$_1$	3.534*$_1$	.116
2	SWL	-.025	.018	-.233	F(1,25)=3.657*	3.534*	.306
	OCC	-.031	.040	-.148			
	CHD	-.029	.016	-.357*$_1$			

****p<.001 **p<.01 *p <.05*

Table 5.17 demonstrates that both models are significant on a one-tailed basis. Satisfaction with life approaches significance (.07) on a two-tailed test; however most of the incremental variance is coming from academic performance, particularly Childhood Disorders.

Table 5.18: Hierarchical Regression for Average Sleep Efficiency (low workload condition)

		B	SE	B	F	FChange	Adj. R^2
1	CONSC	.023	.011	.366*	F(1,30)=4.360*	4.630*	.105
2	CONSC	.013	.012	.212	F(1,29)=4.173*	3.353*$_1$	.170
	GSE	.025	.014	.337*$_1$			
3	CONSC	.011	.011	.174	F(1,28)=5.006**	5.404*	.279
	GSE	.018	.013	.241			
	BS	-.020	.009	-.374*			
4	CONSC	-.008	.012	-.127	F(2,26)=3.010*	.359	.245
	GSE	-.010	.017	-.135			
	BS	-.018	.010	-.323*$_1$			
	GHQ	-.008	.016	-.109			
	PANAS	.007	.013	.122			

****p<.001 **p<.01 *p <.05*

Table 5.18 illustrates that Conscientiousness accounts for 11% of the variance in sleep efficiency but general self-efficacy is adding 6% in model 2. In model 3 bodily symptoms is the only significant factor but combined variance increases by 11% from 17 to 28%. The

first three models are significant; however the addition of the wellbeing variables reduces the effect size and is thereafter redundant.

From all of the results presented in this chapter, a number are significant at the $p<.05$ level or on a one-tailed test. These should be treated with due caution to allow for type 1 errors, but this should be balanced against the small sample and the good non-trivial effect sizes represented in the Adj R^2 (especially given that this is a downward adjustment from the R^2).

5.4 Discussion

Research has considered the effects of sleep on academic performance and wellbeing and investigated the association of personality and emotional intelligence variables; however, this is the first study to bring all these variables together, using objective measures for both sleep and academic performance, therefore avoiding the problem of shared method variance (Tabachnick & Fidell, 2007). This study is also supplemented by the measurement of self-reported sleep. Consistent with H_1, the findings revealed that students slept an average of 6.8hours, this is less than recommended for this age group but similar to the findings of Lund et al., (2010); Taylor and Bramoweth, (2010) and Brick, Seely and Palermo (2010) for students; it is also similar to respondents in an American sleep poll (NSF, 2005) which reported adults aged 18-49 slept 6 hours 45 minutes on average. Therefore sleep duration was less than recommended but as expected for students, making these students a vulnerable group to the consequences of poor sleep.

High academic workload was associated with irregular sleep patterns and a significant loss of sleep the night before an exam (H_2/H_5). Although average Time in Bed, Assumed Sleep and Actual Sleep do not differ overall when assessed using absolute scores, when altered to percentage change, differences between these measures were evident. Sleep efficiency is consistently poorer in the high workload compared to low workload condition and percentage change analysis reveals a significant difference between average sleep duration in the high workload week compared with low workload, with students losing approximately 60 minutes in the former. This resulted in a different pattern across the days of the week, with significant sleep loss occurring on Thursday (the night before the exam). This is in accordance with H_4 and corroborates research by Pilcher and Walters, (1997); Banitt, (2002); Doghramji, (2008) who reported sleep loss the night before an exam and Killgore, Estrada, Wildzunas and Balkin (2008),who reported sleep loss two nights before an exam (as measured by actiwatch); these studies suggest students lose sleep due to

cramming or stress. Consistent with the results of the current study, Thacher (2008) found that students who engaged in a single night of sleep deprivation went to bed on average 60 mins later than those who did not; this sleep deprivation was significantly associated with lower Grade Point Average.

In the current study how well students slept differed from low workload to high, indicating that during high workload, students did not sleep as well. Average wake times also shifted, showing that students were getting up on average 30 minutes earlier in the high workload condition. Although this may not seem a dramatic difference, this irregular sleep-wake pattern and loss of sleep can accumulate over the week resulting in mood changes, decreased wellbeing and impaired academic performance. This study revealed significant drops in time in bed, sleep duration and sleep efficiency the night before the exam and significant drops in subjective sleep quality and mood. This irregularity is consistent with research by Lund et al., (2010) who found that students demonstrated a disturbing sleep-wake irregularity akin to that in younger adolescents and Medeiros et al., (2001) and Gomes et al., (2011) who reported that irregularity of the sleep-wake cycle (and deprivation) was associated with decreased academic performance. Further irregularity was associated with poor quality sleep. Lund et al., (2010) and Sing and Wong (2010) showed that more than 50% of college students had poor sleep. In the current study students scored above 5 on the Pittsburgh Sleep Index, and this score is reminiscent of a clinical sleep disorder (Carney et al., 2006). This reported poor sleep is consistent with research by Orsal et al., (2012) who found that 75% of students reported poor sleep (as measured by the PSQI). Ahrberg et al., (2012) found that students experienced poorer sleep quality pre-exam (59%), compared to 29% during the semester and 8% of students post-exam. This is in line with the findings from the objective data in the current study, with students experiencing poorer sleep during high workload (exam time).

Academic performance

Academic performance is important for students' future careers as the lower this is the less likely they are to find well-paid employment or specialise in a career they would like (Taylor et al., 2011). Sleep variability correlations revealed that dissertation results are positively associated with average sleep in the low workload condition but not high workload; this is likely because the dissertation is an on-going project and so it may be temporarily subsumed during high workload when students are more likely to be

concentrating on the immediate coursework deadline or pending exam. With regard to subjective sleep (as measured by PSQI), as expected, Sleep Disturbance and Daily Dysfunction has a negative association with academic performance. Duration and health self-efficacy have no impact upon academic performance perhaps as both were considered adequate; it is interesting to note that although objective measures indicated poor duration, students rated their duration as adequate. This suggests that perception of sleep can be as important as objective sleep and is in accordance with Bahamman et al., (2012) who found that subjective feelings of obtaining adequate sleep was the only independent predictor of excellent academic performance, in a large group of medical students. It is important to note that students may not notice a decrease in their academic performance; with sleep deprivation students often rate their performance as better than it actually is (Pilcher & Walters, 1997); using objective performance measures as employed in the current study overcome this issue. As expected, Total Sleep (TST) was poor and was negatively associated with academic performance and most importantly with Grade Point Average (H_6). Total Sleep does not impact upon the Dissertation module, this is likely because it is an on-going project and so unaffected by variable sleep patterns. The research is in accordance with Medeiros (2001), who reported that 38.9% of students experienced poor sleep quality (subjective length and quality) during a study period and Lund et al., (2010) who reported 60% of students experienced poor sleep quality. Moreover, Taylor et al., (2011) found better sleep quality to be associated with better academic performance.

Personality (Five Factor Model)

In accordance with H_7, the current findings suggest that Extraversion and Openness to Experience provide some protection against the effects of loss of sleep in the high workload condition; both are associated with adequate average sleep during low and high workload weeks, suggesting sleep is not adversely affected by high workload stressors or worries about the exam. Extraversion shows predictive validity in relation to Average Actual Sleep and Average Sleep Efficiency in the high workload condition, whilst only accounting for a small percentage of the variance it is still of relevance and consistent with the findings of previous research (Soehner et al., 2007). Extraverted students do however lose sleep the night before the exam, suggesting they are engaging in all-night study (cramming). Agreeable students had good average sleep in the low workload condition but their average sleep during high workload was marginally affected. Multiple regression analysis revealed Agreeableness to be predictive of sleep in the low workload condition,

maintaining predictive validity even when controlling for Extraversion. Students who are conscientious and more emotionally stable have earlier time in bed and better sleep durations than individuals with the other personality traits. This is consistent with the current hypothesis and with research by Gomes et al., (2011); however sleep efficiency in the high workload condition is poor, suggesting some underlying stress about the exam. In line with research by Grey and Watson (2002), Conscientious students have earlier sleep-wake cycles contributing to better academic performance and Wolfeson and Carskadon (1998) who found that Conscientious students had earlier bedtimes and more total sleep time (TST) and consequently had higher grades. Indeed, despite mixed findings, in some studies earlier time in bed and more total sleep time have been consistently associated with better grades (Banitt, 2002; Eliasson et al., 2010; Trockel et al., 2000).

Self-efficacy and test Anxiety

General self-efficacy appears indicative of good average sleep in both high and low workload conditions, this is fitting as self-efficacy is linked to systematic regulation and control (Komarraju et al., 2013). This pattern continued for the detailed analyses demonstrating that students with general self-efficacy went to bed earlier and slept more minutes on Thursday and Friday of the high workload condition, with their most efficient sleep on Wednesday, suggesting they are not losing sleep worrying about the exam. Academically self-efficacious individuals appear to sustain their efforts leading up to the exam but restore their sleep on the night of the exam. Poor total sleep (PSQI) was negatively associated with general self-efficacy and academic self-efficacy. None of the other academic measures (Academic Conscientiousness and Test Anxiety) were significantly associated with absolute sleep scores. However, Test Anxiety (Tension and Bodily Symptoms) was negatively associated with good sleep as indicated by the Pittsburgh Sleep Index. Interestingly, more detailed analysis revealed students with Test Anxiety were sleeping less on Friday following the exam; this suggests a ruminative effect, whereby students may have been ruminating about how well they fared on the exam, causing worry and tension (McIlroy et al., 2000). According to Lund et al., (2010), student lifestyle can create factors that enhance stress-related sleeping for instance erratic schedules and high stress periods (exams, coursework deadlines). Lund suggests such students may not have developed sufficient coping mechanisms resulting in rumination and worry, causing sleep difficulties. Bodily Symptoms contributes the most variance to

duration, indicating that individuals who do not get enough sleep are more likely to experience bodily symptoms in relation to test anxiety. This resonates with the suggested rumination affect seen on the night following the exam and is consistent with H_8.

Emotional Intelligence

Consistent with the findings of Killgore et al., (2008) and H_8, on average emotionally intelligent students sleep well during low and high workload, going to bed earlier and sleeping a longer duration during high workload than their less emotionally intelligent counterparts. This continues for the night before the exam, however, their sleep is not efficient suggesting some pre-exam stress or worry. This is in line with conscientious and emotionally stable students. Further, emotionally intelligent students have fewer disturbances in the night and as a consequence function better during the day. Although emotional intelligence is well developed in many areas of academia, further exploration of it in relation to sleep might be productive.

Wellbeing

Previous research is mixed regarding the relationship between sleep and wellbeing (Gomes et al., 2011; Soehner, et al., 2007). The findings in the current study support the view that better sleep duration and quality is associated with better psychological wellbeing and quality of life (Galambos et al., 2009; 2010; Lund et al., 2010; Orzech et al., 2011). During high workload individuals with better mental health were in bed earlier, had longer sleep duration and more efficient sleep. Despite those with better wellbeing going to bed earlier and sleeping a longer duration the night before the exam, sleep efficiency was impaired regardless of mental wellbeing. This was restored however, following the exam. Consistent with research by Eliasson et al., (2002); Frederiksen et al., (2004) and Gaultney, (2010) on average students with less depression slept more and those with higher levels of depression slept less. This is also consistent with the finding in the current research that loss of sleep and sleep irregularity were associated with poor mood. Individuals with Positive Affect went to bed earlier and had better sleep duration during the low workload week; whilst their sleep duration shortened during high workload their sleep efficiency was good on all days, suggesting that students with positive affect are less prone to worry about the exam; this corroborates research by Galambos et al., 2009; 2010). Having health self-efficacy predicted good total sleep and good total sleep is predictive of good grades, showing particular importance for Sports Psychology. Total Sleep was associated with all the

wellbeing variables in the predicted direction. This further suggests that overall sleep is associated with the wellbeing of students. Higher levels of mental wellbeing may provide some defence against stress allowing individuals to go to bed earlier, sleep longer durations and subsequently perform better academically. As well as a direct effect, poor sleep may indirectly affect academic performance by impairing mood, decreasing wellbeing, compromising mental health and sleepiness may detract focus from study (BaHamman et al., 2012). Further, the goals of education are related to employability and learning for life with the ultimate objective of developing a well-rounded individual with a good work-life balance, time management skills, regularity and routine built into their lives.

Summary

It is evident that most students, regardless of their mental wellbeing status experience some anxiety leading up to an exam; however students with better psychological wellbeing, those that are conscientious, emotionally stable and emotionally intelligent and generally self-efficacious, attempt to go to bed earlier and maintain more regular sleep patterns. Other students engage in longer study the night before the exam which in turn can affect their wellbeing, mood, emotional intelligence and academic performance. Percentage change correlations were explored and were consistent with the absolute measures of sleep.

Alertness was not a significant predictor of poor academic performance or wellbeing; which is contrary to research by Manber et al., (1996) where higher levels of sleepiness and lower levels of alertness were reported to be associated with worse academic performance. This may be because students needed to remain alert for the examination in question and so experienced increased arousal. Overall, students with better mental wellbeing, higher Emotional Intelligence, more Self-Efficacy (general and academic) have a longer average sleep duration and better sleep quality. As a direction cannot be inferred, it may be that individuals with these characteristics sleep better. The most likely scenario is that one informs the other and a healthy cycle is implemented creating a protective buffer against high workload stressors. In this research Emotional Intelligence, good mental health (optimism and satisfaction with life), and Extraversion are showing as predictors of average sleep duration and average sleep efficiency in the high workload condition, further illustrating that these characteristics may provide some protection.

There is a definite shift showing that students do vary their sleep according to academic demands. This causes a loss of sleep and a decrease in sleep quality which can be

detrimental to their mental wellbeing and academic performance. It is apparent that certain qualities such as higher emotional intelligence and certain personality traits such as conscientiousness and extraversion (possibly mediated by lesser tendency to worry) can provide some protection against sleep impairment. Consistent with research by Galambos et al., (2010) individuals who sleep longer are more conscientious, have better general health and more positive affect. It is suggested therefore, that sleep interventions would benefit from including emotional intelligence skills training, and conscientious behaviours such as earlier sleep-wake schedules, achievement motivation and self-discipline, in addition to standard information on sleep hygiene and its benefits. Interventions could promote the importance of restorative sleep and sleep that is sufficient in quantity and quality. The subscale means of the Pittsburgh Sleep Index suggest that sleep disturbance and daily dysfunction contributed to the high global score, resulting in poor total sleep. Intervention programmes could highlight ways of reducing sleep disturbances and advise students that sleep impairments are reversible and so can be restored by implementing good sleep habits such as fixed bed and wake times, implementing circadian rhythm management, using the bedroom only for sleeping etc., (Forquer et al., 2008; Curcio et al., 2006); thus improving neurocognitive functioning leading to increased learning capacity, better academic performance and improved wellbeing. In a study by Orzech et al., (2011) education about sleep positively improved student wellbeing and academic performance suggesting that something as simple and inexpensive as a leaflet, combined with one-to-one counselling can be beneficial. Benefits of sleep intervention reported by Gaultney (2010) include improved academic performance, quality of life, cognition, mood and fatigue and increased retention rates.

Many other variables may affect students academic performance and wellbeing but sleep clearly has some impact and it would seem beneficial to include sleep hygiene interventions to promote good sleep practices in student populations that they can carry with them throughout their careers, (Galambos et al., 2010). Variables that may affect the sleep patterns of university students, include erratic schedules, part-time work (no one in this sample was working at the time this study was conducted), social changes, lack of parental guidance and varying academic demands (Gomes et al., 2002). So, it is understandable that sleeping patterns may change but this study illustrates that sleep alters for the worse during times when workload is high. Interventions could also include how better to cope with exam schedules (Gomes, 2002); this would be most beneficial in the

first year of university. One indication that this is being recognised, is the inclusion in some study guides, of a section that covers sleep regulation (Cottrell, 2007).

Strengths of the current research

Results highlight the need to distinguish sleep quantity from quality and highlight the importance of perceived sleep in addition to actual sleep in terms of an individual's feelings of wellbeing. This is in accordance with Bahamman et al., (2012) who found that subjective feelings of obtaining adequate sleep was the only independent predictor of excellent academic performance. This research, in light of call from Gray and Watson (2002) considered three distinct variables (sleep quantity, quality and time in bed). Further, objective data were considered alongside validated subjective data (PSQI). The findings suggest a large degree of consistency but some differences in relation to quantity and quality of sleep. Absolute scores were considered in addition to percentage change adding weight to the findings and exploring aspects that may have been masked through only considering absolute scores. Difference scores were also analysed, however, this approach added little to the findings so was not included. Nonparametric Circadian Rhythm analysis was conducted and whilst interdaily stability and intradaily variability were both non-significant, there was a significant effect for sleep onset. Validated self-report measures were used and associations between sleep and academic performance, test anxiety, self-efficacy, wellbeing, personality and emotional intelligence were clearly identified. This suggests that sleep may have an important role in the quest to fill the predictive space with a spectrum of individual difference measures, both proximal and distal to academic performance, and that impact on both the process and product of achievement (Richardson, Abraham & Bond, 2012).

Limitations and future directions

The sample size in the current research was relatively small; however it is considered an acceptable sample size in light of the objective measure used (actiwatch). Larger samples could be obtained by asking a large number of participants to complete the self-report data and by having a subsample wear actiwatches to verify the accuracy of the data. A further limitation was that the current research did not directly assess sleepiness (Eliasson et al., 2002; Gaultney, 2010); although level of alertness was not significant, nor was it associated with any of the variables. Future research could consider the variables studied

here across disciplines and universities and follow student trajectories into their chosen careers.

The current findings support the argument for the importance of good sleep quantity but particularly good sleep quality in relation to better academic achievement, improved wellbeing and reduced test anxiety. Also, the need to develop interventions that include Emotional Intelligence training and the increase of conscientious behaviours, as both seem to serve as some protection against poor sleep habits.

In summary, this chapter has contributed to knowledge in a variety of ways:

1. It has advanced sleep into the predictive map with an important place alongside individual difference variables with an integrated approach that is unprecedented.

2. This study has highlighted objective and subjective aspects of sleep indicators and addressed them both independently and with their linkages to each other in the context of wellbeingand academic performance.

3. The linkages of sleep to wellbeing for students provides focus on the central role of sleep in the regularity, rhythm and routine of daily behaviours that draw attention to the precedents and antecedents of adaptive sleep quantity, quality and duration and points to the need to inculcate students' wider holistic education.

4. Prediction of academic performance from sleep has emerged in this study and sleep is also postulated within the broad spectrum of individual differences (personality, emotion, cognition, regulation, optimism, hope etc.). The findings presented suggest that personality characteristics, emotional intelligence and other regulatory variables may predispose individuals toward adaptive or maladaptive sleep patterns and may thus provide a useful basis for future intervention studies or educational programmes that encourage and support sleep awareness and optimal sleep behaviours.

5. The study has identified a cycle of daily and weekly behaviours around exam and assessment times associated with fluctuating moods and sleep-related behaviours linked to high and low workload times, providing a micro patterns of information through which to navigate the pressures surrounding assessment tasks.

GENERAL DISCUSSION

This thesis is concerned with the academic achievement, wellbeing and quality of life of students enrolled on a psychology programme at a large university. It traces the individual difference profiles of over N = 400 students considering the processes, dispositions, distal and proximal indicators of good academic performance and overall life quality. This thesis is the first known to employ such a wide variety of individual difference measures in addition to objective and comprehensive academic achievement outcomes. One of the main features of this thesis was to include a wide range of performance outcome measures including module specific grades, individual examination grades, individual coursework grades, level averages and Grade Point Average. Limitations had been identified in the literature relating to measures of assessment and this is the first study to consider such a comprehensive range of outcome variables. Further, a wider range of individual difference variables were employed in this thesis than in previous studies. The various constructs were tested psychometrically to ascertain their predictive validity in relation both to academic performance and well being, and for their factorial validity and invariance across cohorts (or levels) of students. This approach facilitated ascertaining both the shared and unique contribution of each construct. Further, the research combined traditionally well-established constructs with the more recent dimensions related to Positive Psychology and incorporated both positive and negative indicators of academic performance, wellbeing and quality of life. The findings should benefit the scientific community by determining the most useful constructs in measuring academic performance and by highlighting factors that may improve the student experience including their academic performance and wellbeing; the findings of the current research are expected to inform a more effective pedagogy. Whilst the thesis as a whole is concerned with the individual differences that lend themselves to academic achievement, wellbeing and quality of life, each chapter looks at distinct aspects of individual differences in order to give a well-rounded and parsimonious view of their impact. With reference to the tripartite nature of the title in relation to academic performance and wellbeing, it can be seen that this thesis was developed within the context of multiple theoretical perspectives. Also, the research was driven by previous empirical work both in the choice of the constructs used and in filling the suggested gaps. Thirdly, the applied or pedagogical dimension was always envisaged so that the research would inform good practice both for tutors and students. These aspects will be summarised within this concluding section.

The distal impact of personality

Chapter 1 extended previous research on the relationship between personality and academic performance by delving into item level associations in addition to domain level associations. The idea was that focusing on the items would allow for more finely grained analysis which would thus attain more behaviourally specific predictions (Vries, Vries & Born, 2011). This coupled with more comprehensive indices of performance, was envisaged to make more prominent and clarify the associations that exist between personality and academic performance. The findings revealed there was benefit to considering personality at item-level, affirming that some associations were masked by the use of factor level (broad trait) analysis and level averages.

The main findings were that Conscientiousness had the most significant association with academic performance as it was significant in 7 of the 11 academic markers; followed by Emotional Stability which was significant in 5 of the 11 academic markers. Conscientiousness was associated to coursework, exam and average marks; Emotional Stability was associated to coursework and average marks but not exam. Analysis at item level for Conscientiousness was consistent with the broad correlations; however there were differences, whereas Conscientiousness was not correlated with Biological, Cognitive and Developmental coursework 2 or exam using the broad factors, some items were associated to both these academic outcomes. The same was indicated for Emotional Stability, which had some item level association that had been masked by domain level assessment. This affirms the proposal that using the broad domains may hide some of the intricacies only brought out through finer –grained analysis.

Chapter 1 was consistent with previous research that found Conscientiousness to be the most salient predictor of academic performance (e.g., Bratko et al., 2006; Conard, 2006; Komarraju *et al*., 2009; Komarraju et al., 2011). Whilst the literature for Emotional stability was contentious, from the current findings it is advocated that emotional stability is associated with academic performance due to higher levels of critical thinking and conceptual understanding and less focus on personal state which, according to Bidjerano and Dai, (2007) can hinder higher cognitive functioning and so decrease performance. The current research is consistent with Van Der Zee, Thijs, and Schakel, (2002) who found emotionally stable students performed better academically due to their ability to cope and manage their emotions, responding appropriately to stress and adapting to new challenges.

This study also took student profiles into account, and was concerned with the attributes that make a good psychology student. Therefore, in addition to Conscientiousness and Emotional Stability, an important finding in the study was the high mean scores on Agreeableness. Although Agreeableness is deemed to be least important in Higher Education in terms of predicting academic performance (Poropat, 2009), it is argued to have wider educational benefits. Openness did not emerge as a significant predictor of grades, which is consistent with numerous findings (e.g., Busato, Prins, Elshout & Hamaker, 2000; Kappe & Van der Flier, 2010), however certain items of Openness did show significant association including the ability to understand things quickly, the ability to understand abstract ideas, catching onto things quickly, handling a lot of information and probing deeply into a subject. This is in line with O'Connor and Paunonen (2007) who reported facets of Openness such as understanding and intellectual curiosity (probing deeply into a subject) were associated to academic performance but the overarching factor of Openness was not. Items of Extraversion also correlated with academic performance including being outgoing which was associated with five of the eleven performance outcomes. Consistent with Richardson and Abraham, (2009) and Parker et al., (2006) it appears students who ask for help and communicate with their teachers and peers, are able to facilitate the learning process. This is an important finding that would again be masked by domain-level analysis.

In summarising the outcomes of chapter one it should be noted that a using a combined average and subject specific approach to measure performance unearthed potentially disguised associations between personality and academic performance and it is evident that analysis at item level is useful as it shows some connection between personality and academic performance for all aspects of personality. The finding that Conscientiousness was associated was indicated in previous research however, given the comprehensive outcome markers Emotional Stability can also be considered as an important personality variable in the prediction of performance. The fact that personality is only associated to certain aspects of academic performance should not be underestimated, nor should its importance be undermined; if personality contributes in any way, this is an important development. Further the finding that Agreeableness is a defining factor in Psychology students adds to the understanding that individuals with certain personality traits choose certain programmes of education. All of these aspects add to existing knowledge and provide new potential for research in this field.

Proximal indicators of academic performance

Whilst chapter 1 concentrates on a more distal indicator of academic performance, in light of call from researchers such as Caprara et al., (2011) chapter 2 brought in proximal indicators. The focus of this chapter was to analyse the association between self-efficacy, text anxiety and academic achievement by measuring and comparing direct, indirect and total effects through mediation and path analysis. Further a general self-efficacy construct was considered in addition to an academic self-efficacy construct to determine whether general or academic efficacy is a better predictor of performance. The association between self-efficacy and test anxiety in relation to academic performance and their combined and predictive validity was also assessed.

Chapter 2 provides a discussion of the problems associated with test anxiety measurement and employs a four-factor model in an attempt to overcome these limitations. Previous research found the inverse relationship is frequently stronger for the cognitive components; particularly worry (e.g., Chapell et al., 2005; Keogh et al., 2012; Sparfeldt et al., 2005). The findings of the current study suggest that whilst the cognitive components are more strongly related to academic performance, the other factors should not be underestimated particularly if all students test anxiety needs are to be sufficiently addressed. Further, evidence was mixed in relation to test anxiety, as it has been considered with limited or ill-defined academic performance outcomes; whilst some attempts to overcome this have been undertaken (e.g., Sparfeldt, Rost, Baumeister & Christ, 2013) this study was still restrictive as it focused only on two subjects. The current study, as noted, employed a wide range of objective academic outcomes. This proved useful in establishing the link between test anxiety, self-efficacy and academic performance. An important finding was that test anxiety was more significant in Level 4 students than level 5 suggesting this would be a good cohort to target for intervention. The current study proposed that individuals suffering the effects of test anxiety in level 4 did not do well in their assessments and so dropped out by level 5 or their self-efficacy increased having done well, reaffirming the protective role of self-efficacy. It was proposed that the magnitude of the test anxiety/academic performance relationship may be affected by self-efficacy.

Consistent with a meta-analysis by Gore (2006) and Bandura (1986), the current research found that self-efficacy plays a bigger role later in a student's academic career; whilst still employed at level 4; academic self-efficacy subsumed the effects of test anxiety at level 5.

Further students did not draw from general self-efficacy at this stage; rather academic self-efficacy was the most salient predictor of grades. In light of mixed findings with studies employing varying self-efficacy measures including adapted versions of the published measures (Britner & Pajares, 2006; Usher & Pajares, 2006a; 2006b), unpublished scales developed for specific tasks (Bates & Khasawneh, 2007), general measures and specific measures (Phan, 2012), chapter 2 attempted to overcome these limitations by utilising both a general measure of self-efficacy and a specific academic measure. Findings suggested that the academic self-efficacy measure was a better indicator of grades; this is an important finding and advocates the use of measures specifically designed to measure academic performance, rather than the use of a more general measure in assessing academic performance at tertiary level. Whilst level 4 students did employ general self-efficacy, it is possible that students at this level are unsure of academic requirements at tertiary level and so academic self-efficacy has not had time to develop fully, therefore students draw on general efficacy resources. This research is consistent with Social Cognitive Theory that suggests self-efficacy is most predictive when it is measured at the same level as the subsequent performance (Choi, 2005).

In light of the aims outlined in the introduction to chapter 2, research affirmed that self-efficacy beliefs do appear to play a protective role in test anxiety in relation to academic performance and the academic measure is a better predictor of performance. Further, in light of call from Spada et al., (2006) this study adopted a longitudinal approach to data, collecting grades over a three year period. This enabled the associations to be traced across levels and affirmed that academic self-efficacy is functional and most adaptive at level 5 and that association exist throughout each level, with academic self-efficacy buffering the effects of test anxiety at later levels. Consistent with this a one-way ANOVA revealed that individuals with high academic self-efficacy have lower test anxiety indicating high levels of self-efficacy may lessen the effects of test anxiety total, and its cognitive subcomponents. Whilst self-efficacy is thought to vary across domains (Bandura, 2012), students scored above the midpoint on both general self-efficacy and academic self-efficacy (higher for academic self-efficacy). The inclusion of path models allowed a more advanced exploration of the impact of test anxiety and academic self-efficacy on academic performance and conveyed that for the level 4 cohort test anxiety and G/academic self-efficacy were predictive of grade outcome but at level 5, academic self-efficacy was the main contributor to academic achievement, which is consistent with the argument that

academic self-efficacy provides a buffer against test anxiety and poor achievement. When a path was added between level 4 and 5 average the variance for average 4 and 5 was 8% suggesting that self-efficacy and test anxiety still add incremental variance even when controlling for previous performance. However, as a regulatory variable that shapes beliefs, motivation, mastery and control, the general self-efficacy measure may still have general utility in the broader educational context.

Despite the associations between general self-efficacy and academic performance for the level 4 cohort, caution should be demonstrated in using the General self-efficacy measure for academic purposes; this study highlights that the academic self-efficacy measure demonstrated more validity. Further, the general self-efficacy measure did not demonstrate any associations for the level 5 cohort, whilst the academic self-efficacy measure was highly associated and was the most robust independent predictor variable. This is consistent with Bandura (2012), who highlights general trait measures may mask variability in individuals' beliefs in their capabilities for different activities such as academia.

Typical performance

One of the main aspects of this thesis was to consider typical performance, rather than maximal; it is not what a person can do, rather what a person will do that is of interest (Ackerman et al., 2011). Individual differences allow exploration into such phenomena. Personality, self-efficacy and test anxiety all give an indication of how an individual will react under pressure, how they will cope with academic, personal and environmental demands and, as the findings of the current study reveal, how they might perform academically. Trait emotional intelligence is also a factor that is to be considered when investigating the effects of individual differences on performance. Having a good level of emotional intelligence is thought to impact upon behaviour including the ability to perceive emotions, generate emotions, reflect on them without rumination and the ability to regulate emotions even after negative events (Petrides & Furnham, 2001; 2003; Petrides, Pita, & Kokkinaki, 2007). Students who have these skills are thought to be able to ward off anxious thoughts, practise more help seeking behaviours, have better problem–solving skills, and better coping strategies (Adeyemo, 2007; Bastian et al., 2005; Salovey et al., 2000). With skills such as these it is clear to see how emotional intelligence might influence academic achievement, for instance emotional intelligence might assist

individuals in coping with the heavy workload students often face, they might be more able to recover from academic setbacks and so move forward following academic difficulties; further, emotional intelligence might help students to balance these academic demands with social, family and work commitments. However, as discussed in chapter 3 the evidence for the emotional intelligence relationship is mixed due to methodological limitations including varying constructs used to measure emotional intelligence and these are then aligned with substandard indices of academic performance. The current thesis as stated aimed to overcome such difficulties and so used four popular constructs used for emotional intelligence measurement and aligned these with a good range of academic performance outcomes to ensure that all associations were maximised. In doing so, it is clear that certain measures of emotional intelligence are not appropriate for measuring its relationship with academic performance, whereas others appear more suitable.

One of the main themes of chapter 3 was to explore the validity of the emotional intelligence measures in their prediction of academic achievement. Findings suggested that the least valid predictor of academic performance was the Emotional Self-Efficacy Scale; whilst the most robust predictor was the attention subscale of the Trait Meta Mood Scale, followed by the Assessing Emotions Scale, the Trait Meta Mood Scale total and the Trait Emotional Intelligence Questionnaire; the Emotional Self-Efficacy Scale was not a valid predictor of grades. As highlighted, it has been suggested that some measures of emotional intelligence do not relate to performance, possibly due to measurement difficulties (i.e., their content may not be specifically relevant to the academic context).

An important finding was that emotional intelligence appeared to have more utility for level 4 than level 5 students; this is consistent with the suggestion that level 4 students are not well experienced with academia and so are drawing on wider resources at this level; this is consistent with Ebrahimi (2013) who found emotional intelligence was utilised during the transition period of university. Further, whilst level 5 students seem to draw less on emotional intelligence, it was utilised for statistics. The Trait Meta Mood Scale total was the strongest predictor here suggesting elements of each subscale (attention, conscientiousness and repair) are pertinent to statistical success. This is important given the centrality and recurrence of statistics and methods in psychology study programmes. The Repair subscale of the Trait Meta Mood Scale was employed in level 6; this is consistent with Fernadez, Berrocal and Extremera (2006); Pau et al., (2007) and Ebrahimi (2013) who suggested emotional intelligence is utilised more in times of stress. Level 6 is

considered the most stressful year as there is more resting on success and marks at level 6 count for 75% of a student's total mark.

The main aim of chapter 3 was to determine if emotional intelligence was associated to academic performance consistently, or whether various aspects of emotional intelligence related to various aspects of academic performance. Findings confirm that the path from emotional intelligence to academic performance is not straight forward. Whilst some associations were found correlations were low. Although emotional intelligence may not be the most robust predictor of academic performance there is some value in assessing this criterion and attempting to increase the emotional intelligence of students; this may only have a small impact on their grades but may make their time at university more manageable; it could be argued that regardless of the ability and academic performance of students, it is necessary for students to cope with everyday demands, pressures and anxieties; emotional intelligence is an important factor in its regard in determining what an individual will do, how they will respond to pressures and how they will manage their academic life with other commitments they might have (Yazici et al., 2011). Further, whilst there was some validity in considering individual assessments in addition to wider module totals and Grade Point Average, the association between emotional intelligence and academic performance was still limited, suggesting a possible problem with measurement, in terms of the direct relevance of the content for predictive validity. Whilst emotional intelligence and academic performance is an important exploration, the emotional intelligence measures were not specifically designed to measure academic performance and so are quite distal; it was considered much more likely that emotional intelligence would predict wellbeing and quality of life due to the constructs' component features. However, there is also the crucially important point found by Parker et al., (2006), that students who are low on emotional intelligence are more likely to drop out in the first year, and therefore emotional intelligence predicts academic success in terms of retention and progression.

Emotional intelligence as a proximal indicator of wellbeing

Chapter 4 considered the impact of emotional intelligence on wellbeing and wellbeing on academic performance. The first part of the study concentrated on the predictive validity of emotional intelligence beyond personality. As previous studies in this thesis, a cluster of measures was employed to demonstrate consistency and validity across constructs and to

determine the most robust indicators. Using a wealth of predictor and outcome variables assists in recognising emerging themes amongst constructs and results are likely to be less spurious or as a consequence of chance. The literature regarding the effects of emotional intelligence on wellbeing and quality of life were mixed, for example James, Bore and Zito (2012) found emotional intelligence was not predictive of wellbeing (depression and satisfaction with life) over Emotional Stability and some critics have argued that emotional intelligence may be redundant when used in combination with personality to measure outcome variables (Brody, 2004; Landy, 2005; Schulte, Ree & Carretta, 2004). Despite this, not much research relating to wellbeing and quality of life had controlled for the effects of personality (Zeidner et al., 2010) and of those that had, personality was considered in relation to limited wellbeing outcomes. The current research aimed to overcome such difficulties and found that consistent with previous research (e.g., Austin et al., 2005; Dawda & Hart, 2000; James, Bore & Zito, 2012; Petrides & Furnham, 2001; Saklofski, Austin & Minski, 2003) the findings of chapter 4 confirm that, of the personality variables, Emotion Stability has shown the highest associations with emotional intelligence. Moreover, and in light of the aims of this chapter, emotional intelligence was a valid predictor of wellbeing and quality of life above and beyond all the personality variables including emotional stability. Further, in contrast to James, Bore and Zito (2010) chapter 4 found emotional intelligence was a significant predictor of depression beyond emotional stability, accounting for an even higher percentage of variance; in addition emotional stability was no longer a significant predictor of satisfaction with life when emotional intelligence was added. Moreover, adding to previous research that shows incremental validity (e.g., Extremera et al., 2005; Chamorro-Premuzic et al., 2007; Davis & Humphrey, 2012; Furnham & Christoforou, 2007; Sanchez-Ruiz et al., 2013), this research shows that emotional intelligence has even stronger predictive validity than personality (including emotional stability) in numerous outcomes and suggests people who are able to repair their mood, and who have interpersonal and intrapersonal emotional intelligence have better wellbeing and life quality.

In accordance with recommendations by Zeidner (2012) this research looked independently into the effects of emotional intelligence on affective dispositions and cognitive states (e.g., hope and optimism); whilst the associations were similar in size and significance across the affective and cognitive wellbeing measures, emotional intelligence accounted for more variance in the cognitive factors than the affective; this was in contrast

to Koydemi and Schutz (2011), who found stronger associations for the affective components. However, Koydemir and Schutz only used one cognitive measure (satisfaction with life). These findings support the notion that only using one cognitive measure of quality of life can limit the findings and create a biased outcome and so advocates the multi-measure approach this thesis utilised.

Importantly, consistent with the findings from a meta-analysis conducted by Martins, Ramalho and Morin, (2010) the current research highlights that the Trait Emotional Intelligence Questionnaire is the most robust predictor of wellbeing and quality of life, whilst Trait Meta Mood Scale clarity and Repair subscales come a close second. Whilst Emotional Self-Efficacy Scale was associated with all wellbeing and quality of life variables, it had the least predictive validity of all the emotional intelligence measures (it offered small incremental validity in positive affect), followed by the Assessing Emotions Scale and the attention subscale of the Trait Meta Mood Scale which were only independently associated with General Health Questionnaire. This is an important finding and may inform the measures selected in future research. The results add to the growing body of research in confirming the distinctness of emotional intelligence from Personality. Further, it suggests that emotional intelligence is more significant than personality on a number of life outcomes.

Wellbeing as a distal predictor of academic performance

In line with the aims of the thesis and as an extension of chapter 4, the impact of wellbeing on academic performance was explored. There is a paucity of research in this area and it was considered vital to assess this under researched topic. As expressed, it stands to reason that wellbeing may impact upon academic achievement as high workloads, fears of assessment and balancing educational with personal and social commitments can place a burden on students ultimately affecting their academic performance (Austin, Saklofske & Mastoras, 2010; Imonikebe, 2009; Roh & Jeon et al., 2010). Academic stressors and difficulty coping have shown to have a negative impact on grades (Akgun & Ciarrochi, 2003; Austin et al., 2010; Shields, 2001; Struthers et al., 2000; Vaez & Laflamme, 2008). However, other wellbeing variables such as positive and negative affect, depression and anxiety and health self-efficacy have been less studied in relation to academic achievement. Positive constructs such as optimism and hope have been given a little more attention; nevertheless, the research is limited. Moreover, the research that does address wellbeing

suffers methodological limitations including mixed measures of assessment, non-validated questionnaires, questionable samples and unclear outcomes; chapter 4 takes these limitations into account and utilises the novel multi-measure, multi-outcome approach reiterated throughout this thesis

Consistent with previous research the findings suggested partial association with academic performance; some wellbeing attributes were associated with certain outcomes but not others. Consistent with student profiles reflected in the means and standard deviations, there were differences between cohorts. For level 4 the positive constructs of hope, positive affect and optimism were indicative of better academic performance; whereas for levels 5 and 6 both positive and negative aspects were associated including health self-efficacy, negative affect, anxiety and depression for level 5 and health self-efficacy, optimism, negative affect, anxiety and satisfaction with life for level 6. It is interesting to note that negative attributes only come into play from level 5; these findings again suggest level 4 is tapping into different resources than levels 5 and 6. These students are perhaps more hopeful and optimistic which could possibly be due to less demands and a focus on adjustment, rather than academia; given that marks do not count toward final mark at level 4 it is possible that students are more relaxed, hopeful and optimistic. Once the pressures of university build the wellbeing/academic performance relationship may become more salient. The findings reflect those of Goetz et al., (2002) and Rode et al., (2007) asserting that students experience positive emotions as much as negative and that these impact academic performance.

Overall, chapter 4 adds to previous literature in establishing the usefulness and predictive validity of emotional intelligence in wellbeing and quality of life for students in tertiary education by using more advanced methods of analysis and more predictor and outcome variables. Further, it highlights the importance of examining the wellbeing/academic performance relationship offering more robust and consequently reliable findings than previous research.

Bringing individual differences together and assessing their impact in relation to sleep behaviour

Whilst sleep is considered an aspect of wellbeing, it was considered too complex to include in the wellbeing chapter and so a chapter was dedicated to sleep in relation to academic performance and individual differences. Sleep was analysed during a period of high

workload in comparison to a period of low workload to establish if sleep patterns were different and if so, whether this impacted upon the individual differences employed in this thesis (personality, emotional intelligence, self-efficacy and wellbeing) and on academic performance. Evidence for the association between sleep and individual differences is mixed and prior studies into sleep limited. Most rely on self-report measures to assess the quantity and quality of sleep; they also provide little information on how academic performance is assessed and do not fully consider confounding variables. As noted by Dewald et al., (2010) due to the methodological differences between studies and inconsistent results, it is difficult to draw definitive conclusions about the relationship between sleep and other variables such as academic performance and wellbeing. As recommended by Dewald et al., (2010) and Galambos et al., (2010) chapter 5 explored sleep using Actigraphy in addition to self-reported sleep measures for a full rounded view and, in light of call from Brick, Seely and Palermo (2010) and Taylor et al., (2011), more comprehensive measures and predictor variables were employed. Further, as suggested by Gray and Watson (2002), all three measures of sleep (quantity, quality and schedule) were included and were measured simultaneously. The current study explored the three main and distinct aspects of sleep: sleep quantity (duration), sleep efficiency (sleep quality), and sleep variation and irregularity (from low workload to high workload conditions).

The findings revealed the importance of good sleep quantity, but particularly good sleep quality in relation to better academic achievement, improved wellbeing and reduced test anxiety. Students with better mental wellbeing, higher Emotional Intelligence and higher self-efficacy (general and academic) had longer average sleep duration and better sleep quality. Further results found that assessment is detrimental to sleep the night before an exam and for students with high test anxiety, following the exam. Overall, taking into account predictive validity the main predictors of good sleep were extraversion, optimism, and emotional intelligence resulting in better satisfaction with life.

It was interesting to discover that sleep in low workload condition was mainly associated with dissertation marks, suggesting good quality sleep during low workload contributes to the end product in terms of marks for ongoing projects. The effects disappeared for a short time during high workload, where attention was required elsewhere. Overall, students time in bed, assumed, actual and sleep efficiency was most regular and associated with academic performance in the low workload condition; whereas in the high workload condition students appeared to be losing sleep which could be having a negative impact

upon their performance. The pattern with sleep and academic performance as measured using the Pittsburgh Sleep Index showed a similar story; as expected sleep disturbance and daily dysfunction had a negative effect on academic performance, with dysfunction showing associations with more modules; importantly though, both disturbance and dysfunction were negatively related to Occupational Psychology (the exam sat on Friday of the High Workload Week). Total Sleep (TS was poor) and negatively associated with academic performance and most importantly with Grade Point Average. Total sleep did not impact upon the Dissertation module, this is likely because it is an on-going project and so unaffected by variable sleep patterns.

Findings suggested that sleep was compromised during high workload (exam) week, particularly the night before the exam. Further, students were getting up earlier and therefore losing 30 of minutes sleep per day; the pattern was, however, the same across the week, with rise times shifting for each day. So, there was clear evidence that the critical workload week had a detrimental effect on sleep. Subjective sleep data mirrored these findings illustrating sleep quality dropped on Thursday of the high workload week. The trend is repeated for mood which plummets on Thursday in week 2. Percentage change also reflected absolute minutes with students going to bed later on Thursday than all other days, once again demonstrating they may be cramming for their exam or worrying about their exam the next day (Friday). High academic workload was associated with irregular sleep patterns and a significant loss of sleep the night before the exam. Although average Time in Bed, Assumed Sleep and Actual Sleep do not differ significantly when assessed using absolute scores, when altered to percentage change, differences between these measures were evident. Sleep efficiency is consistently poorer in the high workload compared to low workload condition and percentage change analysis revealed a significant difference between average sleep duration in the high workload week compared with low workload, with students losing approximately 60 minutes in the former.

Whilst the Pittsburgh Sleep Index mirrored the Actiwatch findings to some extent, an interesting finding was that although objective measures indicated poor duration, students rated their duration as adequate. This suggests that although perception of sleep can be different, it can be as important as objective sleep, having an impact upon the way an individual functions the following day. This in accordance with Bahamman et al., (2012) who found that subjective feelings of obtaining adequate sleep was the only independent predictor of academic performance.

Overall, findings suggested most students feel some pressure or stress leading up to an exam, however individuals with better wellbeing went to bed earlier and spent more minutes in bed suggesting less active worrying. The results suggest that increased self-efficacy, higher emotional intelligence and better mental wellbeing may provide some defence against stress; thus these individuals are able to go to bed earlier and sleep longer durations, possibly enabling students to perform better academically and function better during the day. Sleep quality (measured as sleep efficiency) was found to be the most important variable relating to optimal functioning and it was evident that sleep loss occurs during periods of high workload, particularly the night before an exam. The current findings set the scene for further research into how sleep/wake patterns differ in times of high stress compared to low and how sleep related to important individual difference criteria such as personality, self-efficacy, test anxiety, emotional intelligence, wellbeing and quality of life. Sleep was considered pertinent to the study of individual differences amongst students in tertiary education.

Cohort comparisons of personality and emotional intelligence

Cohort comparisons were considered for personality and for emotional intelligence to assess cohort norms and to establish variance, consistency and stability across measures and findings. Chapters 1 (Personality) and 3 (Emotional Intelligence) tested whether the personality profiles of students from different cohorts approximated each other given the choice of a common subject (psychology). Both Personality and Emotional Intelligence scores were within the normal range for all cohorts; however analysis of variance revealed significant differences attributable to the 2012 group on Emotional Intelligence. Therefore, whilst within the normal range, differences in expression did emerge.

An important aspect of the cohort comparison was to establish if students' personality profiles predispose them to choose given subjects as suggested by Sánchez–Ruiz, Pérez-González, & Petrides, (2010). With regard to chapter 1, personality profiles are thought to vary according to a student's choice of programme, for example social science students (including Psychology) have shown to be higher on Agreeableness than technical science students (Larson, Wei, Wu, Borgan, & Bailey, 2007); Chapter 1 explored whether the students in all groups had high Agreeableness as a defining variable (i.e. highest mean score) as suggested by Lantz (2011).

The findings revealed that stable means were demonstrated across groups with some minor differences in order of rank, suggesting differences in expression. All cohorts scored lowest on Conscientiousness, yet Agreeableness was invariably first for all groups. To further affirm whether agreeableness was a defining factor amongst psychology students, personality profiles from a group of students enrolled on an engineering programme were also considered. These findings confirmed that Agreeableness was indeed a defining factor for Psychology students.

Limitations and future directions

The present study was limited in a number of ways; an extensive feature of this thesis was the use of self-reports, these have harvested some criticism (Cooper, 1998; Zeidner et al., 2008) including inherent problems such as social desirability and response set bias that deem self-reports ambiguous and open to interpretation (Bing, Whanger, Davison & VanHook). Steps were taken to reduce socially desirable answers, such as asking the respondents not to think too much about their answers. Further, although it is possible that shared method variance may have inflated the relationships between measures, self-report measures were used alongside academic performance outcomes, thus avoiding the bias of common method variance (Tabachnick & Fiddell, 2007). Further the academic performance indices were longitudinal and as such reduce the likelihood that results are spurious, incidental or only relevant at particular levels. Longitudinal analyses were recommended by (Mavroveli & Sanchez-ruiz, 2010) and employed in the current study.

Moreover, given that objective measures have been found to be measuring cognitive abilities rather than subjective perceptions, self-report seems more suitable to the perception of individual differences. Self-reports are based on the intrapersonal and interpersonal qualities and perceptions of an individual and so are intrinsically meaningful, thus influence behaviour and life outcomes regardless of whether or not reflections are entirely accurate (Perez & Repetto, 2004; Petrides, Pita & Kokkinaki, 2007). Further, within the framework of cognitive psychology how a situation is appraised varies between individuals and has no meaning outside of a person's mind (Cooper, 1998; Hojat et al., 2003); therefore, it is not the event itself but the individual's appraisal of that event that determines whether they experience maladaptive responses (Beck, Rush, Shaw & Emery, 1979). Self-report may capture the inner workings of a person's mind and their world as they see it. Moreover, as individual differences in behaviours, emotions and cognitions are

highlighted as useful components for study, future research would do well to further consider a wider range of individual differences including emotional intelligence, self-efficacy, test anxiety and wellbeing in relation to academic performance and student experience.

Another limitation is that many of the findings are based on correlational analyses and whilst causality cannot be inferred from this, causation is often implied when relationships between variables are systematic and robust. For instance conscientiousness, self-efficacy, test anxiety and academic performance demonstrate discriminant, convergent and predictive validity in the expected direction. Consistent relationships between variables highlighted in the literature and supported in this thesis inform construct validity. Further, regression analyses and modelling allow for clarification and assessment of incremental and predictive validity (Austin et al., 2005). Future research should consider using path analysis, even more extensively than this research has done, as a way to enhance the possibility of causality. Further, longitudinal performance markers were employed in this study which allowed patterns and consistency across the levels of study to emerge. Future research may wish to consider collecting self-report measures throughout the levels in addition to longitudinal grade assessment.

A further limitation was that the groups were fairly homogenous in that the majority of students studied Applied Psychology; although some were on combined programmes and a subsample were taken from Engineering. Cross cohort research and comparing means from another School allowed a small view into programme consistency and variations. Moreover, the effects of gender were not assessed; this is because the groups were mainly female. It has often been noted that individual differences do not always translate into performance (Chapell et al., 2005). However, researching cohorts from across different Schools and considering similarities and differences in relation to various programmes of study and between males and females may be useful and would possibly increase the generalisability of the results. The current study however is considered representative of the population within social sciences.

Previous performance and intelligence were not assessed in this research as previous finding suggest they have limited validity beyond personality variables in tertiary education (Furnham, 2009). Future research could, however, include ability testing and previous performance to ensure a comprehensive investigation. Finally, although the

investigations in the current thesis considered both distal and proximal indicators of academic performance, this study is nomothetic rather than ideographic; comparing mean scores through large samples may not truly capture what is happening within an individual student's experience (Martin et al. 2006). The nomothetic approach is useful in identifying broad general trends that optimise performance for all students. Such an approach cannot demonstrate, however, how much an individual has improved their personal performance because they have adapted a repertoire of certain behaviours. However, the current research does highlight the attitudes, beliefs and behaviours that would be best suited to academic success. Future studies could attempt to address these limitations and to monitor personal growth trajectories into post-tertiary level education and progress along career pathways.

This thesis highlights the validity in considering the unique variance of individual difference measures in relation to each other; future research could do this across majors across varying Schools (i.e., other Sciences, Business and Law and the Arts). For instance, whilst psychology students possess certain attributes that are relevant to their chosen study domain, for example being cooperative with individuals, and having a positive, pro-social and supportive nature (Zeidner, Roberts & Matthews, 2008), this may not be the case for students on other programmes. Further, whilst cohort norms have been considered here, this research could be extended to include individual difference profiles in relation to grades for each cohort. Finally, it might be interesting for future research to determine if those who have withdrawn from the programme have lower positive and higher negative individual differences as suggested by Parker, Reque and Barnhart et al., (2004).

Interventions and pedagogical applications

Although the present study has not incorporated interventions, it has highlighted strategies that might help students to optimise their academic performance, wellbeing and quality of life. It has highlighted the need for intervention in relation to each area analysed within this thesis. Whilst it would be difficult to intervene in all areas considered useful, if the main goal is increased academic performance perhaps strategies on how to improve self-efficacy and thus reduce test anxiety would be most appropriate. Interventions that target some students and not others may provoke ethical problems; therefore it could be useful to incorporate strategies aimed at increasing helpful beliefs, attitudes and behaviours into existing tutorials or seminars. Studies interested in assessing the before and after effects of

intervention might target vulnerable or at risk groups and average groups to consider fully the beneficial effects. Intervention proposals for relevant individual differences are highlighted at the end of each chapter. Apart from interventions, the pedagogical objective would be the continued promotion of the constructs so that they can continue to permeate the ogoing consciousness of educational philosophy. This is applicable to students in terms of the non-ability factors that support learning and enhance achievement, but it is also applicable to education in relation to advocating clearly the process and pathway to achievement.

Overall findings and contribution to knowledge

This research has highlighted several important practical, theoretical, didactic and pedagogic implications. The results of this thesis have confirmed the relative importance of distal and proximal indicators of academic performance. Further, as suggested by O'Connor and Paunonen (2007) this study used a wide variety of academic outcome measures not used in previous research and results clearly demonstrate the benefits of this approach.

Results of analyses can vary depending upon the sample size, diversity within the sample, the number of variables, the instruments used to measure each variable, differing outcome criteria and so forth (Poropat, 2010). This study has attempted to overcome some of these issues by employing a good sample size, using a cluster of individual difference measures considered pertinent to the outcomes and by considering a wide spectrum of objective outcome variables (grades). Further, this thesis includes archival longitudinal data which increases the generalisability of the results. In addition to self-report, it has also included experimental data (sleep) and considered incremental and predictive validity by including regression and path analyses; this arguably means it is possible to interpret the data as causal rather than correlational (Mavroveli & Sanchez-Ruiz, 2011).

A cluster of measures was employed to demonstrate consistency and validity across constructs and to determine the most robust indicators. Using a wealth of predictor and outcome variables assists in recognising emerging themes amongst constructs and results are likely to be less spurious or as a consequence of chance. One of the main features of this thesis was to include a wide range of individual difference measures, particularly in relation to emotional intelligence and to wellbeing in order to assess validity and consistency across measures. The current research successfully did this and the most

appropriate measures in relation to the outcomes that were being measured have been highlighted throughout this thesis.

Moreover, the current research contributes to knowledge by including a vast range of objective performance outcome measures; these included module specific grades, individual examination grades, individual coursework grades, module averages, level averages and Grade Point Average. Limitation had been identified in the literature relating to measures of assessment and this is the first known study to consider such a comprehensive range of outcome variables. The findings demonstrate this was a useful approach as some important associations would have been masked by only considering Grade Point Average or one specific grade outcome.

It is important to recognise that students' application to their studies can be determined by numerous individual difference factors; all the constructs used in this thesis are valid and reliable indicators of academic achievement; however the current study highlights that some are better designed to assess academic performance than others. Of the more distal constructs, the usefulness of the Five Factor Model has been highlighted, particularly Conscientiousness and Emotional Stability in relation to academic performance; all other aspects of personality had some association at item level advocating the use of this in future research. This might also be considered if researchers wish to create a new measure that is designed specifically to assess the association between personality and academic performance. Findings reveal individual difference measures that are more proximal to performance are better indicators of achievement; whilst distal indicators such as personality, emotional intelligence and wellbeing may have important and non-negligible impact on performance, they are not designed to specifically measure academic performance outcome; it would be useful if measures were developed that included items specifically relating the effects on academic achievement.

All of the individual differences assessed in this thesis are useful indicators of the action that an individual will take, regardless of their ability, and as previously noted it may be more important to consider what an individual will do, rather than what they can do (Ackerman et al., 2011). Numerous factors can affect whether an individual applies themselves and so achieves the goals they desire. Many students who are capable of achieving at university may not reach their full potential due to individual difference factors. The current research contributes to knowledge by suggesting which individual

differences are most salient to academic performance and which are most salient to wellbeing and quality of life.

An important finding and contribution to existing knowledge was that level 4 appear to tap into different resources than levels 5 and 6; this is consistent across chapters. For instance level 4 drew more on emotional intelligence and general self-efficacy; whereas 5 and 6 appear to draw more on academic self-efficacy and wellbeing and quality of life is more closely entwined with academic achievement. Test anxiety was more significant in Level 4 students than level 5 suggesting this would be a good cohort to target for intervention. The current study proposes that individuals suffering the effects of test anxiety in level 4 did not do well in their assessments and so dropped out by level 5 or their self-efficacy increased having done well, reaffirming the protective role of self-efficacy. Perhaps a more likely scenario is that students at level 4 are unsure of academic requirements at tertiary level and so academic self-efficacy has not had time to develop fully, therefore students draw on distal resources such as general self-efficacy and emotional intelligence. Another important finding was that academic self-efficacy subsumed test anxiety at level 5 and academic self-efficacy was the most salient predictor, whereas unlike level 4, general self-efficacy was not engaged. This study ran concurrently with a university study on the Sophomore Slump, and although not designed to be part of that work, some of the outcomes from this research might prove useful.

The means from the current research demonstrate that whilst average mental health is indicated students in level 5 have slightly low levels of hope and optimism and slightly elevated levels of anxiety and negative affect, which could suggest that students are an at risk group for mental health problems and decreased academic performance; this is consistent with research by Stallman (2010) who found students to be high risk group. Further, within the current study level 5 appear more at risk than level 4, which could be indicative of increased workload and pressure, given their performance counts toward their final grade. Students in the current study however have higher levels of health self-efficacy which may provide a buffer against mental health difficulties developing and decreased academic performance.

The current research informs the need to ensure students have access to counselling, intervention programmes or health awareness in order to protect them from developing mental health problems and to ensure their academic performance does not decrease. More

pressure at level 5 may increase problems with mental health; mental health is prevalent in students but it would be interesting, in light of the findings from this thesis to determine when onset of difficulties begin. It is suggested here they begin in level 5; students should perhaps be targeted in level 4 to prevent such negative attributes taking hold.

The thesis was the first study to employ such comprehensive individual difference measures in association with comprehensive objective grades. In particular, the current research adds to previous literature in establishing the usefulness and predictive validity of individual differences in a tertiary education setting. Advanced statistical analyses including regression and path analyses to assess incremental and predictive validity means it is possible to interpret some of the findings as causal, or at least to argue that the models presented are justified theoretically, empirically, pedagogically and conceptually.

This study confirms the validity and necessity of assessing individual differences in relation to academic outcome, process and experience. The power of an individual or their success could be dependent upon whether such aspects are recognised and nurtured within the academic environment. Additionally, the impact of the various traits explored here would imply that the distal nature of the impact of students' personalities on ultimate performance may emerge more persuasively as students progress through education and when independent and less supported study is required (e.g., from level four to level five). This might explain some of the important differences found between levels 4 and 5. This thesis informs the need for student performance and experience to be considered holistically and in addition to established intellect. Feeding back to university personnel and the wider educational community on the benefits of promoting positive attributes such as emotional intelligence, adequate sleep quality, self-efficacy, optimism, hope, health self-efficacy and positive affect and the inclusion of strategies to lessen negative attributes such as test anxiety, negative affect, anxiety and depression to enhance performance and quality of life could determine the practical value of the current thesis.

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Appendix 1. Ethical Approval

RE: Application for Ethical Approval No.: 11/NSP/057

Mon 28/11/2011 15:12

Dear Karen,

Satisfaction of Provisos - Full Ethical Approval

With reference to your application for Ethical approval:

Self-efficacy, Emotional Intelligence, Personality, Wellbeing, Statistics and Exam Anxiety and their Association with Academic Performance

On behalf of Liverpool John Moores University Research Ethics Committee (REC) the Chair of the Committee has reviewed your response to the request for further information related to the above study. The Committee is now content to give a favourable ethical opinion and recruitment to the study can now commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project will be reported to the Committee immediately;
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately;
- any substantive amendments to the protocol will be reported to the Committee immediately.
- the LJMU logo is used for all documentation relating to participant recruitment and participation eg poster, information sheets, consent forms, questionnaires. The JMU logo can be accessed at http://www.ljmu.ac.uk/corporatecommunications/60486.htm

For details on how to report adverse events or amendments please refer to the information provided at: http://www.ljmu.ac.uk/RGSO/RGSO_Docs/EC8Adverse.pdf

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be **28th November 2016**. An application for extension of approval must be submitted if the project continues after this date.
Yours sincerely
PP:

Professor Andrew Young
Chair of the LJMU REC
Tel: 0151 904 6463
E-mail: j.m.mckeon@ljmu.ac.uk

Appendix 2 : Participant Forms
2.1 Participant Information

What will happen to me if I take part? You will be asked to complete a series of self-reports which should take no more than 30 minutes of your time. These self-reports aim to determine your personality type, level of emotional intelligence, wellbeing, self-efficacy and level of test anxiety. All questionnaires are self reports and there are no right or wrong answers. It would be preferential that you answer the questions quickly and without too much thought and responses should be based on how you see yourself at this point in time not how you would like to see yourself in the future.

Study title: Self, Efficacy, Emotional Intelligence, Personality, Wellbeing, and Test Anxiety and their Association with Academic Performance.

What is the research study about? This study will investigate whether personality, self-efficacy, emotional intelligence and test anxiety can be used as predictors of academic performance beyond cognitive ability. It will also measure whether perceived wellbeing enhances overall student experience and performance outcome.

Why have I been chosen? You are undergraduate students and so fully immersed in the student experience and you will undertake numerous coursework assignment and examinations throughout the duration of your studies. With regard to university life and potential careers that my follow identifying your personality traits, level of emotional intelligence, text anxiety and self efficacy may assist you in your continuing careers and academic performance. Not all students may wish to participate however the aim is to include as many students as possible in order to achieve the largest possible sample size.

Do I have to take part? Participation is not compulsory. If you are willing to take part then you will be asked to sign a consent form. Even after giving consent you may still withdraw from the study at any time without giving a reason or explanation and all your data will be destroyed.

What are the possible disadvantages and risks involved, if any? There are no identified risks to taking part and you will not be disadvantaged in any way. If you do have any questions or concerns the researcher can be contacted at any time, before, during and after the study.

What are the possible benefits of taking part? Identifying where you lie within these scales can assist you with your personal development enabling you to identify areas of strength and areas that can be improved, helping you to achieve the best from your studies. The results of the study will also allow the researcher to determine if these measures predict academic performance beyond cognitive ability and whether wellbeing is related to student experience.

Will my taking part in this study be kept confidential? All information you provide will be kept strictly confidential. I would ask you to put your student number on the questionnaires as it will be necessary to access your academic records; for some of you (levels 1and 2) I will be accessing your records at the end of each year of study. Once I have aligned your test scores with your academic records your student numbers will be removed and your data will be completely anonymous so that you cannot be identified. Your signed and dated consent form will be kept separately from your completed self-reports so that you cannot be identified. All information will be stored securely and shredded within six months of completion of the study.

What will happen to the results of the research study? The results of the study may be used for publication and for post-graduate research. If this data is used in any way you will not be identified.

Has this study been approved by an ethics committee (state name of committee)?
This research study has been approved by the LJMU School of Psychology Research Ethics Panel/REC

Who to contact with enquires about this study? If you require any further information please contact Karen Poole who is organising this study: k.poole@.ljmu.ac.uk

2.2. Participant Information for the study on Sleep (chapter 5).

LIVERPOOL JOHN MOORES UNIVERSITY

PARTICIPANT INFORMATION SHEET

Title of Project*:* Personality, academic performance and sleep behaviours in an undergraduate population. Name of Researcher and School/Faculty

Karen Poole School of Natural Sciences and Psychology

You are being invited to take part in a research study. Before you decide it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask if there is anything that is not clear or if you would like more information. Take some time to decide if you want to take part of not.

What is the purpose of the study? The aim of the study if to look at the sort of problems students might have with the demands of undergraduate life and to ask how this affects the timing and duration of their sleep. There is considerable evidence to show that this period in a young person's life is particularly difficult for students who have to juggle the demands of academic study with social expectations and other work or family related responsibilities. We would like to use a number of simple unobtrusive measures to look in more detail at the typical sleep patterns of young, healthy adult students and to explore the relationship between day-time function and night-time sleep. We can do this using a small, wrist-worn device which will provide a continuous record of your sleep and wake times over a week long period. This will be during a period when you have a heavy workload, such as during a week when you have exams or coursework deadlines, and during a rest period, such as low workload. We would like to take additional measures, mainly self-report, of how you feel when you first wake in the morning and whether you believe you normally get sufficient duration or quality of sleep. The main self –report measure we will be looking at include personality, self-efficacy, emotional intelligence, test anxiety and general wellbeing.

Do I have to take part? No. It is up to you to decide whether or not to take part. If you do you will be given this information sheet and asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw will not affect your legal rights.

What will happen to me if I take part? You will be asked to complete a series of self-reports which should take approximately 30 minutes of your time. These self-reports aim to determine your personality type, level of emotional intelligence, wellbeing, self-efficacy and level of statistics and exam anxiety. All questionnaires are self reports and there are no right or wrong answers. It would be preferential that you answer the questions quickly and without too much thought and responses should be based on how you see yourself at this point in time not how you would like to see yourself in the future.

You will be invited to take part in a 14 day trial.

Things we will measure:

Self-report questionnaire. On day 1 of the study we would like you to complete a booklet of questions relating to your personality, emotional intelligence, self-efficacy, test anxiety and general wellbeing (1 hour). You will later complete a diary of your sleep patterns (5 minutes).

Sleep. During each 7 day period we would like you to wear the activity monitor on your wrist all the time, with the exception of when you take a bath, shower or go swimming. This will tell us when you sleep, how long it lasts for and how many times you are woken during the night. We would also like you to tell us how well you feel you have slept and what sort of mood you are in when you wake in the morning. You do this by completing a short diary each morning.

Academic records. We would like to use the data collected in the above measures to explore potential relationships between sleep behaviours and your academic performance. For that reason we would like to have your permission to incorporate your coursework and exam marks in our analysis. This information will remain confidential to the research study (see below) and will be presented in any final report in the form of general trends without identifying individual participants.

Are there any risks / benefits involved? None

Will my taking part in the study be kept confidential? All the information we hold about you, including your personal details and all the information we collect during the study will be highly confidential. A single paper record of your name, address and telephone number will be available to the researcher named below and used to link with your academic records. These details will be kept in a secure place and destroyed at the end of the study. We will give you a participant number which will be used on all other records. Records of the information we collect during the study will only show that number, not your name.

If you have any concerns during the study then please contact the researcher using the details below. Finally, whilst your participation is very much appreciated, please remember that you are free to withdraw from this study at any time.

Contact Details of Researcher

Karen Poole
School of Natural Sciences and Psychology
Room 229 Tom Reilly Building
Byrom Street
Liverpool
L3 3AF
Tel : 0151 904 6329
Email : **k.poole@ljmu.ac.uk**

2.3 Consent form for chapters 1 -4

LJMU School of Psychology
Research Participant Consent Form

Title of Project: Self, Efficacy, Emotional Intelligence, Personality, Wellbeing, and Exam Anxiety and their Association with Academic Performance.

Name of Researcher: Karen Poole **Please initial box**

1. I confirm that I have read the participant information sheet or been verbally informed about what is required of me in this study. I have been informed of the time it will take to complete the study and I have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected. ☐

3. I understand that information I may provide to the researcher will remain confidential and secure in accordance with ethical gui delines of the British Psychological Society, and furthermore that my name will not be linked to any data used in publications or research reports arising from this study ☐

4. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent (if different from researcher)	Date	Signature
Name of Researcher	Date	Signature

2.4 Consent form for the sleep study (chapter 5).

LJMU School of Psychology
Research Participant Consent Form

Title of Project: Personality, academic performance and sleep behaviours in an undergraduate population

Name of Researcher: Karen Poole **Please initial box**

1. I confirm that I have read the participant information sheet or been verbally informed about what is required of me in this study. I have been informed of the time it will take to complete the study and I have had the opportunity to ask questions. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected. ☐

3. I understand that information I may provide to the researcher will remain confidential and secure in accordance with ethical gui delines of the British Psychological Society, and furthermore that my name will not be linked to any data used in publications or research reports arising from this study ☐

4. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent (if different from researcher)	Date	Signature
Name of Researcher	Date	Signature

2.5 Participant Debrief

Debrief

Firstly thank you for your time today. Today's study was all about exploring whether personality, emotional intelligence, self-efficacy, test anxiety, sleep and general wellbeing can influence university course grade. You completed a series of questions, with some overlap to ensure that all as pects were covered adequately. We are interested in whether your personality, level of emotional intelligence etc., are related to your academic performance. Previous research suggests that it is. This study is bringing together different aspects of that research and we are conducting an in depth, longitudinal analysis.

References: (Key references were provided for the students taking part in the study)

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Appendix 3: Self-Report Measures
3.1 Five Factor Model (100 item version) (Goldberg et al., 2006)

On the following pages, there are phrases describing people's behaviours. Please use the rating scale below to describe how accurately each statement describes ***you***. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then circle the appropriate number.

Response Options
1: Very Inaccurate **2**: Moderately Inaccurate **3**: Neither Inaccurate nor Accurate
4: Moderately Accurate **5**: Very Accurate

1.	I am the life of the party	**1**	**2**	**3**	**4**	**5**
2.	I feel comfortable around other people	**1**	**2**	**3**	**4**	**5**
3.	I start conversations	**1**	**2**	**3**	**4**	**5**
4.	I talk to a lot of different people at parties	**1**	**2**	**3**	**4**	**5**
5.	I don't mind being the centre of attention	**1**	**2**	**3**	**4**	**5**
6.	I Make friends easily.	**1**	**2**	**3**	**4**	**5**
7.	I Take charge.	**1**	**2**	**3**	**4**	**5**
8.	I know how to captivate people.	**1**	**2**	**3**	**4**	**5**
9.	I feel at ease with people.	**1**	**2**	**3**	**4**	**5**
10.	I am skilled in handling social situations.	**1**	**2**	**3**	**4**	**5**
11.	I don't talk a lot.	**1**	**2**	**3**	**4**	**5**
12.	I keep in the background.	**1**	**2**	**3**	**4**	**5**
13.	I have little to say.	**1**	**2**	**3**	**4**	**5**
14.	I don't like to draw attention to myself.	**1**	**2**	**3**	**4**	**5**
15.	I am quiet around strangers.	**1**	**2**	**3**	**4**	**5**
16.	I find it difficult to approach others.	**1**	**2**	**3**	**4**	**5**
17.	I often feel uncomfortable around others.	**1**	**2**	**3**	**4**	**5**
18.	I bottle up my feelings.	**1**	**2**	**3**	**4**	**5**
19.	I am a very private person.	**1**	**2**	**3**	**4**	**5**

20.	I wait for others to lead the way.	**1**	**2**	**3**	**4**	**5**
21.	I am interested in people.	**1**	**2**	**3**	**4**	**5**
22.	I sympathize with others' feelings.	**1**	**2**	**3**	**4**	**5**
23.	I have a soft heart.	**1**	**2**	**3**	**4**	**5**
24.	I take time out for others.	**1**	**2**	**3**	**4**	**5**
25.	I feel others' emotions.	**1**	**2**	**3**	**4**	**5**
26.	I make people feel at ease.	**1**	**2**	**3**	**4**	**5**
27.	I inquire about others' well-being.	**1**	**2**	**3**	**4**	**5**
28.	I know how to comfort others.	**1**	**2**	**3**	**4**	**5**
29.	I love children.	**1**	**2**	**3**	**4**	**5**
30.	I am on good terms with nearly everyone.	**1**	**2**	**3**	**4**	**5**
31.	I have a good word for everyone.	**1**	**2**	**3**	**4**	**5**
32.	I show my gratitude.	**1**	**2**	**3**	**4**	**5**
33.	I think of others first.	**1**	**2**	**3**	**4**	**5**
34.	I love to help others.	**1**	**2**	**3**	**4**	**5**
35.	I insult people.	**1**	**2**	**3**	**4**	**5**
36.	I am not interested in other people's problems.	**1**	**2**	**3**	**4**	**5**
37.	I feel little concern for others.	**1**	**2**	**3**	**4**	**5**
38.	I am not really interested in others.	**1**	**2**	**3**	**4**	**5**
39.	I am hard to get to know.	**1**	**2**	**3**	**4**	**5**
40.	I am indifferent to the feelings of others.	**1**	**2**	**3**	**4**	**5**
41.	I am always prepared.	**1**	**2**	**3**	**4**	**5**
42.	I pay attention to details.	**1**	**2**	**3**	**4**	**5**
43.	I get chores done right away.	**1**	**2**	**3**	**4**	**5**
44.	I like order.	**1**	**2**	**3**	**4**	**5**
45.	I follow a schedule.	**1**	**2**	**3**	**4**	**5**
46.	I am exacting in my work.	**1**	**2**	**3**	**4**	**5**

47.	I do things according to a plan.	**1**	**2**	**3**	**4**	**5**
48.	I continue until everything is perfect.	**1**	**2**	**3**	**4**	**5**
49.	I make plans and stick to them.	**1**	**2**	**3**	**4**	**5**
50.	I love order and regularity.	**1**	**2**	**3**	**4**	**5**
51.	I like to tidy up.	**1**	**2**	**3**	**4**	**5**
52.	I leave my belongings around.	**1**	**2**	**3**	**4**	**5**
53.	I make a mess of things.	**1**	**2**	**3**	**4**	**5**
54.	I often forget to put things back in their proper place.	**1**	**2**	**3**	**4**	**5**
55.	I shirk my duties.	**1**	**2**	**3**	**4**	**5**
56.	I neglect my duties.	**1**	**2**	**3**	**4**	**5**
57.	I waste my time.	**1**	**2**	**3**	**4**	**5**
58.	I do things in a half-way manner.	**1**	**2**	**3**	**4**	**5**
59.	I find it difficult to get down to work.	**1**	**2**	**3**	**4**	**5**
59.	I leave a mess in my room.	**1**	**2**	**3**	**4**	**5**
60.	I am relaxed most of the time.	**1**	**2**	**3**	**4**	**5**
61.	I seldom feel blue.	**1**	**2**	**3**	**4**	**5**
63.	I am not easily bothered by things.	**1**	**2**	**3**	**4**	**5**
64.	I rarely get irritated.	**1**	**2**	**3**	**4**	**5**
65.	I seldom get mad.	**1**	**2**	**3**	**4**	**5**
66.	I get stressed out easily.	**1**	**2**	**3**	**4**	**5**
67.	I worry about things.	**1**	**2**	**3**	**4**	**5**
68.	I am easily disturbed.	**1**	**2**	**3**	**4**	**5**
69.	I get upset easily.	**1**	**2**	**3**	**4**	**5**
70.	I change my mood a lot.	**1**	**2**	**3**	**4**	**5**
71.	I have frequent mood swings.	**1**	**2**	**3**	**4**	**5**
72.	I get irritated easily.	**1**	**2**	**3**	**4**	**5**
73.	I often feel blue.	**1**	**2**	**3**	**4**	**5**

74.	I get angry easily.	**1**	**2**	**3**	**4**	**5**
75.	I panic easily.	**1**	**2**	**3**	**4**	**5**
76.	I feel threatened easily.	**1**	**2**	**3**	**4**	**5**
77.	I get overwhelmed by emotions.	**1**	**2**	**3**	**4**	**5**
78.	I take offense easily.	**1**	**2**	**3**	**4**	**5**
79.	I get caught up in my problems.	**1**	**2**	**3**	**4**	**5**
80.	I grumble about things	**1**	**2**	**3**	**4**	**5**
81.	I have a rich vocabulary.	**1**	**2**	**3**	**4**	**5**
82.	I have a vivid imagination.	**1**	**2**	**3**	**4**	**5**
83.	I have excellent ideas.	**1**	**2**	**3**	**4**	**5**
84.	I am quick to understand things.	**1**	**2**	**3**	**4**	**5**
85.	I use difficult words.	**1**	**2**	**3**	**4**	**5**
86.	I spend time reflecting on things.	**1**	**2**	**3**	**4**	**5**
87.	I am full of ideas.	**1**	**2**	**3**	**4**	**5**
88.	I carry the conversation to a higher level.	**1**	**2**	**3**	**4**	**5**
89.	I catch on to things quickly.	**1**	**2**	**3**	**4**	**5**
90.	I can handle a lot of information.	**1**	**2**	**3**	**4**	**5**
91.	I love to think up new ways of doing things.	**1**	**2**	**3**	**4**	**5**
92.	I love to read challenging material.	**1**	**2**	**3**	**4**	**5**
93.	I am good at many things.	**1**	**2**	**3**	**4**	**5**
94.	I have difficulty understanding abstract ideas.	**1**	**2**	**3**	**4**	**5**
95.	I am not interested in abstract ideas.	**1**	**2**	**3**	**4**	**5**
96.	I do not have a good imagination.	**1**	**2**	**3**	**4**	**5**
97.	I try to avoid complex people.	**1**	**2**	**3**	**4**	**5**
98.	I have difficulty imagining things.	**1**	**2**	**3**	**4**	**5**
99.	I avoid difficult reading material.	**1**	**2**	**3**	**4**	**5**
100.	I will not probe deeply into a subject.	**1**	**2**	**3**	**4**	**5**

3.2 Five Factor Model (50-item version) (Goldberg et al., 2006)

On the following pages, there are phrases describing people's behaviours. Please use the rating scale below to describe how accurately each statement describes ***you***. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then circle the appropriate number.

Response Options

1: Very Inaccurate **2**: Moderately Inaccurate **3**: Neither Inaccurate nor Accurate
4: Moderately Accurate **5**: Very Accurate

1.	I am the life of the party	**1**	**2**	**3**	**4**	**5**
2.	I feel comfortable around other people	**1**	**2**	**3**	**4**	**5**
3.	I start conversations	**1**	**2**	**3**	**4**	**5**
4.	I talk to a lot of different people at parties	**1**	**2**	**3**	**4**	**5**
5.	I don't mind being the centre of attention	**1**	**2**	**3**	**4**	**5**
6.	I don't talk a lot	**1**	**2**	**3**	**4**	**5**
7.	I keep in the background	**1**	**2**	**3**	**4**	**5**
8.	I have little to say	**1**	**2**	**3**	**4**	**5**
9.	I don't like to draw attention to myself	**1**	**2**	**3**	**4**	**5**
10.	I am quiet around strangers	**1**	**2**	**3**	**4**	**5**
11.	I am interested in people	**1**	**2**	**3**	**4**	**5**
12.	I sympathise with others' feelings	**1**	**2**	**3**	**4**	**5**
13.	I have a soft heart	**1**	**2**	**3**	**4**	**5**
14.	I take time out for others	**1**	**2**	**3**	**4**	**5**
15.	I feel others' emotions	**1**	**2**	**3**	**4**	**5**
16.	I make people feel at ease	**1**	**2**	**3**	**4**	**5**
17.	I am not really interested in others	**1**	**2**	**3**	**4**	**5**
18.	I insult people	**1**	**2**	**3**	**4**	**5**
19.	I am not interested in other peoples' problems	**1**	**2**	**3**	**4**	**5**

20.	I feel little concern for others	**1**	**2**	**3**	**4**	**5**
21.	I am always prepared	**1**	**2**	**3**	**4**	**5**
22.	I pay attention to details	**1**	**2**	**3**	**4**	**5**
23.	I get chores done right away	**1**	**2**	**3**	**4**	**5**
24.	I like order	**1**	**2**	**3**	**4**	**5**
25.	I follow a schedule	**1**	**2**	**3**	**4**	**5**
26.	I am exacting in my work	**1**	**2**	**3**	**4**	**5**
27.	I leave my belongings around	**1**	**2**	**3**	**4**	**5**
28.	I make a mess of things	**1**	**2**	**3**	**4**	**5**
29.	I often forget to put things back in their proper place	**1**	**2**	**3**	**4**	**5**
30.	I shirk my duties	**1**	**2**	**3**	**4**	**5**
31.	I am relaxed most of the time	**1**	**2**	**3**	**4**	**5**
32.	I seldom feel blue	**1**	**2**	**3**	**4**	**5**
33.	I get stressed out easily	**1**	**2**	**3**	**4**	**5**
34.	I worry about things	**1**	**2**	**3**	**4**	**5**
35.	I am easily disturbed	**1**	**2**	**3**	**4**	**5**
36.	I get upset easily	**1**	**2**	**3**	**4**	**5**
37.	I change my mood a lot	**1**	**2**	**3**	**4**	**5**
38.	I have frequent mood swings	**1**	**2**	**3**	**4**	**5**
39.	I get irritated easily	**1**	**2**	**3**	**4**	**5**
40.	I often feel blue	**1**	**2**	**3**	**4**	**5**
41.	I have a rich vocabulary	**1**	**2**	**3**	**4**	**5**
42.	I have a vivid imagination	**1**	**2**	**3**	**4**	**5**
43.	I have excellent ideas	**1**	**2**	**3**	**4**	**5**
44.	I am quick to understand things	**1**	**2**	**3**	**4**	**5**
45.	I use difficult words	**1**	**2**	**3**	**4**	**5**

46.	I spend time reflecting on things	**1**	**2**	**3**	**4**	**5**
47.	I am full of ideas	**1**	**2**	**3**	**4**	**5**
48.	I have difficulty understanding abstract ideas	**1**	**2**	**3**	**4**	**5**
49.	I am not interested in abstract ideas	**1**	**2**	**3**	**4**	**5**
50.	I do not have a good imagination	**1**	**2**	**3**	**4**	**5**

3.3: The General Self-efficacy Scale (Schwarzer & Jerusalem, 1995)

The following statements deal with reactions you may have to various situations. Indicate how true each of these statements is depending on how you feel about the situation by selecting the most appropriate answer.

		Not At All True	Hardly True	Moderately True	Exactly True
1.	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2.	If someone opposes me, I can find the means and ways to get what I want.	1	2	3	4
3.	It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
4.	I am confident that I could deal efficiently with unexpected events.	1	2	3	4
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
6.	I can solve most problems if I invest the necessary effort.	1	2	3	4
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
8.	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
9.	If I am in trouble, I can usually think of a solution.	1	2	3	4
10.	I can usually handle whatever comes my way.	1	2	3	4

3.4: The Academic Self-efficacy Scale (McIlroy & Bunting, 2002).

Please encircle that number below that most accurate describes your response to each statement, according to the following code:

1	2	3	4	5	6	7
Very Strongly Agree	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Very Strongly Disagree**

1. I am confident that I can achieve good exam results if I really put my mind to it.
   1 2 3 4 5 6 7

2. If I don't understand an academic problem, I persevere until I do. 1 2 3 4 5 6 7

3. When I hear of others who have failed their exams, this makes me all the more determined to succeed.
   1 2 3 4 5 6 7

4. I am confident that I will be adequately prepared for the exams by the time they come around.
   1 2 3 4 5 6 7

5. I tend to put off trying to master difficult academic problems whenever they arise.
   1 2 3 4 5 6 7

6. No matter how hard I try, I can't seem to come to terms with many of the issues in my academic curriculum.
   1 2 3 4 5 6 7

7. I am convinced that I will eventually master those items on my academic course which I do not currently understand. 1 2 3 4 5 6 7

8. I expect to give a good account of myself in my end-of-semester exams.
   1 2 3 4 5 6 7

9. I fear that I may do poorly in my end-of-semester exams.
   1 2 3 4 5 6 7

10. I have no serious doubts about my own ability to perform successfully in my exams.
    1 2 3 4 5 6 7

3.5: The Academic Conscientiousness Scale (McIlroy & Bunting, 2002)

Please encircle that number below that most accurate describes your response to each statement, according to the following code:

1	2	3	4	5	6	7
Very Strongly Agree	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Very Strongly Disagree**

1. I go to work on my assignments immediately after learning what the titles are. 1 2 3 4 5 6 7
2. I always plan my study time as a top priority 1 2 3 4 5 6 7
3. I never lag behind other students in my application to study. 1 2 3 4 5 6 7
4. I have a well-established pattern of regular and consistent study. 1 2 3 4 5 6 7
5. No matter how good my intentions are, I usually end up leaving revision until near exam time. 1 2 3 4 5 6 7
6. I normally try to consolidate what I have learned as soon as possible after lectures. 1 2 3 4 5 6 7
7. If I miss out on study time, I immediately apply myself to making up the lost time. 1 2 3 4 5 6 7
8. I have always made every effort to attend all lectures/seminars/tutorials/practicals. 1 2 3 4 5 6 7
9. I seldom work as hard at my studies as I intend 1 2 3 4 5 6 7
10. I can see vast room for improvement in my application to academic study. 1 2 3 4 5 6 7

3.6: The Test Anxiety Scale (Benson & El-Zahhar, 1994)

The following statements refer to how you feel when you take an exam. Use the scale below to rate items 1 through to 20 in terms of how you feel when taking exams in general. Please respond to all items, and encircle the number that most applies to you according to the following code:

1 = Strongly Agree. 2 = Agree. 3 = Slightly Agree. 4 = Neutral. 5= Slightly Disagree.

6 = Disagree. 7 = Strongly Disagree.

1. Thinking about my grade in a course interferes with my work on exams.	1 2 3 4 5 6 7
2. I seem to defeat myself while taking important exams.	1 2 3 4 5 6 7
3. During exams I find myself thinking about the consequences of failing.	1 2 3 4 5 6 7
4. While taking exams, I find myself thinking how much brighter other people are.	1 2 3 4 5 6 7
5. While taking an exam, I often think about how difficult it is.	1 2 3 4 5 6 7
6. During an exam I think about how much I should have prepared.	1 2 3 4 5 6 7
7. I start feeling very uneasy just before getting an exam result.	1 2 3 4 5 6 7
8. During exams I feel very tense.	1 2 3 4 5 6 7
9. I worry a great deal before taking an important exam.	1 2 3 4 5 6 7
10. I am anxious about exams.	1 2 3 4 5 6 7
11. I worry before an exam because I do not know what to expect.	1 2 3 4 5 6 7
12. I get a headache during an important exam.	1 2 3 4 5 6 7
13. My mouth feels dry during an exam.	1 2 3 4 5 6 7
14. I sometimes find myself trembling before or during exams.	1 2 3 4 5 6 7
15. While taking an exam my muscles are very tight.	1 2 3 4 5 6 7
16. I have difficulty breathing while taking an exam.	1 2 3 4 5 6 7
17. During exams I find myself thinking about things unrelated to the material being tested.	1 2 3 4 5 6 7
18. I think about current events during an exam.	1 2 3 4 5 6 7
19. While taking exams, I sometimes think about being somewhere else.	1 2 3 4 5 6 7
20. During exams, I find I am distracted by thoughts of upcoming events.	1 2 3 4 5 6 7

3.7: The Assessing Emotions Scale (Schutte et al., 1998)

Directions: Each of the following items asks you about your emotions or reactions associated with emotions. After deciding whether a statement is generally true for you, use the 5-point scale to respond to the statement. Please circle the response that best describes you for each item.

1 = strongly disagree 2 = somewhat disagree 3 = neither agree nor disagree

4 = somewhat agree 5 = strongly agree

1.	I know when to speak about my personal problems to others……..	1 2 3 4 5
2.	When I am faced with obstacles, I remember times I faced similar obstacles and overcame them……..	1 2 3 4 5
3.	I expect that I will do well on most things I try…….	1 2 3 4 5
4.	Other people find it easy to confide in me……	1 2 3 4 5
5.	I find it hard to understand the non-verbal messages of other people.....	1 2 3 4 5
6.	Some of the major events of my life have led me to re-evaluate what is important and not important……..……..	1 2 3 4 5
7.	When my mood changes, I see new possibilities……	1 2 3 4 5
8.	Emotions are one of the things that make my life worth living……..	1 2 3 4 5
9.	I am aware of my emotions as I experience them……..	1 2 3 4 5
10.	I expect good things to happen…….	1 2 3 4 5
11.	I like to share my emotions with others…….……..	1 2 3 4 5
12.	When I experience a positive emotion, I know how to make it last…….	1 2 3 4 5
13.	I arrange events others enjoy……..…….	1 2 3 4 5
14.	I seek out activities that make me happy…….	1 2 3 4 5
15.	I am aware of the non-verbal messages I send to others…….….	1 2 3 4 5
16.	I present myself in a way that makes a good impression on others…….	1 2 3 4 5
17.	When I am in a positive mood, solving problems is easy for me…….	1 2 3 4 5
18.	By looking at their facial expressions, I recognize the emotions people are experiencing……..	1 2 3 4 5
19.	I know why my emotions change…….…….	1 2 3 4 5
20.	When I am in a positive mood, I am able to come up with new ideas…..	1 2 3 4 5

21.	I have control over my emotions…….	1 2 3 4 5
22.	I easily recognize my emotions as I experience them……..	1 2 3 4 5
23.	I motivate myself by imagining a good outcome to tasks I take on…….	1 2 3 4 5
24.	I compliment others when they have done something well……..	1 2 3 4 5
25.	I am aware of the non-verbal messages other people send…….	1 2 3 4 5
26.	When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself……..	1 2 3 4 5
27.	When I feel a change in emotions, I tend to come up with new ideas….	1 2 3 4 5
28.	When I am faced with a challenge, I give up because I believe I will fail.	1 2 3 4 5
29.	I know what other people are feeling just by looking at them…….	1 2 3 4 5
30.	I help other people feel better when they are down……..…..	1 2 3 4 5
31.	I use good moods to help myself keep trying in the face of obstacles….	1 2 3 4 5
32.	I can tell how people are feeling by listening to the tone of their voice…	1 2 3 4 5
33.	It is difficult for me to understand why people feel the way they do…….	1 2 3 4 5

3.8. The Trait Emotional Intelligence Questionnaire (TEIQ) (Petrides et al., 2006)

Instructions: Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. Do not think too long about the exact meaning of the statements. Work quickly and try to answer as accurately as possible. There are no right or wrong answers. There are seven possible responses to each statement ranging from 'Completely Disagree' (number 1) to 'Completely Agree' (number 7).

1		**2**	**3**	**4**	**5**	**6**		**7**					
Completely Disagree								**Completely Agree**					
1.	Expressing my emotions with words is not a problem for me		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
2.	I often find it difficult to see things from another person's viewpoint		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
3.	On the whole, I'm a highly motivated person		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
4.	I usually find it difficult to regulate my emotions		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
5.	I generally don't find life enjoyable		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
6.	I can deal effectively with people		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
7.	I tend to change my mind frequently		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
8.	Many times, I can't figure out what emotion I'm feeling		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
9.	I feel that I have a number of good qualities		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
10.	I often find it difficult to stand up for my rights		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
11.	I'm usually able to influence the way other people feel		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
12.	On the whole, I have a gloomy perspective on most things		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
13.	Those close to me often complain that I don't treat them right		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
14.	I often find it difficult to adjust my life according to the circumstances		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
15.	On the whole, I'm able to deal with stress		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
16.	I often find it difficult to show my affection to those close to me		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
17.	I'm normally able to "get into someone's shoes" and experience their emotions		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
18.	I normally find it difficult to keep myself motivated		**1**	**2**	**3**	**4**	**5**	**6**	**7**				
19.	I'm usually able to find ways to control my emotions when I want to		**1**	**2**	**3**	**4**	**5**	**6**	**7**				

20.	On the whole, I'm pleased with my life	**1**	**2**	**3**	**4**	**5**	**6**	**7**
21.	I would describe myself as a good negotiator	**1**	**2**	**3**	**4**	**5**	**6**	**7**
22.	I tend to get involved in things I later wish I could get out of	**1**	**2**	**3**	**4**	**5**	**6**	**7**
23.	I often pause and think about my feelings	**1**	**2**	**3**	**4**	**5**	**6**	**7**
24.	I believe I'm full of personal strengths	**1**	**2**	**3**	**4**	**5**	**6**	**7**
25.	I tend to "back down" even if I know I'm right	**1**	**2**	**3**	**4**	**5**	**6**	**7**
26.	I don't seem to have any power at all over other people's feelings	**1**	**2**	**3**	**4**	**5**	**6**	**7**
27.	I generally believe that things will work out fine in my life	**1**	**2**	**3**	**4**	**5**	**6**	**7**
28.	I find it difficult to bond well even with those close to me	**1**	**2**	**3**	**4**	**5**	**6**	**7**
29.	Generally, I'm able to adapt to new environments	**1**	**2**	**3**	**4**	**5**	**6**	**7**
30.	Others admire me for being relaxed	**1**	**2**	**3**	**4**	**5**	**6**	**7**

3.9: The Trait Meta-Mood Scale (TMMS) (Salovey & Mayer & Goldman et al., 1995).

Using the rating scale below, please rate the strength of your agreement/disagreement to the following statements.

1 = Strongly disagree 2 = Somewhat disagree 3 = Neither agree or disagree 4 = Somewhat agree

5 = Strongly agree

Number	Statement	
1	I try to think good thoughts no matter how badly I feel	
2*	People would be better off if they felt less and thought more	
3*	I don't think it's worth paying attention to your emotions or moods	
4*	I don't usually care much about what I am feeling	
5*	Sometimes I can't tell what my feelings are	
6	I am rarely confused about how I feel	
7	Feelings give direction to life	
8	Although I am sometimes sad, I have a mostly optimistic outlook	
9*	When I am upset I realise that the "good things in life" are illusions	
10	I can't believe in acting from the heart	
11*	I can never tell how I feel	
12	The best way to handle my feelings is to experience them to their fullest	
13	When I am upset I remind myself of all the pleasures from life	
14*	My beliefs and opinions always seem to change depending on how I feel	
15	I am aware of my feelings on a matter	
16*	I am usually confused about how I feel	
17*	One should never be guided by emotions	
18*	I never give into my emotions	
19*	Although I am sometimes happy, I have a mostly pessimistic outlook	
20	I feel at ease with my emotions	

21	I often pay attention to how I feel	
22*	I can't make sense out of my feelings	
23*	I don't pay much attention to my feelings	
24	I often think about my feelings	
25	I am usually very clear about my feelings	
26	No matter how badly I feel, I try to think about pleasant things	
27*	Feelings are a weakness humans have	
28	I usually know my feelings about a matter	
29*	It is usually a waste of time to think about your emotions	
30	I almost always know exactly how I am feeling	

3.10: The Emotional Self-efficacy Scale (Kirk et al., 2008).

Using the rating scale below please read each statement and rate your confidence in performing each function/how confident you are that you can perform each function.

1 = Not at all confident 2 = Somewhat unconfident 3 = Neither confident nor unconfident 4 = Somewhat confident 5 = Very confident

Number	Statement	Response
1	Understand what causes your emotions to change	
2	Correctly identify your own positive emotions	
3	Know what causes you to feel a negative emotion	
4	Realise what causes another person to feel a negative emotion	
5	Realise what causes another person to feel a positive emotion	
6	Correctly identify when another person is feeling a positive emotion	
7	Figure out what causes another person's differing emotions	
8	Use positive emotions to generate good ideas	
9	Recognise what emotion is being communicated through your facial expression	
10	Notice the emotion your body language is portraying	
11	Generate the right emotion so that creative ideas can unfold	
12	Notice the emotion another person's body language is portraying	
13	Change your negative emotion to a positive emotion	
14	Figure out what causes you to feel differing emotions	
15	Understand what causes another person's emotions to change	
16	Help another person to regulate emotions when under pressure	
17	Correctly identify your own negative emotions	
18	Know what causes you to feel a positive emotion	
19	Help another person calm down when he or she is feeling angry	
20	Correctly identify when another person is feeling a negative emotion	

21	Get into a mood that best suits the occasion	
22	Create emotions to enhance cognitive performance	
23	Regulate your own emotions when close to reaching a goal	
24	Create a positive emotion when feeling a negative emotion	
25	Use positive emotions to generate novel solutions to old problems	
26	Recognize what emotion another person is communicating through his or her facial expression	
27	Create emotions to enhance physical performance	
28	Help another person change a negative emotion to a positive emotion	
29	Calm down when feeling angry	
30	Regulate your own emotions when under pressure	
31	Help another person regulate emotions after he or she has suffered a loss	
32	Generate in yourself the emotion another person is feeling	

3.11: The Adult Trait Hope Scale (Snyder et al., 1991).

Directions: Read each item carefully. Using the scale shown below, please circle the number next to each item that best describes YOU.

1	2	3	4	5	6	7	8
Definitely False	Mostly False	Somewhat False	Slightly False	Slightly True	Somewhat True	Mostly True	Definitely True

1. I can think of many ways to get out of a jam 1 2 3 4 5 6 7 8
2. I energetically pursue my goals 1 2 3 4 5 6 7 8
3. I feel tired most of the time 1 2 3 4 5 6 7 8
4. There are lots of ways around any problem 1 2 3 4 5 6 7 8
5. I am easily downed in an argument 1 2 3 4 5 6 7 8
6. I can think of many ways to get the things in life that are most important to me 1 2 3 4 5 6 7 8
7. I worry about my health 1 2 3 4 5 6 7 8
8. Even when others get discouraged, I know I can find a way to solve the problem 1 2 3 4 5 6 7 8
9. My past experiences have prepared me for my future 1 2 3 4 5 6 7 8
10. I've been pretty successful in life 1 2 3 4 5 6 7 8
11. I usually find myself worrying about something 1 2 3 4 5 6 7 8
12. I meet the goals that I set for myself 1 2 3 4 5 6 7 8

3.12 The Satisfaction with Life Scale (Diener et al., 1985)

DIRECTIONS: Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by placing the appropriate number in the box following that item. Please be open and honest in your responding.

1 = Strongly Disagree 2 = Disagree 3 = Slightly Disagree

4 = Neither Agree or Disagree 5 = Slightly Agree 6 = Agree 7 = Strongly Agree

1. In most ways my life is close to my ideal. ☐

2. The conditions of my life are excellent. ☐

3. I am satisfied with life. ☐

4. So far I have gotten the important things I want in life. ☐

5. If I could live my life over, I would change almost nothing. ☐

3.13 The Life Orientation Test (LOT) (Scheier et al., 1994).

Please be as honest and accurate as you can be throughout. Try not to let your response to one statement influence your responses to other statements. There are no "correct" or "incorrect answers. Answer according to your own feelings rather than how you think "most people" would answer. Using the scale below, write the appropriate letter in the box beside each statement.

A	B	C	D	E
I agree a lot	I agree a little	I neither agree or disagree	I disagree a little	I disagree a lot

1.	In uncertain times, I usually expect the best	A	B	C	D	E
2.	It's easy for me to relax	A	B	C	D	E
3.	If something **can** go wrong for me, it **will**.	A	B	C	D	E
4.	I always look on the bright side.	A	B	C	D	E
5.	I'm always optimistic about my future.	A	B	C	D	E
6.	I enjoy my friends a lot..	A	B	C	D	E
7.	It's important for me to keep busy	A	B	C	D	E
8.	I hardly ever expect things to go my way.	A	B	C	D	E
9.	Things never work out the way I want them to.	A	B	C	D	E
10.	I don't get easily upset.	A	B	C	D	E
11.	I am a believer in the idea that 'every cloud has a silver lining'.	A	B	C	D	E
12.	I rarely count on good things happening to me.	A	B	C	D	E

3.14: The Health Self-efficacy (Perceived Health Competency) Scale (Smith et al., 1995)

Below are eight statements that you may agree or disagree with. Using the 1 – 5 scale below, indicate your agreement with each item by circling the appropriate number next to each item.

1= Strongly Disagree
2=Disagree
3=Neither agree nor disagree
4=Agree
5=Strongly Agree

1. I handle myself well with respect to my health.	1	2	3	4	5
2. No matter how hard I try, my health just doesn't turn out the way I would like.	1	2	3	4	5
3. It is difficult for me to find effective solutions to the health problems that come my way.	1	2	3	4	5
4. I succeed in the projects I undertake to improve my health	1	2	3	4	5
5. I'm generally able to accomplish my goals with respect to my health.	1	2	3	4	5
6. I find my efforts to change things I don't like about my health are ineffective.	1	2	3	4	5
7. Typically, my plans for my health don't work out well.	1	2	3	4	5
8. I am able to do things for my health as well as most other people	1	2	3	4	5

3.15: The General Health Questionnaire (12-items) (GHQ 12) (Goldberg, 1978)

Please read this carefully.
We should like to know if you have had any medical complaints and how your health has been in general, *over the last few weeks*. Please answer all questions simply by **circling** the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those that you had in the past.

It is important that you try to answer ALL the questions.
Thank you for your co-operation.

Have you recently…

1	..been able to concentrate on whatever you are doing?	**Better than usual**	**Same as usual**	**Less than usual**	**Much less than usual**
2	..lost much sleep over worry?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
3	..felt that you were playing a useful part in things?	**More so than usual**	**Same as usual**	**Less than usual**	**Much less useful**
4	..felt capable of making decisions about things?	**More so than usual**	**Same as usual**	**Less than usual**	**Much less capable**
5	..felt constantly under strain?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
6	..felt you couldn't overcome your difficulties?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
7	..been able to enjoy your normal day-to day activities	**More so than usual**	**Same as usual**	**Less than usual**	**Much less than usual**
8	..been able to face up to your problems	**More so than usual**	**Same as usual**	**Less than usual**	**Much less able**
9	..been feeling unhappy and depressed?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
10	..been losing confidence in yourself?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
11	..been thinking of yourself as a worthless person?	**Not at all**	**No more than usual**	**Rather more than usual**	**Much more than usual**
12	..been feeling reasonably happy, all things considered?	**More so than usual**	**Same as usual**	**Less than usual**	**Much less than usual**

3.16: The Positive and Negative Affect Scale - Trait (PANAS-T)

This scale consists of a number of words that describe different feelings and emotions. Read each word and then mark the appropriate number in the space next to that word. Indicate to what extent you **feel this way in general**. Use the following scale to record your answers.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

interested	___	Irritable	___
distressed	___	alert	___
excited	___	ashamed	___
upset	___	inspired	___
strong	___	nervous	___
guilty	___	determined	___
scared	___	attentive	___
hostile	___	jittery	___
enthusiastic	___	active	___
Proud	___	afraid	___
hostile	___	jittery	___
enthusiastic	___	active	___
Proud	___	afraid	___

3.17: The Hospital Anxiety and Depression Scale

HADS

Please read each item and place a **tick** in the box which comes closest to
how you have been feeling in the past week.
Don't take too long over your replies: your immediate reaction to each question will probably be more accurate than a long thought out response.

1) I feel tense or wound up:

- Most of the time ☐ 1
- A lot of the time ☐ 2
- Time to time, occasionally ☐ 3
- Not at all ☐ 4

2) I feel as if I am slowed down:

- Nearly all the time ☐ 1
- Very often ☐ 2
- Sometimes ☐ 3
- Not at all ☐ 4

3) I still enjoy the things I used to enjoy:

- Definitely as much ☐ 1
- Not quite as much ☐ 2
- Only a little ☐ 3
- Hardly at all ☐ 4

4) I get a sort of frightened feeling like butterflies in the stomach:

- Not at all ☐ 1
- Occasionally ☐ 2
- Quite often ☐ 3
- Very often ☐ 4

5) I get a sort of frightened feeling as if something awful is going to happen:

- Very definitely and quite badly ☐ 1
- Yes, but not too badly ☐ 2
- A little, but it doesn't worry me ☐ 3
- Not at all ☐ 4

6) I have lost interest in my appearance:

- Definitely ☐ 1
- I don't take so much care as I should ☐ 2
- I may not take as quite as much care ☐ 3
- I take just as much care as ever ☐ 4

7) I can laugh and see the funny side of things:

- As much as I always could ☐ 1
- Not quite so much now ☐ 2

8) I feel restless as if I have to be on the move:

- Very much indeed ☐ 1
- Not very much ☐ 2

Definitely not so much now ☐3

Not at all ☐4

Quite a lot ☐3

Not at all ☐4

9) Worrying thoughts go through my mind:

A great deal of the time ☐1

A lot of the time ☐2

From time to time, not to often ☐3

Only occasionally ☐4

10) I look forward with enjoyment to things:

As much as I ever did ☐1

Rather less than I used to ☐2

Definitely less than I used to ☐3

Hardly at all ☐4

11) I feel cheerful:

Not at all ☐1

Not often ☐2

Sometimes ☐3

Most of the time ☐4

12) I get sudden feelings of panic:

Very often indeed ☐1

Quite often ☐2

Not very often ☐3

Not at all ☐4

13) I can sit at ease and feel relaxed:

Definitely ☐1

Usually ☐2

Not often ☐3

Not at all ☐4

14) I can enjoy a good book, radio or TV programme:

Often ☐1

Sometimes ☐2

Not often ☐3

Very seldom ☐4

3.18: The Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989).

PITTSBURGH SLEEP QUALITY INDEX

INSTRUCTIONS:

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month.

Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?
BED TIME _____
2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?
NUMBER OF MINUTES _____
3. During the past month, what time have you usually gotten up in the morning?
GETTING UP TIME _____
4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)
HOURS OF SLEEP PER NIGHT _____

For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you had trouble sleeping because you . . .
a) Cannot get to sleep within 30 minutes
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
b) Wake up in the middle of the night or early morning
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
c) Have to get up to use the bathroom
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
d) Cannot breathe comfortably
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
e) Cough or snore loudly
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
f) Feel too cold
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
g) Feel too hot
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
h) Had bad dreams
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
i) Have pain
Not during the Less than Once or twice Three or more
past month_____ once a week_____ a week_____ times a week_____
j) Other reason(s), please describe_____
_____

How often during the past month have you had trouble sleeping because of this?
Not during the past month_____ Less than once a week_____ Once or twice a week_____ Three or more times a week_____
6. During the past month, how would you rate your sleep quality overall?
Very good _____
Fairly good _____
Fairly bad _____
Very bad _____
Page 3 of 4
7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?
Not during the past month_____ Less than once a week_____ Once or twice a week_____ Three or more times a week_____
8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?
Not during the past month_____ Less than once a week_____ Once or twice a week_____ Three or more times a week_____
9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?
No problem at all _____
Only a very slight problem _____
Somewhat of a problem _____
A very big problem _____
10. Do you have a bed partner or room-mate?
No bed partner or room mate _____
Partner/room-mate in other room _____
Partner in same room, but not same bed _____
Partner in same bed _____

3.19: Sleep Diary (a form was provided for each day of each trial).

Sleep Diary – to be kept by your bed and completed when you wake up

Date…….. Participant no……Age……..Gender……..

1. What time did you go to bed last night? ……
2. What time did you attempt to sleep (turn the lights out)? ……
3. How many minutes did it take you to fall asleep? ……
4. What time do you finally wake up (for the last time this morning)? …….
5. Were you woken by? (Please tick) Alarm …….

   Someone you asked to wake you….

   Noise……

   Woke naturally ……...
6. After falling asleep how many times did you wake in the night? (please circle)

   0 1 2 3 4 5 more
7. Total minutes awake? ……
8. What did you wake up for? (please circle number of times).

Bathroom:	0	1	2	3	4	5	more
Noise/child partner:	0	1	2	3	4	5	more
Physical discomfort:	0	1	2	3	4	5	more
Toilet:	0	1	2	3	4	5	more
Just woke:	0	1	2	3	4	5	more

9. Ratings (place a mark somewhere along each line):

Sleep quality:	very bad ……..	very good
Mood when woke up	very tense ……	very calm
Alertness when woke up	very sleepy ……..	very alert

Appendix 4: Correlations between the FFM and AP for level 4 Chapter 1 (chapter 1).

	Extraversion	Agreeableness	Conscientiousness	Emotional Stability	Openness
RM CW1	.04	-.06	.00	-.07	.03
RM CW2	-.07	-.01	-.07	-.07	-.04
RM exam	-.04	-.05	-.12	-.06	-.04
RM AV	.01	-.02	-.03	-.06	.03
DEV CW1	-.04	.02	.05	.01	.04
DEV CW2	.02	.04	-.05	.15	-.00
DEV exam	-.07	-.02	.07	-.13	.02
DEV AV	-.06	-.00	-.06	-.03	.03
LCB CW1	.03	.06	-.07	-.07	.01
LCB CW2	-.05	.04	-.12	-.06	.07
LCB exam	-.10	-.09	.08	-.12	-.02
LCB AV	-.02	.00	.03	-.15	-.00
CONC CW	-.06	.13	.10	-.14	.10
CONC exam	.03	.00	.03	-.02	.05
CONC AV	.03	.02	.12	-.07	.09

Key: RMCW1 = Research Methods Coursework 1 RMCW2 = Research Methods Coursework 2 RM Exam = Research Methods Coursework exam RM AV = Research Methods average module mark DEV CW1 = Developmental & Social Psychology Coursework 1 DEV CW2 = Developmental & Social Psychology Coursework 2 DEV Exam = Developmental & Social Psychology Exam DEV AV = Developmental & Social Psychology average module mark LBC CW1 = Learning, Cognitive and Biological Psychology Coursework LBC CW2 = Learning, Cognitive and Biological Psychology Coursework 2 LBC exam = Learning, Cognitive and Biological Psychology exam LBC AV = Learning, Cognitive and Biological Psychology average module mark CONC CW = Conceptual Issues in Psychology Coursework CONC exam = Conceptual Issues in Psychology exam CONC AV = Conceptual Issues in Psychology average module mark.

Appendix 5: Tables from chapter 4

5.1 Table 4.8: Correlations between WB and AP for the L4 cohort

	RMI	DEV SOC	LCB PSY	CON ISS	RM11	BCD	SPID	ABN PSY	PSY APP	AV4	AV5	Hope	SWL	LOT	GHQ	PA	NA	ANX	DEP
DEV SOC	.63**																		
LCB	.57**	.55**																	
CON	.49**	.54	.59**																
RMII	.67**	.60**	.57**	.54**															
BCD	.58**	.85**	.57**	.54**	.63**														
SPID	.58**	.48**	.62**	.50**	.63**	.61**													
ABN	.59**	.60**	.62**	.48**	.57**	.44**	.53**												
APP	.40**	.35**	.41**	.39**	.53**	.46**	.48**	.34**											
AV4	.83**	.84**	.83**	.78**	.73**	.66**	.66**	.69**	.48**										
AV5	.69**	.63**	.69**	.62**	.86**	.79**	.80**	.69**	.77**	.80**									
Hope	.06	.17**	.07	.08	.12	.04	.11	.03	.08	.1	.10								
SWL	.07	.12	.12	.03	.08	.01	.04	.08	-.05	.08	.03	.602**							
LOT	-.05	-.13	-.09	-.07	-.08	.00	-.03	-.10	-.07	-.10	-.07	-.51**	-.54**						
GHQ	.06	-.01	-.03	.03	.06	.01	.07	-.02	-.02	.02	.03	-.25**	-.41**	.49**					
PA	.09	.08	.02	.05	.10	.03	.17*	.07	.06	.06	.11	.48**	.36**	-.29**	-.13				
NA	.19*	.17*	.07	.15	.18*	.15	.18*	.18*	.11	-.16	.20*	.01	-.08	.15	.38**	.59**			
ANX	-.01	.01	.06	.03	-.00	.00	.05	.01	-.01	-.01	.01	-.16	-.32**	.46**	.53**	.05	.49**		
DEP	-.01	-.00	-.14	-.06	-.04	-.05	-.05	.01	-.02	-.06	-.02	-.40**	-.57**	.46**	.58**	-.12	.36**	.54**	
HSE	.03	.10	.14	.03	.08	.02	.01	.04	-.06	.08	.03	.24**	.40	-.44**	-.39**	.17*	-.23**	-.37**	.39**

5.2 Table 4.9: Correlations between wellbeing and level 4 academic performance (L5 cohort)

	INTRO PSY	SOC PSY	HM PSY	DEV PSY	L & Cog	INTRO RM I	AV4	HOPE	SWL	LOT	GHQ	PA	NA	ANX	DEP
SOC	.11														
HMPSY	.32**	.16*													
DEVPSY	.10	.07	.31**												
L & C	.40**	.23**	.42**	.17*											
RMI	.25**	.16*	.19**	.33**	.30**										
AV4	.49**	.37**	.61**	.56**	.73**	.56**									
AV5	.00	.17*	.07	.11	-.01	.06	.09								
HOPE	-.08	.12	-.01	.05	-.00	.03	.02	.43**							
SWL	-.10	-.12	-.20**	-.07	-.15*	-.13	-.17*	-.52**	-.53**						
LOT	.12	-.11	-.06	-.01	-.03	-.09	-.03	-.24**	-.47**	.42**					
GHQ	-.06	.14*	.01	.02	-.01	.01	.00	.54**	.37**	-.43**	.37**				
PA	.04	.03	-.04	.00	-.08	-.10	-.12	.02	-.18*	.16*	.44**	.20**			
NA	-.01	-.09	-.09	.03	-.14*	-.12	-.13	-.12	-.36**	.42**	.67**	-.20**	.59**		
DEP	.00	-.12	-.06	-.01	-.06	-.07	-.09	-.24**	-.50**	.46**	.58**	-.30**	.34**	.55**	
HSE	-.01	-.09	.07	.06	.03	.11	.06	.14*	.27**	-.22**	-.27**	.24**	.17**	.32**	-.28**

5.3 Table 4.10: Correlations between wellbeing and AP level 5 academic performance (L5 cohort)

	RMIIa	RMII b	RMII E	RMII AV	BCDa	BCD b	BCD E	BCD AV	SPID a	SPID E	SPID AV	ABN a	ABN b	ABN E	ABN AV	APP Av	L5 AV	HOPE	SWL	LOT	GHQ	PA	NA	ANX	DEP
RMIIb	.48**																								
RMIIE	.43**	.41**																							
RMIIt	.70**	.71**	.70**																						
BCDa	.32**	.43**	.32**	.23**																					
BCDb	.45**	.38**	.34**	.30**	.42**																				
BCDE	.31**	.29**	.48**	.30**	.30**	.38**																			
BCDt	.28**	.30*	.42**	.45**	.48**	.56**	.72**																		
SPIDa	.21**	.21**	.24**	.32**	.22**	.17**	.12	.28**																	
SPIDE	.339**	.19**	.18*	.24**	.29**	.28**	.36**	.39**	.11																
SPIDt	.43**	.23**	.22**	.39**	.27**	.24**	.28**	.40**	.67**	.72**															
ABNa	.31**	.23**	.30**	.34**	.14**	.30**	.26**	.30**	.11	.20**	.20**														
ABNb	.21**	.25**	.24**	.29**	.28**	.16*	.12	.24**	.28**	.13	.22**	.15*													
ABNE	.23**	.16*	.20**	.25**	.18**	.41**	.15*	.32**	.20**	.18**	.24**	.28**	.33**												
ABNt	.41**	.32**	.41**	.47**	.27**	.44**	.31**	.45**	.28**	.29**	.35**	.71**	.55**	.71**											
APPt	.31**	.33**	.33**	.42**	.25**	.42**	.29**	.43**	.32**	.30**	.36**	.40**	.22**	.40**	.53**										
AV5	.36**	.36**	.54**	.55**	.39**	.44**	.40**	.65**	.47**	.38**	.53**	.42**	.36**	.38**	.62**	.68**									
HOPE	-.08	.03	.15*	.05	.01	-.09	.06	.00	.04	-.00	-.00	.09	.06	-.04	.06	.00	.02								
SWL	-.01	.04	.03	.05	-.02	-.03	.01	.07	.08	.03	.09	.06	.05	-.02	.06	-.02	.04	.43**							
LOT	-.09	-.12	-.17*	-.11	-.10	-.06	-.12	-.09	-.11	-.02	-.07	.09	-.02	.00	-.08	.00	-.04	-.52**	-.53**						
GHQ	.00	-.01	-.03	-.02	-.03	.05	.02	-.10	-.09	.08	-.01	-.05	-.02	.09	.03	.05	.02	-.24**	-.47**	.42**					
PA	-.02	.07	.10	.07	-.04	-.08	.06	.01	-.01	-.01	-.03	.08	-.04	-.12	-.03	.06	-.06	.45**	.37**	-.43**	-.37**				
NA	-.08	-.01	.11	-.08	-.15*	-.08	-.05	-.11	-.17*	.01	-.11	-.05	-.01	-.10	-.09	-.14*	-.15*	.02	-.18*	.16*	.44**	.20**			
ANX	-.04	.03	.14	-.11	-.04	-.06	-.02	-.11	-.18*	.07	-.07	-.09	-.08	-.03	-.12	-.05	-.14*	-.12	-.36**	.42**	.67**	-.20**	.59**		
DEP	-.02	-.03	.00	-.09	-.05	.04	-.06	-.09	-.11	-.04	-.10	-.15	-.12	.01	-.09	-.14*	-.07	-.24**	-.50**	.46**	.58**	-.30**	.34**	.55**	
HSE	.08	.07	.12	.14*	.09	.10	.08	.17	.06	-.10	-.04	.03	.12	.05	.11	.13	.14*	.14*	.27**	-.22**	.27	.24**	.17*	-.32**	-.28**

5.4 Table 4.11: Correlations between wellbeing and AP level 6 academic performance (L5 cohort)

	DISS	COG NEURO	OCC PSY	FOR PSY	PSY ED	AV6	GPA	HOPE	SWL	LOT	GHQ	PA	NA	ANX	DEP
COG	.38**														
OCC	.41**	.33**													
FOR	.42**	.45**	.27**												
P ED	.32**	.29**	.27**	.27**											
AV6	.71**	.66**	.61**	.61**	.87**										
GPA	.72**	.65**	.60**	.64**	.52**	.90**									
HOPE	.08	-.05	.10	.04	-.03	.03	.01								
SWL	.15*	.09	.12	.11	.06	.13	.13	.43**							
LOT	.07	-.07	-.06	-.17*	-.01	-.11	-.13	-.52**	-.53**						
GHQ	-.05	-.03	.06	-.04	.01	.00	.02	-.24**	-.47**	.42**					
PA	.03	-.10	-.02	.06	-.04	-.05	-.01	.54**	.37**	-.43**	-.37**				
NA	-.22**	-.09	-.04	-.07	.06	-.13	-.13	.02	-.18*	.16*	.42**	.20**			
ANX	-.14*	-.06	-.04	-.07	-.01	-.09	-.11	-.12	.36**	.42**	.67**	-.20**	.59**		
DEP	.10	-.02	.02	-.09	-.01	.03	-.13	-.24**	-.50**	.46**	.58**	-.30**	.34**	.55**	
HSE	.07	.05	.12	.08	.12	.14*	.15	.14	.28**	-.22**	-.27**	.24**	-.17*	-.32**	-.28**

Appendix 6:
Recommended Fit indices for AMOS

Table X Fit indices of the proposed research models

Fit Index	***Recommended Level of Fit Index***	
χ^2	***n.s at p< 0.05***	*Klem (2000); Kline (2005); McDonald and Ho (2002)*
χ^2 ***/df***	***< 3***	*Gefen, Karahanna, and Straub (2003); Kline(2005)*
CFI	***=>0.90***	*Klem (2000); McDonald and Ho (2002)*
TLI	***=>0.90***	*Klem (2000); McDonald and Ho (2002)*
SRMR	***<0.05***	*Klem (2000); McDonald and Ho (2002)*
RMSEA	***< 0.05 (good fit)*** ***< 0.08 (fair fit)***	*McDonald and Ho (2002)*

In the tables and results throughout this thesis a number of abbreviations, acronyms and specific terms are used; consequently a glossary of terms is provided. A key is also provided after each table.

A

A	Alertness
ACS	Academic Conscientiousness Scale
ACT	Actual Sleep
ACTSL	Actual Sleep
AES	Assessing Emotions Scale
Agree	Agreeableness
ANOVA	Analysis of Variance
ANX	Anxiety
AP	Academic Performance
ASE	Academic Self-efficacy
ASS	Assumed Sleep
ASSSL	Assumed Sleep
ATT(EN)	Attention
AV	Average
AV4	Level 4 Average Mark
AV5	Level 5 Average Mark
AV6	Level 6 Average Mark/Overall Award (Degree) Mark
AVSE	Average Sleep Efficiency
AVACTSL	Average Actual Sleep

B

BS	Bodily Symptoms

C

CFI	Comparative fit index
CHD	Childhood Disorders
CLAR	Clarity
Consc	Conscientiousness

D

DEP	Depression
DF(df)	Degrees of Freedom
DISS	Dissertation
DOW	Day of the Week
DYSFUN	Daily Dysfunction

E

EI	Emotional Intelligence
ES	Emotional Stability (positive of Neuroticism; tis term is used more frequently than Neuroticism).
ESES	Emotional Self-efficacy Scale
Extra	Extraversion

F

F	Friday
FA	Factor Analysis
FFM	Five Factor Model

G

GPA	Grade Point Average
GHQ(12)	General Health Questionnaire (12 item scale)
GSE	General Self-efficacy

H

H	High Workload
H(plus number)	Hypothesis
HADS	Hospital Anxiety and Depression Scale
Hope	Adult Trait Hope Scale
HSE	Health Self-Efficacy (Scale)
HSE	High Sleep Efficiency
HSE	Habitual Sleep Efficiency
HWL	High Workload

L

L	Low Work Load
Level 4	First year
Level 5	Second year
Level 6	Third year
Level 6/overall GPA	Final award mark (Degree award).
Level 4 Cohort	Data collected from level 4 in 2012
Level 5 Cohort	Data collected from level 5 in 2012
Level 6 Cohort	Data collected from level 6 in 2012 (this was removed due to very small sample size that provided unsystematic response.
LOT	Life Orientation Test (Optimism)
LWL	Low Workload

M

M =	Mean =
M	Monday
M	Mood
Malaysian Cohort	Data collected from Malaysian students attending LJMU summer school (to fulfil BPS requirements) in 2012.
MANOVA	Multivariate Analysis of Variance
MED	Medicine

N

N	Neuroticism
NA	Negative Affect
NFI	Normed fit index)

O

O	Openness
Occ Psy	Occupational Psychology
OCEAN	Openness, Conscientiousness, Extraversion, Agreeableness Neuroticism
Open	Openness
OSQ	Overall Sleep Quality

P

PA	Positive Affect
PANAS	Positive and Negative Affect Scale
PSQI	Pittsburgh Sleep Quality Index
Psycho(p)	Psychopathology

Q

QoL	Quality of Life

R

REP	Repair
RMSEA	Root Mean Square Error of Approximation
RT	Rise Times

S

SA	Substance Abuse
SAT	Saturday
SD	Standard Deviation
SE	Standard Error
SEM	Structural Equation Modelling
SONA	Service-Oriented Network Architecture: Psychology Experiment Management System
Sport	Sports Psychology
SQ	Sleep Quality
SRMR	Standardised Root Mean Residual
SUN	Sunday
SWB	Subjective Wellbeing (includes PANAS and SWL)
SWL	Satisfaction with Life

T

T	Tuesday
TA	Test Anxiety
TH	Thursday
TEIQ	Trait Emotional Intelligence Questionnaire
TENS	Tension

TIB	Time in Bed
TIRT	Test Irrelevant Thoughts
TLI	Tucker Lewis Index
TMMS	Trait Meta Mood Scale
TOTAL	Total Sleep
W	
WB	Wellbeing
WOR	Worry
W	Wednesday
X	
χ^2	Chi Square

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