



Academic performance beyond cognitive ability: personality, emotional intelligence and self-efficacy – a mixed cross-sectional and longitudinal study

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ABSTRACT

Burgeoning research on Personality-related measures and proximal behaviours demonstrates that academic performance at all levels is facilitated by such individual difference variables that complement and support cognitive ability. The aim of this study is to explore the impact of trait and domain specific measures on academic performance and examine behaviour (absenteeism). Participants ($N = 120$) comprised of male ($N = 47$) and female ($N = 73$) students at a secondary level college in Merseyside. A within-participant design was employed utilising a quantitative cross-sectional survey method (based on self reports) with a longitudinal component linked to archival indicators of performance data (i.e. GCSE exam results) which were aggregated into a Grade Point Average (GPA). The study's hypotheses were tested through bivariate and multivariate analysis. Good quality of data was evidenced by low levels of skewness and kurtosis and high. Correlation analysis revealed that Openness, Conscientiousness, ESE and ASE were positively associated with GCSE GPA. Agreeableness was negatively associated with academic performance. Hierarchical Regression demonstrated that the best predictor of grades was Agreeableness. Results are comparable with much existent research signifying the relevance of individual difference studies at secondary level.

KEY WORDS	PERSONALITY	EMOTIONAL INTELLIGENCE	SELF-EFFICACY	ABSENTEEISM	ACADEMIC PERFORMANCE
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Introduction

Background

There is a need to understand individual differences in educational experience and achievement (O'Connor & Paunonen, 2007; Poropat, 2009) - why some individuals accomplish more than others of similar ability (Duckworth *et al.*, 2007). Typically, the academic performance (AP) of a student is attributed to their cognitive ability and its influence is still consistently demonstrated in current research (Deary *et al.*, 2007). Indeed, ability is of particular importance to students and educators in general (Ackerman *et al.*, 2011). However, this view requires three important provisos; firstly, current research reveals ability to account for approximately only 50% variance on AP (Chamorro-Premuzic & Furnham, 2008). Secondly, the correlation between cognitive ability and AP declines as age and educational level increases (Ackerman *et al.*, 2011). Thirdly, directly related to the first qualification is that individual difference research has accumulated a wealth of literature indicating important non-cognitive factors which contribute to variance on AP that is unexplained by cognitive ability (Ackerman *et al.*, 2011).

From the Personality domain, for example, students considered high in the Conscientiousness trait have been significantly linked with greater AP (Poropat, 2009). Demonstrable behaviours encapsulated by Conscientiousness such as; motivation, organisation and commitment arguably promote learning and subsequently AP (Lubbers *et al.*, 2010). It could also be contended that those who are able to adapt and meet challenges related both to academic and social aspects of education are likely to be more competent and successful (Lopes *et al.*, 2005). Personal perceptions of self-mastery are also vital – a lack of self belief may result in diminished effort and accomplishment; conversely robust levels may potentiate AP (Carroll *et al.*, 2009). There is also the issue that current behaviours may be mediated by factors such as Personality, for example, attendance levels which can consequently impact on AP (Conard, 2006).

Literature Review

Personality – The Five Factor Model

Personality has been extensively investigated with regard to its role in AP (Poropat, 2009). The Five Factor Model (FFM) (McCrae & Costa, 1997) which incorporates five higher-order personality traits into one framework; Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (OCEAN), has been particularly well examined and is currently prevailing in personality research (O'Connor & Paunonen, 2007) (for a historical overview of other perspectives see Poropat, 2009).

Interest in investigating the FFM/Personality in relation to AP, is derived in part from the premise that personality encompasses behavioural predispositions, whilst IQ tests assess maximal performance, Personality tests measure typical performance (Chamorro-Premuzic & Arteche, 2008). Personality may also influence behaviours conducive to AP (O'Connor & Paunonen, 2007). Overall, trends suggest that Personality has incremental variance over and above IQ on predicting AP (e.g. O'Connor & Paunonen, 2007)

Of the Big Five traits, Conscientiousness (C) is the most consistently linked with AP (e.g. Conard, 2006; Chamorro-Premuzic & Furnham, 2003; Komarraju *et al.*, 2009). Indeed, at post-secondary level education, C has been revealed to predict academic achievement with a similar strength to that of cognitive ability (O'Connor & Paunonen, 2007). In a recent meta-analysis C was revealed to have the strongest association with AP at all levels of education (Poropat, 2009). The primary traits of C include self-discipline, organisation and exaction in detail (Lubbers *et al.*, 2010) and as such are directly supportive of academic success – encouraging behaviours conducive to AP (Kappe & van der Flier, 2010).

Openness (O) has also been associated with AP albeit to a lesser extent than C (e.g. Farsides & Woodfield, 2003; Gray & Watson, 2002; Lounsbury *et al.*, 2003). O is moderately related to intelligence and is sometimes referred to as Intellect (Lubbers *et al.*, 2010). Facets such as; a rich vocabulary, open to ideas and abstract thinking are suggested to be supportive of AP (Chamorro-Premuzic & Furnham, 2008). However, other studies have reported no association with AP (see O'Connor & Paunonen, 2007) leading some to propose that Open students may be thwarted as they may have difficulty in following rules for example (Chamorro-Premuzic & Furnham, 2005).

The research relating to E and AP reveals a complex relationship with inconclusive findings – several studies have found a positive relationship with AP and others a negative one (see O'Connor & Paunonen, 2007). This may be due to how the underlying facets are nuanced in each individual, for example; gregariousness has been negatively associated with AP whereas the reverse was found for activity (e.g. Ziegler *et al.*, 2010). E may provide positive utility in assisting social behaviours (e.g. group work/learning) (Bidjerano & Dai, 2007) but extraverts may over indulge in socialising (Chamorro-Premuzic & Furnham, 2008).

The findings for N are similarly mixed – emotional instability can have a detrimental impact upon AP (e.g. Chamorro-Premuzic & Furnham, 2003), whilst emotional stability had been found to have a positive effects on AP (e.g. Furnham & Monsen, 2009). However, overall N has been found to have little impact (Poropat, 2009).

A has probably produced the weakest effect on AP in current research (Poropat, 2009). On an abstract level the connection between A and AP is probably the most remote (Lubbers *et al.*, 2010) as agreeable people are typified as being pleasant and friendly (Kappe & van der Flier, 2010). Typically, small positive findings have been reported (e.g. Farsides & Woodfield, 2003; Poropat, 2009) whilst others have reported mixed impact (O'Connor & Paunonen, 2007).

The underpinning mechanisms that may moderate the relationship between FFM traits and AP have also been examined (e.g. Conard, 2006; Lubbers *et al.*, 2010). Currently research indicates the relation between Personality and AP may be mediated through a variety of means such as; academic motivation (Komarraju & Karau, 2005; Komarraju *et al.*, 2009), learning strategies and approaches (particularly for lower ability students) (Bidjerano & Dai, 2007; Chamorro-Premuzic & Furnham, 2008), attendance (Conard, 2006; Farsides & Woodfield, 2003), homework behaviours (Lubbers *et al.*, 2010), academic confidence (Pulford & Sohal, 2006) and assessment type/preference (Chamorro-Premuzic *et al.*, 2005; Lubbers *et al.*, 2010). These proximal determinants of AP also reflect the general

trends discussed earlier, that is; C and O were the most consistent traits that were significantly linked with these moderating behaviours (Conard, 2006; Komarraju *et al.*, 2009; Pulford & Sohal, 2006).

There has been some critique levelled at the type of AP measurement employed in many studies, such as grade point average (GPA) (Conard, 2006; Komarraju *et al.*, 2009; Laidra *et al.*, 2007) which can be susceptible to grade inflation (Poropat, 2009). However, when treated as a scale the internal reliability of GPA is good, and is consistently correlated with variables such as intelligence (Poropat, 2009). It should also be noted that other studies have found lower-order personality traits to be more successful at predicting AP (Duckworth *et al.*, 2007; O'Connor & Paunonen, 2007).

Emotional Intelligence

Besides the personality literature, there has been a growing interest in the role Emotional Intelligence (EI) may have in scholastic achievement (Di Fabio & Palazzeschi, 2009). EI is a term which describes emotional functioning (Kirk *et al.*, 2008) defined as the ability to register, appraise and cope effectively with emotion (Johnson *et al.*, 2009) as well as the capability to combine cognition with emotion to enhance thought (Mayer *et al.*, 2008). Forming a unified framework however has been elusive (Lopes *et al.*, 2003) and two distinct approaches have emerged from the literature; ability models (Salovey & Mayer, 1990) and trait models (Petrides & Furnham, 2001). Despite this dichotomy, several researchers suggest that each approach is significant, offering complementary contributions and a wealth of literature between them (Austin *et al.*, 2007; Kirk *et al.*, 2008).

The study of EI has focussed upon the nature of such functioning, such as, emotional regulation and enhancement of contemplation, concentration and motivation with their related outcomes (Mestre *et al.*, 2006; Schutte *et al.*, 2010). EI research has generated an extensive literature examining AP as a salient outcome measure (Vidal-Rodeiro *et al.*, 2011) and a positive association between EI and AP has been revealed (e.g. Parker *et al.*, 2005; Parker *et al.*, 2006; Vidal-Rodeiro *et al.*, 2011). The predictive ability of EI has been found to exceed that of prior attainment and cognitive ability (Lam & Kirby, 2002; Qualter *et al.*, 2007), personality (Petrides *et al.*, 2007) and fluid intelligence using both self and ability based measures (Di Fabio & Palazzeschi, 2009).

Interestingly, Petrides *et al.* (2004) reported that the influence of EI was particularly pronounced in low IQ students where subject demand surpassed ability. Specifically, the impact of EI was noted in English and overall GCSE marks only but not Mathematics or Science. However, Adeyemo and Adetona (2007; cited in Adeyemo, 2007) did find a direct relationship with EI and Mathematics. Also to emerge from the literature is the meditational influence of three specific dimensions of EI on AP; adaptability, stress management and inter and intra-personal abilities (Parker *et al.*, 2005; Parker *et al.*, 2006).

Despite these positive findings the relationship between EI and AP remains equivocal – several studies have failed to find any significant relationship between EI and AP (e.g. Amelang & Steinmayr; 2006; Barchard, 2003; Rossen & Kranzler, 2009). However, a body of research is building providing evidence of the considerable broader influence EI may have in terms of other adaptive outcomes

which may impact overall on scholastic experience. Education is a social experience that requires adaption and building relationships with teachers and peers (Mestre *et al.*, 2006). To this extent higher levels of EI has been revealed to positively impact on social competence (Van der Zee *et al.*, 2002), interpersonal relationships (Lopes *et al.*, 2003), self and peer rated quality of social interactions (Lopes *et al.*, 2005; Mestre *et al.*, 2006) and is negatively associated with problem behaviour (Parker *et al.* 2006; Petrides *et al.* 2004), delinquency (Siu, 2009), absenteeism (Animasahun, 2009), stress and depression (Ciarrochi *et al.* 2002; Siu, 2009).

It is important to note that several aspects of the EI literature have attracted commentary in relation to the applicability of findings given the different measures of EI employed across studies (Zeidner *et al.*, 2008). Others have argued that EI is not valid as a construct by itself (e.g. Schulte *et al.*, 2004). However, given that there is overlap between the definitions (Austin *et al.*, 2007), the range of studies help affirm rather than discredit its utility and its validity as a construct has also been upheld in several studies (e.g. Van der Zee *et al.*, 2002; Van Rooy & Viswesvaran, 2004).

More recently, Kirk *et al.* (2008) have developed a measure of Emotional Self-efficacy (ESE). ESE, they propose is related to the construct of trait EI but is distinct from it, relating to self-perceptions and one's efficacy beliefs about emotional functioning (Qualter *et al.*, 2011). As such, ESE in further studies may help with bridging the gap between ability and trait EI models.

Self-efficacy

Self-efficacy (SE) has proven to be a very important variable within the academic domain (Diseth, 2011, Odaci, 2011). Defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce a given attainment" (Bandura, 1997, p. 3), it is subsumed under the 'agentic framework' (Caprara *et al.*, 2008) of Social Cognitive Theory (SCT) (Bandura, 1997). SCT posits that human behaviour is learnt through an interaction of tripartite influence; personal, environmental and behavioural factors (Bandura, 2001). SE beliefs play a central role within this framework due to their potent influence on development and adjustment by both direct and indirect means (Bandura, 2001).

Fundamentally, SE constitutes an important core property of human agency - self mastery over functioning (Benight & Bandura, 2004). Although it can be conceptualized as a generalized construct, many commentators posit that it is best conceived as domain specific and as such has been applied to academia – academic self-efficacy (ASE) (McIlroy & Bunting, 2002).

From an educational perspective greater SE has been linked significantly with superior AP (Carroll *et al.*, 2009; Sharma & Silbereisen, 2007; Zajacova *et al.*, 2005). There can also be a negative association – those with lower ASE typically have a lower AP (e.g. Chemers *et al.*, 2001; Turner *et al.*, 2009). This interactive relationship in which both factors share both causal and consequential roles (Chamorro-Premuzic *et al.*, 2010; Yu-Qian *et al.*, 2011), highlights the importance of confidence in one's own ability, influencing the quality of academic adaption, coping and perseverance (Chemers *et al.*, 2001; Turner *et al.*, 2009).

Given that SE encourages self mastery goals and behaviour - several of these have been identified as significant to this process (Bandura, 2001), for example, self-

regulatory behaviours such as goal setting (Diseth, 2011; Morisano *et al.*, 2010), learning approach (Diseth, 2011), internet information seeking (Yu-Qian *et al.*, 2011), student retention (DeWitz *et al.*, 2009), essay writing motivation and ability (Pajares, 2003), superior coping strategies (Devonport & Lane, 2006) non-delinquent behaviours (Carroll *et al.*, 2009) and life purpose (DeWitz *et al.*, 2009). These mechanisms have been found to be significantly modulated by SE and thus impacting on AP. Interestingly, Yu-Qian *et al.* (2011) found that whilst SE was a significant predictor of AP, it was particularly pronounced in lower aptitude students in which they postulated were provided with an immediate 'boost' in their ability beliefs (p. 2482). It should be noted that not all studies have found a positive association with SE and AP (Choi, 2005).

Rationale

Currently, individual differences have been indicated to add incremental variance on AP (e.g. Poropat, 2009; Qualter *et al.*, 2007). The specific amalgam of factors used in this study ranging from the personality and emotional functioning domain to a self-mastery framework provides the opportunity to determine a cohesive relationship which is currently lacking in the literature (Caprara *et al.*, 2011). Currently, research is burgeoning with the majority of studies examining these components (e.g. FFM, EI, SE) individually and a modest amount including EI as a companion to Personality (Petrides *et al.*, 2007). Therefore this research will contribute and also promote reversal of the current tide that explores these factors in relative isolation.

Furthermore, whilst the majority of individual difference research has reported that these relationships are robust (Caprara *et al.*, 2011; Poropat, 2009) there is some conflict of findings within the literature and the nature of these relationships remain equivocal (Amelang & Steinmayr, 2006; Barchard, 2006). As such, this provides the prospect of testing this with quite a concentrated approach.

There is also a paucity of research involving British secondary level students – currently research is predominated with tertiary level studies (Lubbers *et al.*, 2010). This failure to utilize younger teenagers is particularly remiss as adolescence is a uniquely transitional life stage – presenting inimitable challenges both academically and socially and whilst these external factors may be turbulent, internally traits during this period may in fact be a relatively stable resource (Abe, 2004). From the literature, there is also a growing amount of evidence that factors such as Personality, EI and SE impact upon AP through the mediatory effects of particular behaviours (Animasahun, 2009; Conard, 2006; DeWitz *et al.*, 2009); therefore the role of absenteeism will be examined in this study. Consequently, there is strong justification for theory development entailing what is integral for influencing AP in secondary level education.

Aims and hypotheses

A précis of the aims of this research is as follows; firstly, current research predominantly explores the FFM, EI and ASE in relative isolation (Caprara *et al.*, 2011). Ackerman *et al.* (2011) suggests that the 'predictor space' (p.29) requires expansion from this reductionist approach and by looking at these combinations of factors the nature of their synergism will be uncovered. Secondly, overwhelmingly current research utilises post-secondary level cohorts in the individual differences

domain (Lubbers *et al.*, 2010; Poropat, 2009) and thus this study adds to and encourages the closing of this gap in its application to secondary level schooling. Thirdly, by examining behaviour (proximal) – absenteeism, in addition to the aforementioned factors (distal), the mechanics of current actions with sometimes remote influences (e.g. Personality) on AP, a more fuller picture of AP it is aimed will be modelled.

From the FFM it is hypothesised (H1) that Conscientiousness and Openness will have a positive impact on AP and Extraversion, Neuroticism and Agreeableness will significantly impact upon AP. However, the direction of these relationships is not forecasted. In addition to the FFM factors, it is expected (H2) that EI will be significantly and positively correlated with AP, and that ESE (H3) and ASE (H4) will also be positively associated with AP. It is also expected (H5) that lower absenteeism levels will positively impact on AP. By exploring general personality and emotional functioning traits (FFM, EI, and ESE) alongside domain specific academic functioning and proximal behaviour (absenteeism), these two clusters therefore fulfil the suggestions of Ackerman *et al.* (2011) and O'Connor and Paunonen (2007).

Method

Design

This study employed a within-participant design utilising a quantitative cross-sectional survey method (based on self reports) with a longitudinal component linked to archival indicators of performance data (i.e. GCSE exam results for Mathematics, Science and English). The Dependant Variable was AP (previous GCSE grades). The Independent Variables were self-report measures consisting of five factors: FFM, EI, ESE, ASE and absenteeism rates.

Participants

The sample ($N = 120$) included 47 (39%) male and 73 (62%) female students, aged between 16 and 19 years ($M = 17.01$, $SD = .87$) selected via opportunity/purposive sampling. Of the sample, 67 (56%) reported receiving family support with their studies and coursework was the preferred method of assessment (63%) compared with exam (33%) and oral (5%) (see Appendix 1). All were studying A/S level subjects at the sixth form of a college in Merseyside. Eligibility was limited to those above 16 years who agreed to take part.

Materials

Independent Measures

Personality

The IPIP Big Five Fifty Items (Goldberg *et al.*, 2006). This is a fifty item self-report inventory designed to assess the Big Five factors of personality; Openness to Experience,, Conscientiousness, Extraversion, Agreeableness, and Neuroticism/Emotional Stability. Each factor has 10 items each. Sample items include; “I am the life of the party” (Extraversion), “I am interested in people” (Agreeableness), “I like order” (Conscientiousness), “I get upset easily” (Emotional

Stability) and “I have a rich vocabulary” (Openness) Response format is a five point Likert scale (1= very inaccurate to 5= very accurate). The 5 subscales each had high reliabilities ($\alpha = .81, .74, .81, .77, .78$ respectively) and the inter-correlations between the factors were typically low, not exceeding $r = .31$ (Table 1).

Emotional Intelligence

Assessing Emotions Scale (Schutte *et al.*, 1998). This is a 33 item self report scale developed to assess levels of EI. 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”. The scale has a good alpha level ($\alpha = 0.87$). Higher scores indicate greater levels of EI.

The Trait Meta-Mood Scale (Salovey *et al.*, 1995) is a 30 item self-report measure of EI. It includes items such as “Feelings give direction to life”. The response format is a five point Likert scale with higher scores indicating higher levels of trait EI. Cronbach’s alpha indicates the scale has good internal consistency ($\alpha = .83$). The scale was further subdivided into three subscales; Attention (13 items) (sample item as above), Clarity (11 items) – a sample item is ‘I am rarely confused about how I feel’ and Repair (6 items) – sample item is ‘I try to think good thoughts no matter how badly I feel’. The alpha reported here for each subscale; ($\alpha = 0.76, \alpha = 0.71$ and $\alpha = 0.65$ respectively) indicates reasonably good internal consistency.

Emotional Self-Efficacy

The Emotional Self-Efficacy Scale (Kirk *et al.*, 2008) - this is a 32 item self-report measure of emotional self-efficacy (ESE). Response format is a five point Likert Scale (1= not at all confident to 5= very confident) and includes items such as, “Use positive emotions to generate good ideas” and “Correctly identify your own negative emotions”. Higher scores indicate higher levels of ESE. Good internal consistency was found in this study ($\alpha = .90$).

Academic Self-Efficacy

The Academic Self Efficacy Scale (McIlroy *et al.*, 2000) – this is a ten item self-report inventory intended to measure academic SE. The response format is a seven point Likert Scale (1=very strongly agree to 7=very strongly disagree) and includes such items as – “If I don’t understand an academic problem, I persevere until I do” and “I fear that I may do poorly in my end-of-semester exams”. Higher scores indicate higher levels of academic SE. The alpha reported here ($\alpha = .83$) indicates the scales internal consistency.

Absenteeism

The operational definition of absenteeism was that of the college’s own policy. A student who is absent more than three times in an academic year is automatically spoken to by the head of year and issued with a warning (for non-valid reasons).

Dependent Measure

Academic Performance

Participant's AP will be assessed through their *General Certificate of Secondary Education* (GCSE) performance – specifically in Mathematics, Science and English. These are assessed through a combination of coursework and examination and are graded from A* (highest) through to G (lowest).

Procedure

The college was approached asking permission to take part in the study. Once consent was granted, ethical approval was sought from the LJMU School of Psychology Research Ethics Panel/PsyREC, who verified that the study could commence (see Appendix 2). The research took place on site during allotted times over a three day period. The sixth-form students were invited to take part in the study. If they agreed they were presented with an information sheet and their consent sought. Students were asked to give their name on a consent form that was numbered so the data could be easily aligned and compared with exam data and a matching number to their questionnaire; assurance was further provided that only general trends were being analysed and no individual's data would be targeted for profiling. Once participation was complete and all participants were debriefed, data analysis commenced. This data, in addition to examination results received from the schools database, were transferred to SPSS after being encoded to protect students' identities.

The strategy for data analysis was first to explore the patterns in the data with reference to a range of descriptive statistics (e.g. mean, standard deviation, and histograms) to demonstrate individual differences in performance, then to test the study's hypotheses initially by correlation analyses followed by Hierarchical Regression. Data quality was also tested for reliability, normality and homogeneity. The normal distribution of the data was generally sound; there were violations at the .05, .01 and .001 level (Appendix 1). One of the violations related to the dependant variable (GCSE GPA) of the study, five others related to the independent variables (A, TMMS, TMMS C, TMMS R and ESE) however when skewness/kurtosis were explored they were found to be low, ranging from .11 to 1 (see Table 1). In relation to the correlations (Table 1), two at $p < .01$, and one at the $p < .001$ so no corrections were needed for type 1 errors, three others were at $p < .05$ (ESE – two-tailed, TMMS Attention and C – one-tailed). Finally all reliabilities in the analysis were above the .7 standard (Field, 2005) apart from the reliability for the TMMS Repair subscale which was close ($\alpha = .65$).

Ethical Considerations

This study has been ethically approval by the PsyREC (see Appendix 2). Informed consent was sought and granted by all participants. Participant's identities were protected and confidentiality and anonymity assured, as the participants' names were re-coded into a number which matched up consent form with questionnaire for input of data. Once all the data had been aligned with GCSE examination results from a data file provided by the college all names were then removed. The participants were given the right to withdraw from the study at any time, without

prejudice, and were debriefed. Participants were also provided with the contact information of the researcher should they have any questions or wished to withdraw themselves from the study following participation. No participant was harmed. Other BPS ethical guidelines were also followed.

Results

Table 1

Correlation coefficients and descriptive statistics for self-report measures and Grade Point Average (GPA)

	1	2	3	4	5	6	7	8	9	10	11	12	13
GCSE/GPA(1)	1												
E (2)	-.14	1											
A (3)	-.27**	.14	1										
C (4)	.16^	-.02	.27**	1									
E/S (5)	.19*	.03	-.23*	-.18*	1								
O (6)	.27**	.14	.30**	.32**	-.08	1							
Schutte (7)	.06	.25**	.41***	.34***	-.02	.15	1						
TMMS Total (8)	-.08	.14	.51***	.17	.01	.20*	.52***	1					
TMMS A (9)	-.17^	.02	.60***	.19*	-.19*	.18*	.28**	.81***	1				
TMMS C (10)	.03	.04	.28**	.13	.15	.14	.47***	.81***	.42***	1			
TMMS R (11)	.00	.36***	.18*	.06	.13	.12	.49***	.63***	.25**	.41***	1		

ESE (12)	.19*	.04	.23*	.16	.16	.24**	.50***	.37***	.16	.34***	.38***	1	
ASE (13)	.37***	-.13	-.25**	.09	.13	.01	-.13	-.30**	-.19*	-.19*	-.32***	-.17	1
M	4.57	33.22	35.33	30.53	29.50	34.03	113.40	93.34	39.05	35.32	18.92	108.1	38.56
SD	1.08	8.09	6.73	7.12	7.29	6.58	15.85	14.64	7.96	6.52	4.46	16.87	10.91
Alpha		.81	.74	.81	.77	.78	.87	.83	.76	.71	.65	.90	.83
Skewness	.18	-.24	.07	-.09	.16	.05	.01	.29	-.29	.30	.18	.31	.18
Kurtosis	-.27	-.25	-.46	-.03	-.35	-.67	-.63	1.00	.39	.54	.11	-.20	-.24

Key :- GPA = Grade Point Average E= Extraversion A = Agreeableness C = Conscientiousness E/S = Emotional Stability/Neuroticism O = Openness Schutte = Assessing Emotions Scale TMMS = Trait Meta Mood Scale TMMS A = Attention TMMS C = Clarity TMMS R = Repair ESE = Emotional Self-efficacy ASE = Academic Self-efficacy
 * $p < .05$ (two-tailed), ** $p < .01$ (two-tailed), *** $p < .001$ (two-tailed), ^ $p < .05$ (one-tailed)

Table 1 demonstrates the quality of the data with low levels of skewness and kurtosis (range: .11 – 1 and not statistically significant $p < 1.96$) and high reliabilities (.65 - .90). Strong individual differences across the AP indicator and self-report measures are indicated by the measure of dispersion (SD) – reflecting response deviation from the means. Those correlations that are accepted on a one-tailed test and those $p < .05$ should be accepted with caution however, as these would be forfeited through a Bonferroni Correction.

The mean scores on the FFM are within the parameters 29-40 and are clustered slightly above and below the midpoint which is 30 for each factor. The substantial SDs on each factor (range 6.58 – 8.09) reveals strong individuality of responses within the sample – with no extreme scores (i.e. > 40).

The two measures of EI (Schutte and TMMS) and the ESE measure reflect a positive orientation – all being above each scale midpoint (99, 90 and 96 respectively). The three scales are measured on a similar metric (33, 30 and 32 items respectively, 5-point Likert) and the direction of scores indicates consistency across response orientation. The high SDs suggest that students are experiencing diverse levels of emotional processing ranging from depleted to amplified levels. When the TMMS is analysed in respect of its three subscales; Attention, Clarity and Repair, a similar trend is revealed (i.e. all are in positive parameters).

The mean for ASE (38.56) was just slightly lower than the scale midpoint (40) with a SD of 10.91; this indicates that the students in this sample on average are experiencing just slightly lowered confidence in their academic abilities (assuming a fairly normal distribution). This is noteworthy given the current level of students' educational progression (i.e. studying at A/S level) in this sample and yet they tend to experience lower levels of academic confidence which may impact on future decisions to pursue higher education.

With regard to the correlations presented, five of the self-report measures (C (at one-tailed level), O, E/S, ESE and ASE) are positively related to AP (GPA). This supports the study's hypotheses (H1, H3 and H4). O is at the $p < .01$ and ASE is significant at the $p < .001$ level, Agreeableness was negatively associated with AP ($p < .01$). C and E/S are at the $p < .05$ level - this latter finding should be treated with some caution to allow for type 1 errors. The same caution should be applied to the negative association with TMMS Attention and AP ($p < .05$ – one-tailed).

All associations between the self-reports range from low to moderate levels (see Table 1), so whilst there is overlap there is adequate independence to suggest that each significant factor is adding a unique contribution and therefore are included for further analysis in the Hierarchical Regression (HR) analysis that follows. A t-test was performed to compare low and high self-reported absenteeism in relation to AP (H5) (see Appendix 1). There was a significant difference between low ($M = 4.83$, $SD = 1.16$) and high absenteeism ($M = 4.21$, $SD = .84$; $t(117.97) = -3.39$, $p < .01$ - Levene's test for equality of variance was violated $p < .01$ so equal variances are not assumed – see Appendix 1). High mean (GPA) equates with low absenteeism. Therefore this factor is also included in the Hierarchical Regression that follows (N.B. in building the regression E/S was saturating the model so was excluded in the interests of parsimony).

Table 2

Hierarchical Regression; GPA regressed on the clusters, FFM, EI, ESE, ASE and Absenteeism

	B	SE B	β	R2	Adj. R2	F	F Change (df)
Model 1							
C	.03	.01	.18*	.26	.24	12.40***	12.40***
A	-.07	.02	-.44***				(3,103)
O	.06	.02	.36***				
Model 2							
C	.03	.01	.17^	.29	.26	8.33***	1.91
A	-.08	.02	-.49***				(2,101)
O	.05	.02	.32**				
TMMS A	.00	.01	.01				
ESE	.01	.01	.18^				
Model 3							
C	.02	.01	.10	.41	.38	11.64***	20.24***
A	-.06	.02	-.39***				(1,100)
O	.05	.01	.29**				
TMMS A	.00	.01	.01				
ESE	.02	.01	.22**				
ASE	.04	.01	.37***				
Model 4							
C	.01	.01	.05	.46	.42	12.04***	8.92**
A	-.06	.02	-.38***				(1,99)
O	.05	.01	.28**				
TMMS A	.01	.01	.10				

ESE	.01	.01	.20*
ASE	.04	.01	.37***
Absenteeism	.52	.18	.24**

Key :- GPA = Grade Point Average A = Agreeableness C = Conscientiousness O = Openness TMMS A = Attention ESE = Emotional Self-efficacy ASE = Academic Self-efficacy *p<.05(two-tailed) , **p<.01(two-tailed), *p <.001(two-tailed), ^ p<.05(one-tailed)**

Table 2 displays the results of the (HR) analysis performed in order to examine the relationships between the various self-report factors and AP – building upon the relationships that emerged from the correlation analysis in Table 1 (with the exclusion of the E, E/S, Schutte, TMMS, TMMS Clarity & Repair). It is clear from the results reported in Table 2 that each model is highly significant reflected in each F value ($p < .001$).

In the first model, three factors from the FFM (A, O & C) explain 24 % variance on GCSE GPA performance ($p < .001$) – with A ($\beta = -.44, p < .001$) taking primacy in rank order of contribution, followed closely by O ($\beta = .36, p < .001$) and C ($\beta = .18, p < .05$) being last. Whilst model 2 overall is significant ($p < .001$), when the TMMS Attention and ESE (emotional functioning measures) are added there was no incremental validity as these added only 2% variance ($F\text{-change}(2, 101) = 1.91, p > .05$). TMMS Attention is subsumed when A, O and C are controlled for and ESE only significant on a one-tailed test ($p < .05$). At model 3 further augmentations occur with the addition of a domain specific academic measure (ASE). This adds a substantial 12% incremental variance ($F\text{-change}(1,100) = 20.24, p < .001$) therefore model 3 accounts for 38% ($p < .001$) of variance on GPA and ASE is a highly significant factor within the model ($p < .001$), falling in between A and O in rank order ($\beta = .37, p < .001$).

The fourth and final model accounts for 42% of variance overall on GPA and this is a substantial level of variance attributable to self-report measures and is highly favourable compared with established research (Poropat, 2009). Absenteeism emerges as a strong associate of GCSE performance as evidenced by its beta weight ($\beta = .24, p < .01$), however, A, O, ESE and ASE remain robust within this final model. Indeed, A emerges as the strongest predictor of AP indicated by its primacy ($\beta = -.38, p < .001$) and this was a consistent pattern replicated throughout each step of the regression. Accordingly, the model built here provides powerful support that individual difference variables combined with current behaviour (absenteeism) to explain unique and shared variance thus supporting H1, H3, H4 and H5 with only H2 not supported.

Discussion

Three broad aims were of paramount importance in conducting this study; firstly, current research predominantly explores the FFM, EI and ASE in relative isolation (Caprara *et al.*, 2011). The quality and orientation of data presented here offers a unique insight into the interconnected relationship and overall mainly positive influence these factors have together on AP. Secondly, overwhelmingly the existent literature utilises tertiary level cohorts in the individual difference domain (Lubbers *et al.*, 2010; Poropat, 2009) and thus this study adds to and encourages the closing of this gap by applying current models to secondary level education. This is of particular importance when considering that correlations between cognitive ability and predicting AP typically declines as age and progression through education increases (Ackerman *et al.*, 2011). Thirdly, by examining current (proximal) behaviour (absenteeism) in conjunction with personality, emotional functioning and an academic domain specific measure (distal), a further dimension is added and elucidates the possible mechanics of the impact upon AP. Indeed, the robust pattern

of associations revealed here suggests that this is a valid line of enquiry adding to current research and indicates further comparable study is warranted.

From the FFM framework, the finding (throughout the different stages of analysis) of A having primacy of impact above the other personality traits and that this was negative in direction is a highly significant development. Considering the current trends in the literature suggests that A is of limited impact (O'Connor & Paunonen, 2007), the data presented here contradicts this quite robustly and provides support for the restricted amount of studies that did find a negative association (Paunonen, 1998; Rothstein *et al.*, 1994). Given that A incorporates facets such as, pleasantness, friendliness, modesty and cooperation (Kappe & van der Flier, 2010), as well as interest and concern for others (Costa & McCrae, 1992), one might expect those who have an agreeable personality to be skilled and at ease socially. Therefore, the negative impact on AP is not directly obvious. It may be that some of these factors may serve to distract and interfere with study and development as agreeable students may put other's need 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 (peer pressure), which could have negative impact on study.

O as hypothesised emerged as a positive predictor of AP and remained significant when other factors were controlled for. Given that students who are high in O tend to be open to ideas, have vivid imaginations, and interested in abstract thought (Kappe & van der Flier, 2010), a positive impact on AP was expected and supported (O'Connor & Paunonen, 2007). The correlation and level of variance reported in this study support and actually exceed those in published work (see Poropat, 2009) and as such reinforce the justification of this study and findings. O as expressed in the students sampled here may be manifested in an inquisitive nature to learn new subjects and also be open to new technology that is being increasingly introduced into lessons as an aid to teaching and learning.

C had a mixed pattern of association in this study (see Tables 1 & 2) and was subsumed when other factors were controlled for. This directly contradicts a burgeoning wealth of literature that consistently reveals its predictive power in scholastic achievement (e.g. Conard, 2006; Komarraju *et al.*, 2009). It also challenges the combined effect of C and O often seen throughout studies (Chamorro & Furnham, 2008; Trappman *et al.*, 2007). This actually serves to highlight the need to apply such measures to secondary level students where certain traits may impact differentially compared with the majority of tertiary level work. Students at secondary level are provided with more rigidity, planning, and structured tutor guidance. Therefore it is possible that the students overall in this sample may be reflecting these facets as a result of such support. It may also be the case that at this stage C as reflected here is at a nurturing level and thus important in preparing foundations for future study at tertiary level and beyond.

Two self-report measures of EI were utilised in this study, with no significant relationship with AP found – even in a bivariate analysis. As such, these findings add to the equivocal existent literature, directly supporting studies such as; Amelang & Steinmayr (2006) and Barchard (2003). It should be noted that EI's value may lie in other better adaption functioning, for example, on social competence (Van der Zee *et al.*, 2002) and quality of social interactions (Lopes *et al.*, 2005). Microanalysis did

reveal that the Attention subscale at bivariate level did have a negative association with AP - this may reflect a neurotic tendency to attend too much to emotional processing and thus be a distraction to studies (Sevdalis *et al.*, 2007). However, this association was not revealed above bivariate level.

The related measure of ESE did achieve significance and had a positive impact on AP overall. This finding is of particular importance for two main reasons; firstly, it adds support that this measure is tapping into something that whilst related to trait EI, is actually distinct from it (Kirk *et al.*, 2008). Secondly, it indicates that students' self-perceptions are extremely important in that, having the ability to successfully emotionally function is dependent upon a strong sense of belief/confidence that one can do this (Qualter *et al.*, 2011), which in turn may facilitate enhanced understanding and learning.

The robust positive association of greater ASE and AP as revealed here upholds the wealth of literature revealing similar trends (e.g. Carroll *et al.*, 2009; Sharma & Silbereisen, 2007). It also interlinks with the ESE findings – self-mastery and perception being pivotal to how subsequent behaviour is expressed (AP). SE develops largely in part from mastery experiences and impacts upon the quality of academic coping and adaption which in turn impacts upon subsequent performance experiences – thus the relationship is cyclical. Given, the nature of this relationship and that on average the students in this sample are experiencing slightly lowered levels of ASE; it highlights the importance of encouraging students' confidence in their ability.

It is clear from the results of this study (Table 2) that absenteeism was a strong predictor of AP. This supports current findings that indicate such behaviour is interlinked with individual difference factors and AP (e.g. Conard, 2006, DeWitz *et al.*, 2009). Attendance levels may be characteristic of educational motivation and dedication but also imperative for learning course material. Within the final model developed here A, O, ESE and ASE all added unique contributions to AP and when these factors were controlled for, absenteeism had a substantial effect. This is considerable and is reflective perhaps of the assertion that AP is the combination of personality, human agency, current behaviour and effort (Carroll *et al.*, 2009; Poropat, 2009).

Limitations and modifications

There are several limitations and modifications that should be noted for this research. Firstly; the use of self-report measures have garnered some criticism (Zeidner *et al.*, 2008), inherent problems such as social desirability and response set bias remain an issue when employing such measures in research. However, the data obtained in this study reveals that these constructs as measured have clear validity and applicability at secondary level. Also, by utilising objective indicators of AP (i.e. GCSE grades) this study has avoided the problem of shared or common method variance (Tabachnick & Fidell, 2007). Future research could modify this by obtaining teacher(s') ratings of EI, ESE and alike, thus providing an objective measurement. Secondly; whilst the sample size is not large (prospective research could improve on this) it is representative of a given cohort in a typical secondary school in the U.K. Finally; AP is retrospective rather than prospective in this study (which compromises any predictive utility) however, given the strong association with

self-measurement this would suggest stability of traits and academic functioning over time (Abe, 2004). Future research could improve on this by utilising AP from two time points (e.g. past and future grades) and this would facilitate testing the incremental validity of this cluster of measures over and above previous AP.

Implications

There are several important practical and theoretical implications that follow from this research. This study lends support to further research aimed at secondary level education in order to bridge the gap and examining the nature of these traits both individually and cohesively (Lubbers *et al.*, 2010). The operational definition of absenteeism used was that of the college's own policy, as such, the data here robustly supports their guidelines. Three absences or above invoke a warning and this research suggests the level of seriousness it is treated with is proportional as such absences were negatively associated with AP. There are also didactic and pedagogic implications that can be derived – currently there is a preoccupation in the UK with league tables and grades. Whilst this is very important, by focusing exclusively on performance indicators and tests of ability, educators may be doing a disservice to their students. The relationships reported here and in the broader literature (e.g. Poropat, 2009; Caprara *et al.*, 2011) highlight how such factors complement ability and support learning. Therefore, educators would do well to contextualise the student in the broadest sense. Finally, the mixed impact of the various traits explored here would imply that their distal (Bidjerano & Dai, 2007) nature may emerge more persuasively as students progress through education and when independent and less supported study is required.

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