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**Secondary Level Achievement Non-Intellective Factors Implicated in the Process and Product of Performance**

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### Article

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**Abstract:** The study was developed in the context of Personality and Social Cognitive Theory with constructs that encapsulate non-intellective processes of academic achievement. The goal was to explore the role of the Five Factor Model (FFM) of personality in academic performance and to use this model as a reference point to test the incremental validity of two measures of Self-efficacy (Academic and Emotional) and an indicator of Absenteeism. Participants (N = 120) were comprised of 17-year-old male (n = 47) and female (n = 73) opportunistically sampled secondary level college students. A cross-sectional design was used to examine the relationship between the independent variables (FFM, Academic Self-efficacy, Emotional Self-efficacy, and Absenteeism) and the outcome variable, Grade Points Average (GPA). Correlation analysis found that four FFM factors and the two Self-efficacy measures were associated with GPA. In a hierarchical regression analysis, the FFM explained 22% variance on performance and the two Self-efficacy measures added 9% incremental variance followed by 3% for Absenteeism. Overall, the non-intellective constructs explain a substantial 34% variance on achievement and provide focal points for theoretical, empirical, and pedagogical evaluation. Moreover, they are suggestive of the pathways and processes that support learning, augment ability, and enhance achievement.

Keywords: personality, self-efficacy, attendance, secondary education, academic achievement

## **1. Introduction**

### **1.1 Processes and pathways of academic achievement**

In recent years there has been an expanding recognition of the diversity of factors that make up the predictive map for academic performance (Ackerman, Chamorro-Premuzic & Furnham, 2011) with reference both to intellective and non-intellective predictors of achievement (Deary, Strand, Smith, & Fernandes, 2007; Duckworth, Peterson, Matthews & Kelly 2007; Laidra, Pullman & Allik, 2007). Moreover, there has been an attempt to condense the predictive spectrum into

parsimonious clusters with the non-intellective components organised into broad categories that include personality traits, self-regulation, learning styles and approaches, motivation and contextual factors (Richardson, Abraham & Bond, 2012). However, growing attention to the role of emotions in education (Song, Huang, Peng, Law, Wong, & Chen, 2010) might suggest that this warrants designation as a particularly category in its own right.

This study was developed with reference to drawing from the latitude of these categories and personality traits provide the starting point as they are implicated in a wide variety of students' educational choices (Furnham, 2010). It is concluded that academic performance is a combination of factors such as ability, personality and effort (Conard, 2006; Gagné, & Perés, 2001), and therefore the focus in the research is on constructs that encapsulate the processes, pathways and product of performance (Duff, Boyle, Dunleavy, & Ferguson, 2004; Zusho & Pintrich, 2003). There is a recognised difference between what a student can do and what he will do (Ackerman et al., 2011), and therefore the study highlights the factors that complement and support ability (De Witz, Woolsey & Walsh, 2009).

One of the categories identified by Richardson et al. (2012) is traits, and the Five Factor Model of personality is now widely used in educational research (Di Giunta, et al.; Vedel, 2014), although it was not designed to explain or predict academic performance (Ackerman et al., 2011). The five broad categories are Openness to Experience (or Openness), Conscientiousness, Extraversion, Agreeableness and Neuroticism or Emotional Stability (Costa & McCrae, 1992; Goldberg et al., 2006). However, from these Conscientiousness and Openness emerge most frequently in

association with educational performance (Di Giunta et al., 2013; Richardson et al., 2012). These two combined provide the balance and blend of qualities that include the rhythm, regularity, routine and regulation inherent in Conscientiousness (Di Giunta et al., 2013), complemented by the initiative, independence, innovation and imagination suggested by Openness (Chamorro-Premuzic, & Furnham, 2009; Duff et al. (2004), Jauk, Benedek, & Neubauer, 2014). In spite of some diversity in the research findings related to the predictive validity of the FFM (Farsides & Woodfield, 2003), the research persists and continues to grow (Vedel, 2014). This is because traits have been found to have both direct and indirect effects on achievement (Caprara, Vecchione, Alessandri, Gerbino & Barbaranelli, 2011; Mcilroy, Poole, Ursavas & Moriarty, 2015), and are seen as having a distal effect on educational functioning (Bidjerano & Dai, 2007), and, as noted, impact on a wide variety of educational choices (Furnham, 2010).

## **1.2 Self-efficacy: development of a vital internal resource**

Self-efficacy captures aspects of the two processes identified by Richardson et al. (2012), namely motivation (Zimmerman, 2000) and self-regulation (Komarraju & Nadler, 2013). Within educational research Self-efficacy emerges as a robust construct that provides unique and incremental validity when controlling for intelligence, past performance and other psychological constructs such as Traits, Test Anxiety, Learning Styles and Learning Approaches (Valentine, DuBois & Cooper, 2004; Mcilroy et al., 2015; Richardson et al., 2012). With reference to its operational processes, Self-efficacy is deemed to impact on the choice, continuation and successful completion of academic courses (Bandura, 1997; 2012; Britner & Pajares, 2006), in a process that cultivates mastery experiences. When self-regulatory behaviours are added to mastery experiences and set within the contest of goal setting, then it is clear to see why Self-efficacy is seen

as a critical inner resource (Komarraju & Nadler, 2013) that has been linked adaptively on achievement (Barrows, Dunn & Lloyd, 2013).

According to Bandura (1997) and Pajares (1996), Self-efficacy's predictive role is most efficient when designed to measure specific rather than general applications. This study has followed that suggested approach with the use of a measure of Academic Self-efficacy that covers the breadth of the operational content of Self-efficacy in the context of approach to study behaviours and assessment tasks (Mcilroy, Bunting & Adamson, 2000; Mcilroy & Bunting, 2002). There was an expectation that this measure would be positively associated with GPA (Chemers, Hu & Garcia, 2001; Katz, Elliot & Nevo, 2014). Moreover, the theoretical context for Self-efficacy is Social Cognitive Theory (Bandura, 1997; 2001) - a theory that provides a framework for human potential, personal growth and resilience (Bandura, 2001; Benight & Bandura, 2004; Britner & Pajares, 2006).

### **1.3 Emotional Self-efficacy and the role of emotions in education**

As noted Self-efficacy is linked with self-regulation (Komarraju & Nadler, 2013) and one aspect of self-regulation is emotional regulation. The application of Self-efficacy to emotional regulation has been proposed by Kirk, Schutte & Hine (2008) who developed the Emotional Self-efficacy Scale and this has the advantage of applying a well-established construct to Emotional Regulation. Kirk et al. (2008) argue that their measure captures emotional regulation and this has been widely applied in educational research ranging from predicting academic performance (Mayer, Salovey & Caruso, 2008; Zeidner, Roberts, & Matthews, 2008) to student retention and resilience (Parker, Hogan, Eastabrook, Oke & Wood, 2006). The association of emotions in the overall

educational experience is a growing focal point for research (Song et al., 2010). Students' negative emotions may debilitate their academic performance (Szfranski, Barrera & Norton, 2012), impede their learning (Cassady & Johnson, 2002) and delay or even terminate their progression (Parker et al., 2006). On the positive side, emotions can inspire motivation (Komarraju & Nadler, 2013) and build confidence to continue (Parker et al., 2006). Given that the Emotional Self-efficacy measure used in this study was developed and validated within the context of both Self-efficacy and Emotionality (Kirk et al. 2008), it was expected that the measure would be both positively and uniquely associated with academic performance.

Qualter, Gardner, Pope, Hutchinson & Whiteley (2012) draw the distinction between ability and trait approaches to Emotionality based on a review of the literature in which the distinction is upheld in several meta-analyses (O'Boyle, Humphrey, Pollack, Hawver and Story, 2012; Van Rooy, Viswesvaran & Pluta, 2005). Ability involves perception, use, understanding and regulation of emotions (Mayer, Salovey and Caruso, 2004), whereas Trait is seen as a constellation of emotionally-related self-perceptions that function at the lower echelons of personality (Petrides, Pita & Kokkinaki, 2007). Perceived Emotional Self-Efficacy reflects a trait approach to emotions within the educational context (Qualter et al., 2012), and they also conclude that it impacts on decision-making around learning activities and revision, resilience to stressors and investment of effort in academic pursuits.

The ability approach to emotionality has been associated with academic performance even when controlling for cognitive ability and personality (Marquez, Martin & Bracket, 2006; Lyons & Schneider, 2005), but with Trait based approaches

the evidence is inconclusive (Austin, Evans, Goldwater & Potter, 2005). However, some evidence does show a positive association with achievement (Sanchez-Ruiz, Mavroveli & Poullis, 2013), and there are positive findings related to retention versus drop out (Parker et al., 2006) at tertiary level, and exclusions versus non-exclusions at secondary level (Qualter, 2008). In the present study the measure used is Emotional Self-efficacy with a tentative expectation of a positive association with performance and an opportunity to test its unique relationship with performance when controlling for both Academic Self-efficacy and Emotional Stability.

#### **1.4 Attendance: maximising opportunities to learn**

Although it is expected that attendance would be related to regulatory variables such as Conscientiousness (Di Giunta et al., 2013) and Self-efficacy (Zuffiano et al., 2013), this study aimed to test whether it had a unique association with performance when controlling for the preceding constructs in the study. Attendance is a unique independent variable within this study because it is an objective measure provided by the college and therefore is a counter to the problems that emerge from self-reports alone - i.e. shared or common method variance (Tabachnik & Fidell, 2007). It may also be a behaviour that taps into motivation (Landin & Perez, 2015; Moore, Armstrong & Pearson, 2008), and this is judged to be a vital quality in optimising performance (Richardson & Abraham, 2009). Although guided individual study is encouraged in education (Stoten, 2014), this is not the same as isolated study. Individual study should be a complement to collective work and a counterpart to group work. Attendance helps to enhance individual study by providing a unique opportunity for garnering information, developing learning through questions and answers and nurturing personal growth through the stimulation and spontaneity of the classroom setting (Banerjee,

Weare & Farr, 2014). It was expected therefore that attendance would emerge as a unique and positive predictor of achievement when controlling for the motivational and self-regulatory variables in the study. This expectation is consistent with results reported by Conard (2006) who found that class attendance incrementally predicted GPA and course performance.

### **1.5 Summary of the study**

This study was developed in the theoretical context of Personality and Social Cognitive theory and explored several of the major domains delineated by Richardson et al. (2012) including general traits, motivation and self-regulation with the addition of emotional regulation (Kirk et al., 2008; Song et al., 2010). The aims of the study include testing the FFM in relation to academic performance in a group of secondary students to identify points of commonality and difference with previous work. It was expected that Conscientiousness and Openness would associate positively with achievement (Di Giunta et al., 2013; Laidra et al., 2007; Richardson et al., 2012) but the other three factors were left open-ended due to the sporadic nature of findings related to them (Farsides and Woodfield, 2003; Poropat, 2009; Vedel, 2014). Given that general traits are foundational to individual differences (Pervin, 2003), the FFM provides the basis for testing the incremental validity of Self-efficacy, both Academic and Emotional, with the expectation of positive association with achievement for both (Caprara et al., 2011; Sanchez-Ruiz, Mavroveli & Poullos, 2013; Zuffiano et al., 2013). Finally, attendance was expected to be a positive associate of performance (Conard, 2006; Vincenzo, 2014) as it may be related to the quality and quantity of learning and achievement (Moore et al., 2008). This study tests if Attendance adds incremental variance to academic performance controlling for the regulatory variables, Conscientiousness and Self-



efficacy. In general there is scope to explore non-intellective individual difference variables in secondary students as they approach the transition to tertiary education (Lubbers, Van Der Werf, Kuyper & Hendricks, 2010). The study was anchored in defined theoretical perspectives and nested in empirically validated constructs. The unique combination of these was designed to capture a spectrum of traits, behaviours, beliefs, motivation, self-regulation and emotional regulation with a view to accentuating the processes and pathways that support learning and enhance achievement.

## **2. Method**

### **2.1 Participants**

The sample ( $N = 120$ ) was comprised of 47 males and 73 female students, from a college (in the UK, the final stage of secondary education can be completed at a college as in this case) in the North West of England, with a mean age of 17 ( $sd = 0.86$ ). Participants were recruited through opportunity sampling and were targeted because of their age, year at college, willingness to participate in the study and the availability of their academic performance data. Students had just completed their GCSE's in the UK system (see below under academic performance) and were at the time of the study preparing for the highest level in secondary education (A-levels). These are typically taken around the age of 18 and three subjects would usually be chosen from a wide range in preparation for university entrance or vocational training.

### **2.2 Design**

The study was a quantitative, cross-sectional survey with the independent variables as: a measure of Absenteeism provided by the college and the self-report

measures representing the constructs: Five Factor Model of personality, Academic Self-efficacy and Emotional Self-efficacy. The dependent variable was academic performance or achievement in the form of Grade Points Average.

## **2.3 Measures**

### **2.3.1 Five factor model.** (Goldberg et al., 2006)

This measure is comprised of a 50-item self-report measures with 10 items for each of the five factors: Openness to Experience, Conscientiousness, Extraversion, Agreeableness and Emotional Stability/ Neuroticism. Sample items from each of the five respectively are: "I have a rich vocabulary", "I like order", "I am the life of the party", "I am interested in people" and "I get upset easily". A few of the items from each of the factors are reversed scored. Respondents are directed to endorse these items by encircling one of five anchor points presented in Likert format ranging from 1 = Very Inaccurate to 5 = Very Accurate. This version of the FFM has elicited sound psychometric properties in previous research (Gow et al., 2004) and this study has supported that with high reliabilities, good indicators of normality, association with academic performance and independence between the factors.

### **2.3.2 Academic self-efficacy.** (Mcilroy et al., 2000)

This is a 10-item self-report measure designed to assess Self-efficacy within the academic setting with a 7-point Likert response format with anchor points set at, 1 = Very Strongly Agree to 7 = Very Strongly Disagree. A sample item is, "If I don't understand an academic problem, I persevere until I do", with a few items reverse

scored. Good reliability and association with academic performance from previous research were replicated in the present study.

### **2.3.3 Emotional self-efficacy scale.** (Kirk et al., 2008)

In this measure 32 items are presented in 5- point Likert format, ranging from 1= Not at all confident, to 5 = Very confident. This measure was designed to capture emotional awareness, regulation and management with items such as, "Correctly identify your own negative emotions" and "Use positive emotions to generate good ideas". Kirk et al. (2008) found that their 32 items loaded above 0.5 with an eigenvalue of 13.96. This was so far removed from the four eigenvalues that followed (1.65 and below) that they argued for a one dimensional solution, although conceptually their measure encapsulated the four aspects of Mayer, Salovey and Caruso's (2004) model: Understand, Perceive, Facilitate and Regulate. This study has followed Kirk's unidimensional approach for parsimony whilst recognising that further refining work may be needed to obtain a stable solution.

### **2.3.4 Academic performance.**

This was comprised of participants' most recent indicators of academic performance in the form of the General Certificate of Secondary Education (GCSE). Three of the subjects taken, English, Mathematics and Science were selected because they are core curriculum subjects taken by all students in the college and typically across the nation. Each subject is graded from A\* through to G (highest to lowest) although scores were reversed for the correlations so that positive coefficients would reflect higher achievement. Grade Points Average (GPA) was comprised of the

composite of the three scores divided by three. Potential range for GPA was 1-8 and actual range was 2-7.

### **2.3.5 Absenteeism.**

The metric for this was a simple, dichotomous, 1 = problematic absenteeism more than 3 absences for non-valid reasons:  $n = 50$ , and 2 = unproblematic absenteeism:  $n = 70$ .

## **2.4 Procedure**

Data were collected during regularly scheduled learning sessions and instructions were presented to guide the participants through the exercise. No time limit was imposed and the typical response time for the exercise was 15-20 minutes. Before the study was conducted, ethical approval was granted by the researchers' institution. The data were screened for distribution and normality and were tested with reference to reliability and normality. After the sound quality of the data had been established, the study's hypotheses were tested at bivariate level through correlation analyses. Building on the significant associations, the FFM was entered first into a hierarchical regression because it embodied general traits which are set first because of their link to heritability; the two Self-efficacy constructs were entered next together because of their specific content and commonality, and their link to developmental adaptation; Attendance was entered last to test whether it offered unique variance when controlling for the regulatory components in traits, given that it has previously been used as a predictor variable (Conard, 2006; Vincenzo, 2014). Gender was not included because of no significant performance differences, although it is presented in the correlation matrix to demonstrate its relationship with the constructs in the study.

### 3. Results

**3.1 Table 1**

Descriptive statistics and reliabilities for personality-related measures and GPA

	Mean	SD	Skewness	Kurtosis	Alpha
GPA	4.57	1.08	.18	-.27	-
Extraversion	33.22	8.06	-.24	-.22	.81
Agreeableness	35.38	6.69	.06	-.44	.74
Conscientiousness	30.53	7.06	-.09	.02	.80
Emotional Stab	29.50	7.20	.16	-.28	.76
Openness	34.03	6.55	.05	-.63	.78
Emotional SE	108.10	16.79	.32	-.18	.90
Academic SE	38.57	10.77	.18	-.19	.83

Key: GPA = Grade Points Average; Emotion Stab = Emotional Stability; Academic SE = Academic Self-efficacy; Emotional SE = Emotional Self-efficacy. SD = Standard Deviation.

Table 1 demonstrates the quality of the data from several perspectives: high reliabilities of the measures (Cronbach's Alphas: 0.74 to 0.90), and the low levels of skewness and kurtosis (ranging from 0.02 to -0.63) - all <1 and therefore excellent indicators of normality (Lei & Lomax, 2009). In addition, all standard deviations are indicative of good dispersion from the means, and mean differences across the FFM range from 29.50 (Emotional Stability) to 35.38 (Agreeableness) with evident individual differences within each factor (standard deviations range from 6.55 to 8.06).

Also, the young students endorsed Emotional Self-efficacy above the scale midpoint of 96 (i.e. 108.10), whereas they endorsed Academic Self-efficacy marginally below the scale midpoint of 40 at 38.57, with standard deviations again reflecting individual differences in dispersion from the mean.

### 3.2 Table 2

Correlation coefficients for self-report measures and academic performance (GPA)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
GPA (1)	1									
Extra (2)	-.14	1								
Agree (3)	-.26**	.15	1							
Cons (4)	.16* <sup>1</sup>	-.02	.28*	1						
ES (5)	.19*	.03	-.22*	-.18*	1					
Open (6)	.27**	.14	.30**	.40**	-.07	1				
ESE (7)	.19*	.04	.24**	.15	.16	.24**	1			
ASE(8)	.36**	-.13	-.25**	.08	.13	.01	-.17	1		
Gen (9)	.05	.19*	.13	-.01	-.25**	-.07	.13	-.07	1	
Abs (10)	.28**	.00	-.13	.16* <sup>1</sup>	.05	.06	.14	.05	.01	1

Key: Extra = Extraversion. Agree = Agreeableness. Cons = Conscientiousness. ES = Emotional Stability. Open = Openness. ESE = Emotional Self-efficacy. ASE = Academic Self-efficacy. Gen = Gender. GPA = Grade Points Average. Abs = Absenteeism. \*  $p < .05$ .  $p^{*1} < .05$  (one-tailed). \*\*  $p < .01$ .

In Table 2, 4 of the 5 FFM factors are significantly associated with GPA (Agreeableness, Conscientiousness, Emotional Stability and Openness). Conscientiousness can only be accepted on a one-tailed test, and Openness ( $r = 0.27, p < .01$ ), and Agreeableness ( $r = -0.26, p < .01$ ) are respective positive and negative associates of performance from the FFM. Emotional Stability and Emotional Self-efficacy have the same correlation with GPA ( $r = 0.19, p < .05$ ). Also the inter-correlations do not exceed  $r = 0.32$ , demonstrating independence across the constructs.

Academic Self-efficacy is the strongest associate with GPA ( $r = .36, p < .01$ ). The associations of Conscientiousness, Openness, Emotional Self-efficacy and Academic Self-efficacy with GPA were expected, but the associations between Emotional Stability and Agreeableness with academic performance, although not predicted, were not surprising. However, results reported at the  $p < .05$  level should be interpreted with caution to allow for type 1 errors.

Absenteeism is presented in the hierarchical multiple regression analysis in Table 3 and it is used there because it was significantly related to GPA ( $r = .28, p < .01$ ; mean for problematic attendance = 4.21,  $sd = .84$ ; mean for non-problematic attendance = 4.83,  $sd = 1.17$ ). However, Absenteeism was not associated with the other variables in the analysis with the exception of a marginal relationship with Conscientiousness ( $r = .16, p < .05$ , one-tailed), with good attenders registering higher Conscientiousness than problem attenders (respectively, 31.49; 29.18).

Gender was not statistically significant in relation to GPA ( $p > .05$ ), with means at 4.50 for males, and 4.62 for females, but it did have associations with Emotional

Stability ( $r = -.25, p < .01$ ), and Extraversion ( $r = .19, p < .05$ ). Mean scores showed that males were higher than females on Emotional Stability (respectively, 31.74: 28.06) but lower on Extraversion (respectively, 31.37: 34.41). Emotional Stability is included in the hierarchical regression and it may be that further exploration with a larger sample would uncover interaction effects of gender and Emotional Stability in relation to GPA.



**3.3 Table 3:** Hierarchical Regression: GPA regressed on Personality (FFM), Self-efficacy (Emotional and Academic) and Absenteeism.

<u>Model 1</u>	B	SE B	$\beta$	F (df)	Adj. R <sup>2</sup>
Openness	.06	.02	.33**	9.59 (4, 115)**	.22
Conscientiousness	.03	.01	.19*		
Agreeableness	-.06	.01	-.38**		
Emotional Stability	.03	.01	.17*		
<u>Model 2</u>	B	SE B	$\beta$	F (df)	Adj. R <sup>2</sup>
Openness	.05	.01	.28**	10.09 (6, 113)**	.31
Conscientiousness	.02	.01	.12		
Agreeableness	-.06	.01	-.34**		
Emotional Stability	.01	.01	.09		
Emotional Self-efficacy	.01	.01	.22**		
Academic Self-efficacy	.03	.01	.29**	F Change = 8.58**	
<u>Model 3</u>	B	SE B	$\beta$	F (df)	Adj. R <sup>2</sup>
Openness	.05	.01	.28**	9.57 (7, 112)**	.34
Conscientiousness	.01	.01	.09		
Agreeableness	-.05	.01	-.30**		
Emotional Stability	.01	.01	.09		
Emotional Self-efficacy	.01	.005	.20**		
Academic Self-efficacy	.03	.01	.29**		
Absenteeism	.37	.17	.17*	F Change = 4.55*	

\*  $p < .05$ . \*\*  $p < .01$ . Absenteeism coded: 1 = problematic absenteeism (more than 3 in one year for non-valid reasons); 2 = No problematic absenteeism.

In model 1 in Table 3, 4 of the 5 FFM factors combine to explain substantial (22%) variance on academic performance. Furthermore, each of the four factors in the model offers a unique contribution. In terms of rank order, Agreeableness is strongest, followed by Openness, Conscientiousness and Emotional Stability. In the second model, the F-change and model overall are statistically significant, explaining incremental variance (9%), attributable to Emotional Self-efficacy and Academic Self-efficacy. Four of the six variables from the model remain statistically significant with Conscientiousness and Emotional Stability being subsumed. In the rank order indicated by the beta weights, Agreeableness continues to have primacy followed by Academic Self-efficacy, Openness and finally Emotional Self-efficacy. In the final model (3), the four variables from model 2 remain with a similar pattern of rank order. However, the addition of Absenteeism adds 3% incremental variance with a significant F-change and a model that is statistically significant overall. Therefore, Absenteeism has a unique role within the model after controlling for six covariates (four FFM factors and the two efficacy variables). The final model explains substantial variance (34%) with reference to non-intellective associates of GPA, but it should be noted that the beta values in Table 3 are marginally higher than the zero order correlations in Table 1. This may possibly be explained by additional variance attributable to interactions between the variables.

Although Conscientiousness is not robust beyond model 1 in Table 3, its value ( $\beta = .19, p < .05$ ) is similar to the effect size reported by Poropat (2009). Moreover, when its part correlation is examined by removing its statistical association from each  $R^2$  in Table 3, the  $R^2$  drops from .22 to .20 in model 1, from .35 to .31 in model 2 and .374 to .368 in model 3 (latter is trivial).

#### 4. Discussion

This study was set within the context of Personality and Social Cognitive Theory, and the latter was applied with reference both to the academic content in the Academic Self-efficacy Scale (Caprara et al., 2011; Mcilroy et al., 2013) and to the emotionality content in the Emotional Self-efficacy Scale (Kirk et al., 2008; Qualter et al., 2012). The aim of this study was to continue to explore the predictive map in relation to academic performance (Ackerman et al., 2011) in the context of secondary education (Di Giunta et al., 2013; Lubbers et al., 2010) with reference to several of the categories identified by Richardson et al. (2012). Previous research had suggested that the non-intellective predictors of performance required continued exploration (Deary et al., 2007; Laidra et al., 2007), and in order to capture a good latitude of individual differences this study used the Five Factor Model of personality (Goldberg et al., 2006), the Academic Self-efficacy Scale (Mcilroy et al., 2000), the Emotional Self-efficacy Scale (Kirk et al., 2008) and Absenteeism (Moore et al., 2008). When the operational definitions of the constructs are explored they are seen to cover traits, behaviours, emotions, beliefs, motivation and self-regulation as called for in previous research (Richardson et al., 2012; Wolfe & Johnson, 1995).

The breadth of the individual differences covered may provide an explanation for the variance (34%) explained in GPA (cf. Richardson et al., 2012; Vedel, 2014). It can be seen in the hierarchical model presented in Table 3 that the FFM explained 22% variance on GPA, and this was augmented by 9% when the two Self-efficacy variables were added (Academic and Emotional). A further 3% incremental variance was added when Absenteeism was included in the final model.

Support for the study's hypothesis related to the FFM was mixed: Openness as expected was positively associated with performance and remained significant controlling for the two Self-efficacy variables and Absenteeism. Although Conscientiousness was subsumed in the study in the multivariate analysis, it is universally recognised as important because it embodies a methodical and analytic approach to study (Di Giunta et al., 2013), as well as motivation (Richardson & Abraham, 2009) and planning (DeFeyter, Caers, Vigna, & Beings 2012). Given that Conscientiousness is normally a robust associate of performance (Trapmann, Hell, Hirn & Schuler, 2007), a challenge is to explain the contrary non-significant (or limited) finding here. However, not all reported findings relating Conscientiousness and GPA are statistically significant and the confidence intervals around reported effect sizes do allow some diversity from study to study (Poropat, 2009). One explanation is that conscientious students may take on too many extra-curricular activities that distract from optimal performance (Cucina & Vasilopolous, 2005). However, there is a consensus that conscientious qualities enhance individuals' performance although this may not always be apparent in nomothetic research which can disguise the full value of Conscientiousness at an ideographic level.

Although Openness is usually below Conscientiousness in predictive rank order (Poropat, 2009), this was reversed in this study suggesting that the students who showed more initiative, independence and innovation, were likely to excel. However, the balance and blend of the qualities enveloped by Conscientiousness and Openness provide the commended pathway toward progress and transition into tertiary level education (Laidra et al., 2007). In this study Openness plays a greater role statistically in relation to academic performance than Conscientiousness, and it has been noted that

Openness is the personality factor most consistently related to Intellect (Laidra et al., 2007; Richardson et al., 2012). Therefore, if a measure of Intelligence had been included, it is possible that Openness would be subsumed and Conscientiousness would be more salient than Openness in relation to GPA.

A finding of note emerging from this study was that Agreeableness, normally rank-ordered lowest from the FFM in predictive validity (Poropat, 2009), emerged as the most robust variable as seen with the negative beta weight as reported in Table 3. A few previous studies had found that Agreeableness was negatively associated with performance (Laidra et al., 2007; Rothstein, Paunonen, Rush & King, 1994; Saklofske, Mastoras, Beaton, & Osborne, 2012), and the educational value linked to Agreeableness includes eliciting help when required, a good working rapport with peers and tutors and obtaining good references from tutors. However, the challenge for tutors and students, arising from these results, is to support the nurturance of the educational qualities linked to Agreeableness (Saklofske et al., 2012), whilst safeguarding time and prioritising personal educational needs as a balance to protect investment of quality time and effort in learning and achievement. Some suggestions why Agreeableness is negatively and significantly related to performance in this study might include: using up preparation time in helping others and being diffident about asking for help to avoid giving the impression that the Agreeable students had been inattentive to the tuition.

As hypothesised, Academic Self-efficacy emerged as a positive associate with achievement and was stronger and more robust (regression) than the FFM as shown by its beta weight ( $\beta = .29$ ). A minority of studies report no association between Self-

efficacy and Academic Performance (Choi, 2005) but this study supports the well-established link between the two (Chemers et al., 2001; Valentine et al., 2004), and that that link is likely to be corroborated when specific measures are used (Mcilroy & Bunting, 2002; Zuffiano et al., 2013). Self-efficacy is embedded in the Social Cognitive Theory perspective (Choi, 2005; Bandura, 2012), and has a solid empirical foundation in research that spans recent decades (Multon et al., 1991; Katz et al., 2014).

Furthermore, it has momentous pedagogical value as can be seen when its operational definition is explored. For example with reference to verbal persuasion (Bandura, 1997), Tuckman (2003) concluded that strategic use of feedback nurtures confident beliefs, motivation and achievement, and Komarraju and Nadler (2013) advocated the use of effective feedback to reinforce Self-efficacy-related behaviours. From the standpoint of students, possibly in conjunction with their tutors, goal setting within the framework of Self-efficacy (i.e. setting realistic and achievable goals with incremental development) is an effective mechanism for sustaining progress (Diseth, 2011; Pintrich, 2003).

Moreover, processing each success provides empowerment through mastery experiences that add momentum to confidence and motivation (Britner & Pajares, 2006).

The hypotheses closely linked to Academic Self-efficacy was that Emotional Self-efficacy was also expected to be positively associated with academic performance and this was also supported as seen in Tables 2 and 3. Also Emotional Self-efficacy emerged as a unique associate with performance alongside the regression covariates and thus supported incremental validity (Mayer et al., 2008; Qualter et al., 2012). The study of emotions has been recognised as salient in the educational domain (Song et al., 2010), and applications have included Emotional Regulation (Kirk et al., 2008), Test

Anxiety (Zhang, & Henderson, 2014) and Neuroticism (Moutafi, Furnham, & Tsaousis, 2006). The Self-efficacy construct provides an excellent framework in which to capture emotional self-regulation and self-management, given that anxiety can affect students before and during assessment tasks (Cassady & Johnson, 2002). Recovering from negative emotional experiences is an important aspect of progression in education (Brackett, Rivers & Salovey, 2011) and Self-efficacy provides a framework for fostering confident self-beliefs for steady progress. Moreover, findings from this study indicate that Emotional Self-efficacy may have a unique role in the process, especially given that it had stronger weighting than the Emotional Stability personality trait. Added to this is the fact that education is perceived as a social experience that requires adaptation and building a working rapport with both students and tutors (Mestre, Guil, Lopes, Salovey, & Gil-Olarte, 2006). Due to the small sample size the researchers were unable to test adequately the stability of the factor structure advocated by Kirk et al. (2008). However the measure did yield sound psychometric properties on all other indicators including normality, dispersion, reliability and incremental validity. Further work is required on the dimensionality of the measure as it may have an important contribution to the growing exploration of the role of emotions in education (Uzuntiryaki-Kondackci, & Kirbulut, 2016).

The final hypothesis related to Attendance or Absenteeism, with the expectation of a positive association with performance (Conard, 2006; Vincenzo, 2014), was supported. Attendance at learning sessions is a very specific behaviour that may reflect not only motivation but also the practical process of garnering information vital to assessment tasks (Moore et al., 2008). In this study Attendance added incremental variance (3%) to personality traits and to Academic and Emotional Self-efficacy. A

basic premise of all studies of this nature is that effort complements ability in the enhancement of learning and performance (De Witz, 2009; Duckworth et al., 2007; Gagné & Perés, 2001) and results here indicate that Attendance is uniquely advantageous. Motivated, dedicated students who maximise their opportunities to learn (Conard, 2006; Zusho & Pintrich, 2003) benefit from the stimulation of group learning and the additional insight that can be obtained from the spontaneity of an interactive learning session (Banerjee et al., 2014). There was only a tenuous link between Attendance and Conscientiousness as noted at Table 2 (one-tailed) but this may warrant the continued use of both, and the association may suggest exploration of interactions. The same conclusion can be applied to gender as although it was not significant in relation to GPA, its associations with Extraversion and Emotional Stability may warrant further explorations through interactions in future studies with larger samples. The finding related to Attendance was robust in that the variable explained 3% incremental variance on GPA in the final step of the hierarchical regression analysis controlling for all other covariates within the model

In conclusion, this study set out to test a range of non-intellective qualities that are likely to be associated with academic performance, and the level of variance accounted for in this study (34%) suggests that this has been successful. The study therefore assisted in the quest for the exploration and consolidation of the predictive map (Ackerman et al., 2011), in the context of secondary education (Lubbers et al., 2010). Findings obtained demonstrate that the FFM continues to have applied research value, and that somewhat surprising if not totally unexpected findings can emerge (O'Connor & Paunonen, 2007; Poropat, 2009). For example, Agreeableness was the most robust associate with performance in the study with a negative direction of effect,



warranting continued attention given its occurrence in a few previous studies (Laidra et al., 2007; Rothstein et al., 1994; Saklofske et al., 2012).

The positive association of Academic Self-efficacy with GPA was expected, and the moderate and robust nature of the outcome leads to the commendation of specific rather than general applications of the construct (Pajares, 1996; Zuffiano et al., 2013). Furthermore, the unique contribution of Emotional Self-efficacy, and more generally emotions in education (Song et al., 2010), highlights that emotions may warrant being a unique category in what is described as the predictive map or predictive space (Ackerman et al., 2011; Richardson et al., 2012). Moreover, the unique contribution elicited by Attendance is suggestive of its value in the process and product of academic achievement. The study has been informed by and embedded within Personality Theory and Social Cognitive Theory and by a good latitude of non-intellective associates of performance including beliefs, behaviours, traits, motivation, emotions and self-regulation. These are factors that support and consolidate learning, facilitate and maximise achievement and that complement and augment ability.

Limitations in this study include recognition of the potential problem of response set and social desirability inherent in the use of self-reports (Zeidner et al., 2008). However this is countered by the use of validated measures and the inclusion of non-subjective measures such as Attendance and also actual rather than self-reported performance data. These features counter the problem of shared method variance (Tabachnik & Fidell, 2007). Also there is no intellective measure of cognitive ability, and GPA may measure achievement but does not inherently capture individual learning processes. Nevertheless, the variance explained in this study and the demonstrable

unique value from each regression cluster is of adequate justification for the choices made. Future studies might also add a measure of cognitive ability and/or previous performance to ascertain the unique value of the constructs used here when controlling for these additional factors.

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