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Personality, assessment methods and academic performance

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Abstract This study examines the relationship between personality and two different academic performance (AP) assessment methods, namely exams and coursework. It aimed to examine whether the relationship between traits and AP was consistent across self-reported versus documented exam results, two different assessment techniques and across different faculties. There were 1,013 (622 female) university students from four British Universities in four faculties namely arts/humanities, social sciences, life/biological sciences and mathematical sciences. Participants completed a brief version of the Big Five inventory and a self-report measure of AP. Conscientiousness and Agreeableness were the strongest personality predictors of AP. Structural equation model showed that sex and personality effects on AP were invariant across different areas of study or degree types (humanities, social sciences, life sciences and hard sciences). Personality variables are stable, robust and predictable correlates and determinants of AP. Conscientiousness, Openness and Agreeableness were positive predictors as measured by good grades whilst Neuroticism and Extraversion were correlates of weaker performance. Implications of these results refer how teachers choose to examine their pupils and to what extent students choose courses because of their known examination procedures.

Keywords Personality · Big Five · Academic performance · University assessment methods · Gender · GPA

Assessment methods (AM)

Accurate, fair, efficient student assessment is an issue of central concern in higher education for students and their teachers. Changes in the use of different AM have given rise to the increasing number of universities that are shifting from traditional examinations to

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continuous (coursework) (Heywood 2000). Coursework can take many different forms from large scale dissertation projects to short written assignments. They differ from exams where knowledge or skill is tested for a very specific period of time. Moreover, it has been widely acknowledged that the chosen AM will determine the style and content of student learning and skill acquisition (Heywood 2000). As a consequence, AM are increasingly designed to measure *understanding* rather than *memory/knowledge* and to influence and shape the ways students learn (Brown and Glasner 2003). This may explain the increased reliance on coursework AM (and thus, the reduced reliance on exams) as this type of AM in contrast with traditional examinations, effectively measures higher level skills and abilities which subsequently promote deeper learning styles.

In addition, coursework AM aid learning through the provision of timely feedback with the aim of improving deficient areas (Brown and Glasner 2003), whereas exams fall short of providing such feedback. Interestingly, anxiety has been found to be associated with *lack* of feedback (Heywood 2000). Seen examinations (e.g. open-book exams and take home exams) have been found to show evidence of synthesis, analysis and evaluations associated with deeper understanding (Brown and Glasner 2003) and thus, may stand as reasonable proxies to coursework AM. Student assessment has been an active field of educational research and application (Ismail et al. 2010; van Bragt et al. 2011). It has seen changes in ideas about the assessment *of* learning to the assessment *for* learning. Further, new forms of assessment have been proposed like peer or self-assessment (Scouller and Prosser 1994).

There is now an extensive and growing literature on student's perceptions about assessment and evaluation in higher education (Birenbaum 1997; Kniveton 1996; Marlin 1987; Gijbels and Dochy 2006). Studies from countries as different as Saudi Arabia (Amin et al. 2011), the Netherlands (van de Watering et al. 2008) show similar results though Bartram and Bailey (2010) have shown some cultural differences.

Much of this literature has concentrated on one particular assessment technique namely multiple choice questions (MCQ's) (Alker et al. 1969; Birenbaum 2007; Scouller 1998; Scouller and Prosser 1994) and one individual difference factor, namely approaches to learning. Struyven et al. (2005) reviewed 35 salient papers on the topic. They concluded that a students' approach to learning is a clear and logical correlate of assessment preferences and that the AM has an impact on the students learning approach and vice versa. They noted that studies have focussed on essay versus MCQs examinations and that students' low in test taking anxiety and good learning skills prefer essays over MCQs, but that high anxious, poor learning skill students prefer MCQs which elicit surface approaches to learning MCQ's are an alternative to essay writing which is considered a traditional exam method where students sit timed exams under strict conditions. This is one method (i.e. exams) that is considered in this study.

There appear to have been various studies in the area of student preference for AM (Chamorro-Premuzic et al. 2005; Furnham and Chamorro-Premuzic 2005a, b; Furnham et al. 2011; Furnham 2008; Segers and Dochy 2001). They show consistent findings: students prefer MCQ and Continue Assessments most, oral exams, group work and final year dissertation least.

Given the advantages and disadvantages of both AM, it is not surprising that there has been a growing interest to evaluate the consequences of shifting from exams to coursework AM, particularly as there is evidence for the fact that students' performance varies across different AM (Billington 1997; Edgerton and McKechnie 2002; Furnham et al. 2011). However, little previous research has investigated whether and how such variability in AM preference and performance may be explained by any individual difference constructs, notably personality traits. This is the focus of the current study.

Personality and academic performance (AP)

A growing number of publications have shown that personality traits have independent and incremental validity to traditional measures of scholastic achievement i.e. cognitive abilities in explaining individual differences in overall AP (Ackerman and Heggestad 1997; Chamorro-Premuzic and Arteche 2008; De Fruyt and Mervielde 1996; Furnham et al. 2003). In particular, the Big Five factor personality domains (Costa and McCrae 1992) have been found to show predictive validity in explaining post-secondary and college performance (e.g. Chamorro-Premuzic and Furnham 2003a, b; DiFabio and Busoni 2007). It should be pointed out that other studies have found that various other individual difference factors influence AP like emotional intelligence (Laborde et al. 2010) and motivation (Anderson and Keith 1997).

Meta-analyses (O'Connor and Paunonen 2007; Poropat 2009; Noftle and Robins 2007) of the relationship between the Big Five and AP (post-secondary and college level) show that Conscientiousness is a reliable predictor of academic success (Grade point average: GPA) and course grades (Goff and Ackerman 1992; Chamorro-Premuzic and Furnham 2003a, b). Such findings reflect the tendency of this trait towards intrinsic motivation (Anderson and Keith 1997), self-discipline, achievement striving and dutifulness (Chamorro-Premuzic and Furnham 2003b) and an ability to consolidate learning (Drabick et al. 2007). Other studies showed that Openness was typically positively associated with AP (e.g. Duff et al. 2004). This relationship is usually understood in terms of ability such that measures of Openness typically correlate positively with intelligence measures (Ackerman and Heggestad 1997), which in turn has been positively correlated with scholastic success (Busato et al. 2000).

In addition, Neuroticism was found to negatively correlate with the GPA, thesis research and course grade measures of AP (Chamorro-Premuzic and Furnham 2003a, b). This may be explained by the significant association found between this trait and heightened test anxiety (Chamorro-Premuzic et al. 2008); related poor self-concept (Wells and Matthews 1994); and low self-estimated intelligence (Chamorro-Premuzic et al. 2004).

The Extraversion and AP association was found to produce negative correlations with GPA (Bauer and Liang 2003; Goff and Ackerman 1992). Some researchers, notably Sanchez-Marin et al. (2001) have suggested that extraverted students underperform academically due to their sociability, distractibility and impulsiveness. The Agreeableness and AP relationship showed mixed results; the trait was correlated with GPA positively (Gray and Watson 2002), and GPA negatively (Rothstein et al. 1994). It is noteworthy that the Agreeableness primary traits e.g. trust, altruism, tender-mindedness etcetera are typically not associated with academic success. However Poropat (2009) in a meta analysis did find Agreeableness correlated with AP.

In spite of the many studies concerning personality (and ability) correlates of AP, little is known about the effects on this relationship when different AM are considered. A few studies (Chamorro-Premuzic et al. 2005; Furnham and Chamorro-Premuzic 2005a, b) have investigated the association between the Big Five personality traits and preferences for specific and well known AM. The findings showed that some personality traits (Neuroticism-negatively; Extraversion and Openness-positively) related to a preference for oral exam; and MCQs (Openness-positively); as well as with a preference for group work (Agreeableness and Extraversion-positively) and continuous assessment (Openness-negatively; Conscientiousness-positively) as well as dissertation (Extraversion-negatively; Conscientiousness-positively). However none of these studies have related these preferences to *actual* AP.

In addition, gender differences have also been found in both types of AP (Hyde and Lynn 1998). Women appear to prefer continuous AM (Furnham and Chamorro-Premuzic 2005a, b). As women are generally more conscientious than men and tend to outperform male students on measures of overall AP (Deary et al. 2007), but are not more intelligent, it is plausible that sex differences in both AP and preferences for continuous AM are mediated by personality (Furnham 2008). Additionally, this may explain why female students who are higher on Neuroticism than male students have been associated with a negative preference for all AM which clearly considerably increase their anxiety.

As no previous research has investigated whether differences in students' performance across different AM could be a function of personality traits the aim of this study was to examine the relationship between personality and two different, very well known AP AM: exam grades and coursework grades. The objectives were to investigate which personality traits would predict different AP AM and how much variance of each of the AP AM would be accounted for by personality traits. Because there is more choice and fewer constraints in how students' do coursework it was anticipated that personality factors would account for more of the variance in coursework as opposed to exams. It was also an aim of this study to see whether sex explains AP (on both AM) once personality is considered as it is known that there are systematic sex differences in personality (Feingold 1996).

It also set out to determine whether the predictive power of gender and the Big Five as determinants of AP is invariant across different types of programmes of study, that is students from different disciplines (i.e. arts, science, social science) and different institutions. Different disciplines attract students who differ in terms of their ability and personality. It was predicted the relationships between personality, gender and AP would be consistent across disciplines. There have been some studies in this area which have showed different personality profiles in different faculties (DiRienzo et al. 2010). For instance in a recent study of trait emotional intelligence in students across five faculties (art, humanities, natural sciences, social sciences, technical sciences) Sanchez-Ruiz et al. (2010) found consistent and predicted differences on students wellbeing, self-control, emotionality and sociability scales. This study will examine difference in four areas of study: humanities, as well as hard, life and social sciences.

Method

Participants

The participants were 1,013 second and third-year UK undergraduate students (662 female, 351 male) from a variety of academic disciplines (of the total sample; 12.5 % arts/humanities; 4 % architecture; 11.6 % law; 21 % social/historical sciences; 27.3 % life sciences/medicine; 3 % biomedical; 3.3 % engineering; 7.2 % mathematics/physics; and 7 % unknown). They ranged in age from 18 to 51 with a mean age of 21.33 years (SD = 3.76). All students were fluent in English and had completed their first undergraduate year in the U.K.

Measures

AP initially constituted the self-reported grades from the last academic year for three different AM: (1) Average grade last year; (2) Coursework (examinable coursework grade); (3) Exam grade. The best and worst grade so far and most recent grade (if different from best and worst

Table 1 Inter-correlations and descriptive statistics for target measures

	M (SD)	α	1	2	3	4	5	6	Gender
Exams	3.8 (.72)	.64	.42**	−.02	.15**	.13**	−.04	.04	−.14**
1 Coursework	3.8 (.69)	.60		−.05	.13**	.15**	−.04	.10**	−.14**
2 Extraversion	9.9 (2.6)	.74			.22**	−.03	−.20**	.27**	.01
3 Agreeableness	11.2 (2.1)	.54				.08**	−.09**	.19**	−.22**
4 Conscientiousness	9.6 (2.8)	.61					−.04	.06*	−.10**
5 Neuroticism	8.4 (2.7)	.73						−.06	−.17**
6 Openness	10.9 (2.3)	.71							−.00

$N = 1{,}013$; **$p<.01$; Gender coded 1 = female, 2 = male; scale for exams and coursework: *1* fail, *2* pass or third, *3* 2–2 or 50–59, *4* 2–1 or 60–69, *5* first or above 69. All measures assessed with 3-item self-reports

so far) were reported for the CW and EXAM. The Average grade AM indicated multicollinearity (tolerance values $> .2$, VIF $= > .4$) and was therefore excluded in the subsequent analyses. Research has indicated that self-reported AP is a reliable AM that correlates very highly ($r = .90$), with actual AP particularly in low-stake situations (Revelle 2007).

Personality traits are usually measured by the 60-item Neuroticism–Extraversion–Openness Five Factor Inventory (NEO-FFI; Costa and McCrae 1992), which assesses five personality domains; Neuroticism, Extraversion, Openness to experience, Agreeableness and Conscientiousness. Respondents rated the items on a 5-point Likert type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Confirmation of its psychometric properties has been reported elsewhere (e.g. Costa and McCrae 1992). In this study, the NEO-FFI was abbreviated to 15 items (3 items per NEO-scale) so as to more economically represent each factor without compromising the reliability of the measure considerably (see Table 1) (McManus and Furnham 2006).

Procedure

Data collection was part carried out via a purpose built web-portal that enabled the students to provide the required information (online versions of the AP and NEO-FFI, see Appendix A) in an anonymous, non-intrusive and pragmatic way. Students were also recruited in a number of social settings at four universities in London where the questionnaires were completed and collected at the time of the recruitment. Questionnaires were also administered to students in connection with lectures. Preliminary analysis (multivariate analysis of variance) showed that there was no significant difference in the results given by the two methods. Ethical approval was obtained for this study.

Results

Bivariate correlations

Table 1 reports the descriptive statistics and inter-correlations for all target measures. As seen, exam and coursework grades were positively correlated, and both correlated positively with Agreeableness and Conscientiousness. Openness correlated positively with coursework grades, and gender was negatively correlated with both coursework and exam grades (women did better than men). Although all these correlations were significant at

$p < .001$, they were very modest in size (except for the correlation between both AP measures).

Given that the Big Five personality traits were measured each by a 3 item scale the internal reliabilities (Cronbach's α) of the five are satisfactory and in accordance with previous studies using this scale. However the exception is Agreeableness with an α of only .54. It is not clear why this is the case unless some items were more prone to social desirability than others.

Structural equation modelling (SEM)

Next, SEM was carried out via AMOS 17 (Arbuckle 2008) to test a model with individual differences as predictors of AP. The choice of SEM over other methods, such as multiple regression, was based on three reasons. First, SEM allows for latent modelling, which, in the current study, would enable us to "distil" the variance attributable to a general factor of AP, whilst retaining the "pure" or specific factors of exam and coursework. Thus SEM makes it possible to examine the effects of individual differences on both AM whilst controlling for overall AP. Second, SEM takes into account the overlap among "exogenous" variables or predictors, enabling us to examine the unique effects of each personality trait on AP i.e. whilst controlling for its associations with other personality traits or gender; given the known inter-correlations among the Big Five personality traits (Chamorro-Premuzic and Furnham 2005) as well as the correlations between the Big Five and gender—this was an important aspect in the analyses. Third, SEM allows one to test whether an identified model adequately explains or fits the data for different groups by doing "multi-group analyses" or testing for the invariance of a model across different subsamples—in the current study, we were interested in comparing the fitness of the model across gender and different types of degrees.

Goodness of fit was assessed via the χ^2 statistic, the goodness-of-fit index (GFI) and its adjusted version (AGFI), as well as the root mean-square residual (RMSEA) and the parsimony goodness-of-fit index (PGFI) (Kelloway 1998; Loehlin 1987; Maruyama 1998).

The first hypothesized model included the Big Five as exogenous variables and a latent AP factor (on which the exam and coursework factors loaded) as endogenous variables. Inter-correlations were allowed in line with Table 1 and paths from all Big Five onto the latent factor of AP—but not the observed AM factors. The hypothesized model fit the data well: χ^2 (df = 10, N = 1,013) = 31.4, $p < .01$; GFI = .99, AGFI = .97, PGFI = .37, RMSEA = .04 (.03–.06). It should be noted that although the χ^2 value in well-fitting should, ideally, not be significant, significant χ^2 values are rather common in well-fitting models when the sample size is large (Byrne 2006). Individual path coefficients were mostly in line with past findings; Conscientiousness and Openness had positive effects on AP, whilst Extraversion and Neuroticism had negative effects, though the comparatively strong effect of Agreeableness on AP was somewhat surprising. Inspection of the modification indices revealed that none of the exogenous variables had significant effects onto the specific AP factors (coursework and exams) after the general AP variance was removed. In all, the Big Five accounted for 9 % of the variance in AP.

A second model, in which gender was added as an exogenous variable, was then tested. This model enabled gender to correlate with Neuroticism, Conscientiousness and Agreeableness (in line with Table 1) and hypothesized gender effects on AP. This model also explained the data well: χ^2 (df = 13, N = 1,013) = 32.7, $p < .01$; GFI = .99, AGFI = .98, PGFI = .38, RMSEA = .04 (.02–.05). Gender had the strongest effect on AP

and accounted for an additional 3 % of variance in AP. This model (as well as the one without gender) is depicted in Fig. 1.

Multi-group analyses

In order to test for the invariance of the first model (with Big Five as exogenous factors) across gender, we performed multi-group analyses. A prerequisite for assessing the invariant structure is to first stipulate and test a baseline model for each group individually. Such a model, which does not include cross-group constraints, should fit the data well in terms of both parsimony and theoretical relevance (Byrne 2006). For the female sample, the fit indicators were χ^2 (df = 10, n = 662) = 38.2, $p < 01$, GFI = .98, AGFI = .95, PGFI = .35, RMSEA = .06 (low = .04, high = .08). For the male sample, the fit indicators were χ^2 (df = 10, n = 351) = 32.8, $p < .05$, GFI = .97, AGFI = .95, RMSEA = .07 (low = .05, high = .08). Thus the baseline model was supported in both groups separately. Next, the unconstrained model was tested in both gender groups, showing good fit indices: χ^2 (df = 20, n = 351 males and n = 662 females) = 71.4, $p < .05$, GFI = .98, AGFI = .95, RMSEA = .05 (low = .03, high = .05). The final step of this analysis consisted of running a constrained model in both samples—all paths from the Big Five to AP were constrained, as well as the paths from exams and coursework onto the latent AP factor. The constrained model explained the data well χ^2 (df = 26, n = 351 males and n = 662 females) = .74.3, $p < .05$, GFI = .98, AGFI = .96, RMSEA = .04 (low = .03, high = .05), and the difference between the constrained and unconstrained models (χ^2 (df = 6) = 2.9, $p > .05$) was not significant, indicating that the model was invariant across gender. Inspection of the individual parameters showed that the Beta coefficients from Openness and Neuroticism to AP were identical for both samples, whilst the other three Big Five traits had similar effects across gender: Extraversion (−.12 and −.11), Agreeableness (.17 and .15), and Conscientiousness (.19 and .15) (for females and males, respectively).

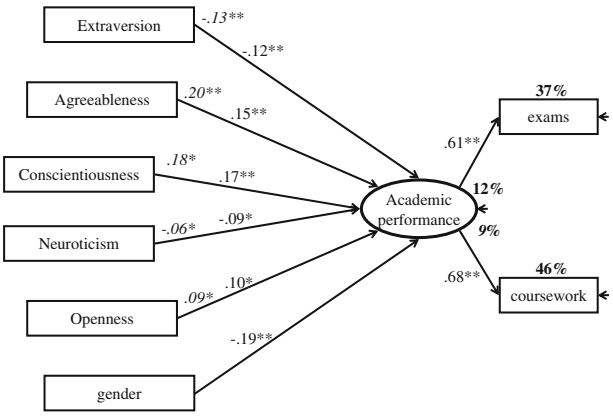

Fig. 1 Big Five and gender as predictors of AP. N = 1,013; all coefficients are SD. Betas significant at $^*p < .05$,$^{**}p < .01$; gender 1 = male, 2 = female; correlations (not shown): gender with Neuroticism (−.19**), Conscientiousness (−.09**), and Agreeableness (−.23**); Extraversion with Agreeableness (.21**), Neuroticism (−.17**) and Openness (.26**); Agreeableness with Openness (.17**); % are variance explained in exogenous variables (R^2); italic coefficients are for model without gender

A final set of multi-group analyses were carried out in order to test whether the model (with gender) was invariant across degree groups (type of studies). The four degree types compared were arts/humanities, social sciences, life/biological sciences, and math/science. One covariate had to be added to the baseline model (between Agreeableness and Neuroticism, $r = -.26$, $p < .01$) in order to explain the data for the arts/humanities sample. Table 2 presents the fit indices for the baseline, unconstrained, and constrained models, as well as the comparisons for each pair. As seen, there was no significant difference between the unconstrained and the constrained χ^2 values, showing that the model was invariant across degree types.

Discussion

Previous studies in this area have looked at personality correlates of totally academic outcomes, like GPA; as well as personality correlates of preferred AM (Poropat 2009, 2011; Furnham et al. 2011). The former found that Conscientiousness was the primary non-ability, trait correlate of overall AP while the latter found that Openness was the strongest correlate of essay preference. Conscientiousness was the strongest correlate of continuous assessment. This study looked at trait correlates of AP of an individual based on both coursework and traditional exams. Further, it explored whether any relationships were consistent across academic disciplines.

Overall the results showed, as may be expected, results from different exams as opposed to coursework positively and significantly correlated ($r = .42$). Whilst this correlation is

Table 2 SEM results

	Arts/humanities $n = 167$		Social sciences $n = 415$		Life/bio sciences $n = 298$		Maths/science $n = 133$	
Baseline								
χ^2 (df = 12)	24.3*		19.4		19.9		11.6	
GFI	.96		.99		.98		.98	
AGFI	.91		.97		.96		.96	
PGFI	.33		.34		.34		.33	
RMSEA	.07 (.03–.09)		.04 (.00–.06)		.05 (.00–.08)		.00 (.00–.06)	
	UC	*C*	*UC*	*C*	*UC*	*C*	*UC*	*C*
Paths onto AP								
Extraversion	−.19*	−.11**	−.08	−.11**	−.07	−.10**	−.13	−.09**
Agreeableness	.08	.16**	.09	.15**	.12	.13**	.24*	.14**
Conscientiousness	.30**	.17**	.08	.18**	.20**	.17**	16*	.16**
Neuroticism	−.10	−.06	.02	−.06	−.08	−.13	−.20*	−.06**
Openness	.09	.12**	.25*	.12**	−.06	.11**	.07	.10**
Gender	−.13	−.17**	−.11	−.16**	−.19**	−.14**	−.22*	−.15**
Unconstrained χ^2 (df = 48) 75.3*; GFI .98; AGFI .95; PGFI .34; RMSEA .03 (.01–.04)								
Constrained χ^2 (df = 69) 97.4*; GFI .98; AGFI .95; PGFI .34; RMSEA .02 (.01–.03)								
Difference (df = 21) 22.1								

UC unconstrained; *C* constrained

highly significant it does suggest that various other factors may influence candidate results on these different AM. However as Fig. 1 indicates the five traits seem to have very similar correlates of both methods (see Table 1). The correlational results were in accordance with earlier work on trait correlates of AP (O'Connor and Paunonen 2007; Poropat 2009, 2011) showing the importance of Conscientiousness. This, in part, validates the use of self-reported grades as used in this study as opposed to GPA records. Also it showed Openness, often said to be a proxy for, and the only major trait correlate of, intelligence (Furnham 2008) to be significantly correlated with coursework results.

However, what was different about these results was the relative importance of Agreeableness in both coursework and exams. Agreeable people are trusting, straightforward, altruistic and modest (Costa and McCrae 1992). Furthermore they are generous, sympathetic and considerate. It is possible that Agreeableness is correlated with academic success because agreeable people are good at giving, soliciting and receiving help both from their peers and their teachers. Students often study together, help explain things to one another and give other resources to help those who they like, and who help them. Furthermore they support each other emotionally at assessment time. Agreeableness is a correlate, but not the only one, of friendship networks (Furnham 2008) and this may facilitate help with, and success in academic work, particularly course-work; where students can easily enlist the help of others. Equally Disagreeable people are critical, competitive and sceptical with a tendency to immodest hubris. They may be disliked both by their peers and their teachers and thus disadvantaged in assessment. Previous studies on personality correlates of AP or AM preference have not tended to show strong correlates with Agreeableness so this result requires replication.

The results in figure one show three things. First, that overall the trait correlates of results were in accordance with the previous literature using actual (not self-reported) results usually GPA (Poropat 2009). As always Neuroticism was modestly, but negatively, correlated with results, and Conscientious and Openness positively. The two less common results were for Agreeableness (discussed above) and Extraversion. Extraversion was reasonably strongly negatively correlated with academic success. In his review of over a hundred samples and an *N* just short of 60,000 Poropat (2009) also found extraversion negatively correlated with AP. The correlations were also similar to those suggested by Wolf and Ackerman (2005) in their meta-analysis but the path coefficients were stronger. It has been suggested that the correlation between extraversion and academic success changes with age but positive at primary school, to zero at high school and negative at university (Chamorro-Premuzic and Furnham 2005). It is possible that Extraverts distractibility, preference for socialising, poor vigilance and weaker long term memory means they underperform at university compared to introverts. Extraverts like to be examined by oral exams and like presentations and group work but may concentrate too much on the wrong things to do particularly well (i.e. presentation over content) (Furnham et al. 2011).

Second the results confirm the well established finding that females outperform males in exams. This is a particular interesting finding given the data from many studies suggest that whilst there is little evidence of sex differences in intelligence those who score particularly high *and* low tend to be male (Jackson and Rushton 2006; Johnson and Bouchard 2007).

Third, it is interesting that the personality variables accounted for more variance in course work as opposed to exams. Individual differences operate more obviously in less constructed situations. Course work offers the possibility of students choosing where, when

and with whom to work while exams are much more constraining. Furthermore personality factors are linked to a preference for course work as opposed to exams.

The final interesting and unique result from this study concerns differences between the different disciplines. Academic disciplines tend to emphasis different skills and outcomes. Thus memory and crystallised intelligence may be more important in the arts than the sciences, while mathematical sciences require more fluid intelligence and the life/biological sciences more ability to demonstrate specific technical skills. Speech, drama and music require performance skills as do law: that is practitioners have to perform in public showing their skill (their ability to play an instrument; memorise and deliver lines, argue) as well as their knowledge.

There are personality correlates of vocational choice but this study examined personality correlates of academic success across four disciplinary groupings. The results, shown in Table 2 were clear with the pattern being very consistent across four faculties, particularly for Conscientiousness. Extraversion was a consistent negative and Agreeableness and Openness consistent positive correlates of success irrespective of the discipline chosen by the participant. There were however two interesting exceptions. First, Neuroticism was a consistent negative correlate of AP across the disciplines but it only attained significance level in the Mathematical sciences. This maybe because these disciplines use exams more frequently in which neurotics perform poorly. Next males tended to do worse in all courses except the social sciences.

This paper demonstrated that personality traits are linked to AP consistently irrespective of the discipline of candidates or whether the grades are self-reported or "objectively" recorded. It did however show two interesting findings. The first is the role of Agreeableness which also emerged in Poropat's (2009) Meta analysis. Thus whilst Extraversion and Neuroticism play less important roles Conscientiousness, Openness and Agreeableness are clearly linked to AP. The second was that personality traits play a more important role in course work, rather than exam results. Coursework marks often show a wider range than exams but this was not apparent in this study. It would be worth investigating whether ability factors play a larger part than personality trait factors when AP is measured by an exam rather than coursework.

This study had several limitations. It used a short personality trait measure and self-reported grades. Little was known about participant academic career history or their attitudes toward assessment. Nevertheless it added to the increasing literature at the interface of differentiated and educational psychology on individual difference predictors of AP. It would be most interesting to get students from different subject areas, faculties and departments to all complete the same exam and see how personality traits like the Big Five, trait emotional intelligence etc. related to that actual performance.

What are the implication of this, and related studies, for pupils and students, teachers and lecturers as well as schools and universities? Personality and intelligence effects partly how students prepare for assessment as well as how they perform in exams and coursework exercises. Over time students get feedback on their performance as well as experience of assessments which leads them to having strong preferences for the way in which they are assessed. These preferences in turn may have self-fulfilling consequences for their actual performance and influence their choice of discipline/subject as much as their intrinsic interest in the course. Educational institutions are ever eager to demonstrate that their AM are reliable, fair and relevant to what is being taught. Understanding individual differences in AM preferences and performance may encourage some teachers and institutions to offer choices in AM that both fairly and accurately measure a students' ability and effort.

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