Relation between Type of Personality and Academic Performance among Malaysian Health Sciences Students

ORIGINAL

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Abstract

Background: This study was carried out to determine the relationship between types of personality and level of academic performance among health sciences students in Malaysia.

Methods: A total number of 246 students were participated in this study. The questionnaire was distributed randomly from students of each semester. Data were entered and analyzed using PASW Statistics Version 18.0. Relationship between GPA and BFA were analyzed using the multiple linear regressions. The Spearman's correlation, multiple linear regression were used in this study. Findings were presented with adjusted OR, 95% CI and p-value.

Results: The majority of the study participants were single (98%), Malay (62.2%). This study revealed that the most dominant personality trait was openness (32.8 ± 5.1) and the least dominant was neuroticism (23.9 ± 4.4). Spearman's correlation analysis showed that there was correlation between GPA and the following types of personality: openness ($p=0.001$), conscientiousness ($p<0.001$), extraversion ($p=0.018$). Multiple linear regression analysis showed that openness and conscientiousness personalities were positively associated with academic performance ($p=0.047$, $p=0.036$; respectively).

Conclusion: Our study, for the first time, assessed the relationship between types of personality and level of academic performance among health sciences students in Malaysia. Openness and conscientiousness personalities were found to be positively associated with academic performance.

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Introduction

Research on personality and its relationships to important personal, social and economic constructs is as vibrant and influential as ever [1], and such research has allowed researchers to assess the major features of these relationships, providing guidance for future studies including the relationship between personality and academic performance. The Big Five framework of personality traits [2] has emerged as a robust and parsimonious model for understanding the relationship between personality and various academic behaviors [3]. The Five-Factor Model (FFM) of personality, which is made up of the dimensions of agreeableness (reflecting likeability and friendliness), conscientiousness (dependability and will-to-achieve), Emotional Stability (adjustment versus anxiety), extraversion (activity and sociability), and Openness (imaginativeness, broad-mindedness and artistic sensibility), has been found important in the regard of academic performance [1, 2]. Among these five factors, conscientiousness has consistently shown a positive relationship with test performance, grades, or Grade Point Average (GPA) [4-6]. Nofle and Robins [6] reported that conscientiousness is the strongest predictor of academic performance because conscientious students are believed to be more organized, careful, precise, energetic, and selfdisciplined. However, there is some evidence that personality and motivation are intricately tied with individual differences in learning styles, and it is recommended that educators go beyond the current emphasis on cognition and include these variables in understanding academic behavior [3, 7]. The dominant measures of academic performance are grades and, especially, grade point average (GPA). In some countries, all grades from all current classes are averaged to create a GPA for the marking period. The GPA is calculated by taking the number of grade points a student earned in a given period of time of middle school through high school. The GPA can be used by

potential employers or educational institutions to assess and compare applicants. A Cumulative Grade Point Average is a calculation of the average of all of a student's grades for all of his or her complete education career [8]. GPA as attested by their frequent use as criterion variables in research [9]. Despite their common use, the reliability and validity of grades and GPA have been questioned because of factors such as grade inflation, which is the tendency to provide higher grades for the same substantive performance at different levels of study, or at different periods in time [10]. Grade inflation can be problematic when it reduces comparability between grades that are subsequently integrated into GPA [10] or produces ceiling effects (i.e., grades crowding into the upper limit of the grading range), resulting in range restriction and disrupted rank-ordering [11], as well as non-normal distributions. These effects will tend to reduce observed correlations.

Many researchers reported that personality traits influence academic achievement. For instance, conscientiousness has consistently emerged as a stable predictor of exam performance [12] and GPA [13]. Combinations of Big Five traits have also been found to predict various educational outcomes. Specifically, conscientiousness and openness predict course performance [14], while agreeableness, conscientiousness, and openness predict overall academic performance [15]. Extraversion, openness, and conscientiousness have also been found to predict GPA, especially when students apply previously accumulated knowledge to real life settings [16]. In contrast, neuroticism or emotional instability is negatively associated with academic achievement [12]. In addition to the Big Five, other traits such as grit or perseverance [17] are also predictive of academic performance. Although these findings confirm the general significance of personality traits, there remains a need to examine other individual level factors such as students' learning styles [3]. The FFM dimensions

have been replicated in an impressive series of studies, across raters and rating scales, but also in different countries and cultures [2, 18]. The FFM dimensions and their operational manifestations primarily represent the normal range of individual differences, contrary to many clinically developed personality descriptive models, making the model suitable for studying traits and samples derived from the general population [19]. The FFM may serve as a uniform, comprehensive and robust framework for describing medical, medical sciences and biomedical students' personality characteristics and for substantially advancing our understanding whether these traits relate to academic success [19, 20]. Therefore, this study was carried by using the FFM of personality to assess the relationship between types of personality and level of academic performance among the health sciences students of two faculties in the Management and Science University, Malaysia.

Methods

Study setting and sample

A research on the relationship between types of personality and level of academic performance was conducted among the health sciences students in the Management and Science University, Malaysia: namely, Bachelor in Medical Science (BMS) and Bachelor in Biomedical Science (BBM). A total number of 250 students were chosen randomly to participate in the survey. However, only 246 completed questionnaires had been returned and 4 questionnaires were missing because respondents did not return back the survey. The study was approved by Ethics committee of in the Management and Science University, Malaysia. The questionnaire consisted of three parts, socio-demographic, academic performance (GPA) and personality types. The questionnaire was distributed by choosing random students from classes of

each semester. The respondents who were interested to know their personality type, they were asked to leave their contact number at the end of the questionnaire. The results were informed by text messages. The personality traits of the sample population were measured by the Big Five Inventory (BFI) framework by John et al. [21]. BFI is a 44 – item test that provides a score for each of the Big Five personality traits named conscientiousness, agreeableness, neuroticism, extroversion and openness. Scores on these traits can often explain important issues for adults and thus simplify their attitude towards learning activity. The item response scales ranged from 1 (strongly disagree) to 5 (strongly agree). The questionnaire is distributed within a week. Calculation was done according to a formula used to determine the personality trait which will be then linked to the academic achievement by correlating it to the previous CGPA attained by the student.

The proposal of this study was approved by the ethics and research committee at MSU. Self-administered questionnaire was used. Verbal consent was obtained from the study subjects. Instruction and information about the study were given to all the participants.

Data analysis

Data were entered and analyzed using PASW Statistics Version 18.0. Relationship between CGPA and BFA were analyzed using the multiple linear regressions. The Spearman's correlation was used since the relation between CGPA and BFI is non-linear. The stepwise, backward and forward regression has been applied to identify the significant factors of BFI by controlling all possible confounders, and developed the best fitting model for the associated factors of BFI. Findings were presented with adjusted OR, 95% CI and p-value. A p-value of less than 0.05 was judged to be statistically significant.

Results

A total number of 246 university students participated in this study. The majority of them were single 241 (98%), their age 22 years or more 169 (68.7%), Malay 153 (62.2%), from Bachelor in Medical Sciences (BMS) 148 (60.2%), with family income less than 5,000 Malaysian Ringgit 158 (64.2%) and from urban area 168 (68.3%) (**Table 1**). This study showed that the most dominant personality trait was openness (32.8 ± 5.1) and the least dominant was neuroticism (23.9 ± 4.4) (**Table 2**). **Table 3** shows the significant correlations of sociodemographic variables, GPA, CGPA and types of personality disorder. Spearman's correlation analysis showed that there is correlation between GPA and the following types of personality: openness ($p=0.001$), conscientiousness ($p<0.001$), extraversion ($p=0.018$).

However there is no correlation between GPA and other types of personality namely: agreeableness ($p=0.424$) and neuroticism ($p=0.799$) (**Table 3**). Multiple regression analysis showed that openness and conscientiousness personalities positively associated with academic performance ($p=0.047$, $p=0.036$; respectively) (**Table 4**).

The personality type of conscientiousness, extraversion and monthly family income were the significant predictor factors for academic performance among health sciences students in the Management and Science University, Malaysia. An increase of 0.140 conscientiousness score, 0.209 of extraversion score and RM 0.164 of family income was found to increase the academic performance (GPA) by one score (**Table 5**).

Table 1. Socio-demographic characteristics of the study participants (N=246).

Variable	Categorize	Number (%)
Marital status		
	Single	241 (98)
	Married	5 (2)
Age group		
	<22	77 (31.3)
	≥22	169 (68.7)
Race		
	Malay	153 (62.2)
	Non-Malay	93 (37.8)
Course		
	BMS	148 (60.2)
	BBM	98 (39.8)
Family monthly income		
	<5000	158 (64.2)
	≥5000	88 (35.8)
Residency		
	Rural	78 (31.7)
	Urban	168 (68.3)
GPA		
	B- (2.33-2.66)	6 (2.8)
	B (2.67-2.99)	28 (13.3)
	B+ (3.00-3.32)	68 (32.2)
	A- (3.33-3.66)	64 (30.3)
	A (3.67-4.00)	45 (21.3)

Table 2. Descriptive analysis of the type of personality among the study participants (n=246).

Variable	Mean (SD)
Openness	32,8 (5,1)
Conscientiousness	28,2 (4,1)
Extraversion	26,1 (4,5)
Agreeableness	30,8 (4,5)
Neuroticism	23,9 (4,4)

Table 3. Antibiotic resistant pattern of potential pathogenic bacterial isolates cultured from the nasopharynx of SCD subjects at the Wesley Guild Hospital, Ilesha

	Age	Race	GPA	CGPA	F M Income	Residency	Openness	Conscientiousness	Extraversion	Agreeableness	Neuroticism	Courses	Quinolones	Fluoroquinolones	Nitrofurantoin
Age												0.148*	5 (100)	3 (60)	3 (60)
GPA				0.770**	0.135*			0.158*	0.214**				4 (100)	0	0
CGPA	-0.008	-0.082	0.770**				0.202**	0.211**	0.151*				4 (100)	0	0
Family Monthly Income			0.135*			0.162*						-0.244**	3 (100)	0	0
Residency					0.162*								2 (100)	0	0
Openness				0.202**				0.372**	0.395**	0.353**		-0.127*	5 (100)	3 (60)	3 (60)
Conscientiousness			0.158*	0.211**			0.372**		0.207**	0.367**	-0.183**	-0.146*	4 (100)	0	0
Extraversion			0.214**	0.151*			0.395**	0.207**					4 (100)	0	0
Agreeableness							0.353**	0.367**		-0.142*		-0.164**	3 (100)	0	0
Neuroticism								-0.183**		-0.142*			2 (100)	0	0
Courses	0.148*				-0.244**		-0.127*	-0.146*		-0.164**			5 (100)	3 (60)	3 (60)
* Correlation is significant at the 0.05 level (2-tailed).							** Correlation is significant at the 0.01 level (2-tailed).								

Table 4. Multiple linear regression of personality and GPA.

Predictors	B	β	R ²	F	P-value
Conscientiousness	0.013	0.140	0.099	8.87	0.027
Extraversion	0.018	0.209			0.001
Family monthly income	0.131	0.164			0.008

Table 5. Predictor factors of academic performance among health sciences students in the Management and Science University, Kuala Lumpur.

Variables	SLR ^a		MLR ^b		
	B	P value	Adjusted b (95%CI)	t statistics	P value
Conscientiousness	0.132	0.069	0.140	2.225	0.027
Extraversion	0.222	0.001	0.209	3.315	0.001
Family monthly income	0.127	0.015	0.164	2.689	0.008
a: Simple linear regression, b: multiple linear regression			R ² =0.099. The model reasonably fits well. Model assumptions are met. There are no interaction and multicollinearity problem.		

Discussion

The results of this study agree in many ways with previous research on personality types and achievement in university. This study provides clear evidence of the importance of the Big Five personality factors in predicting academic performance, lending support to the previous findings by many researchers [22-24], and conscientiousness appeared to be a very strong predictor of all academic performance measures and the strong direct relationship between conscientiousness and performance is probably the only one of the Big Five factors, that has been observed across various settings and with all types of performance measures [22]. Most studies showed that conscientiousness is one of the most significance predictors of academic achievement [25, 26]. While in previous studies it was confirmed that the factor conscientiousness is a predictor for the academic performance of the students with technical profile [27]. Likewise, conscientiousness has been shown to be a predictor of academic motivation and academic achievement in traditional class settings [28].

This finding is consistent with the previous studies [29-31]. Similarly, McIlroy and Bunting [32] found that conscientiousness was significantly and positively related to academic performance. Several other researchers have supported our results [14, 31, 33]. The positive association between academic performance and conscientiousness may be simply attributed to the hardworking, organized and ambitious nature of highly conscientious individuals. The possible explanation could be that medical and medical sciences students selected who are able to get into good universities. Our results establish that being conscientious is critical for learning and performance. Thus, conscientiousness appears to facilitate a variety of effective learning strategies and may be an especially useful trait for attaining high levels of academic achievement.

In current study conscientiousness accounted for 28.2% of variance in academic performance; however, in another study, Furnham et al. [34] found that conscientiousness accounted for 19% of the variance in academic performance, a finding that underscores the predictive nature of the Big Five

trait of conscientiousness to academic performance. On other hand, extraversion and openness have also been found to predict GPA, especially when students apply previously accumulated knowledge to real life settings [16]. In contrast, neuroticism or emotional instability were negatively associated with academic achievement [12]. In current study we found that neuroticism was the lowest among other variants (23.9%). This confirmed the previous findings which reported there is an inverse relationship between neuroticism and performance, for the GPA measure. This leads to the conclusion that, as many scholars proposed, neuroticism has a negative effect on performance, by creating negative emotions, withdrawal tendencies and a negative reaction to the fear of failure [22-24, 26]. Instructors and students should be made aware of the impact of personality on learning so they can modify teaching styles and learning behaviors. Science instructors can use a variety of teaching activities in their courses to help motivate the different personality types. As teachers we need to emphasize the valuable types of personality, and the learning environment in each course may favor one type over another so that some students will have to modify their attitudes and study skills if they are to succeed. Obviously, our study has some limitations. The study did not take into account other variables that could influence achievement, such as student background in the sciences or years of college completed. Nevertheless, the results of our study, for the first time, assessed the relationship between types of personality and level of academic performance among health sciences students in Malaysia. Personality assessment may serve a useful tool in student counseling and guidance. Future research might examine conscientiousness in finer detail by using longer, more detailed scales or seek to determine exactly what components of conscientiousness contribute to better academic performance.

Conflict of interest

The authors have no personal, professional, or ethical conflict of interest in the publication of this study.

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