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Academic Motivation and the Big Five

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Abstract
The objective of this study is to explore the relationship between the Big Five personality traits and the individual differences in the academic motivations of university students in order to develop more effective teaching strategies. 188 first-year university students were asked to complete questionnaires containing the Academic Motivations Inventory and the NEO Five factor Inventory. The results revealed an intriguing complex of relationships among the Big Five traits and the 16 subscales of the Academic Motivations Inventory. Factorial analysis revealed three underlying groupings of these subscales which are labeled escapism, commitment and performance. The association between these groupings and personality traits were refined further by means of multiple regressions. Escapism was best explained by extraversion, neuroticism and by an inverse relationship with openness to experience and conscientiousness. Of the remaining two, performance was best clarified by conscientiousness, neuroticism, and openness to experience; commitment by openness to experience and extraversion. Results are interpreted in terms of making optimal choices between teaching practices and academic motivations of the students, the range of which is due to the differences in personality traits. Recommendations for future research and educational methodologies are provided.

Keywords: academic motivation, the big five, openness, conscientiousness, extraversion, agreeableness, neuroticism, intrinsic motivation, extrinsic motivation, a motivation

INTRODUCTION

Different individuals have different educational preferences and learning styles. These individual differences provide significant suggestions about ultimate design of educational processes. The degree of motivation students exhibit in the classrooms also differ. Some students enthusiastically disclose an intrinsic desire to learn more while others appear to be bored and aloof. Various factors may be considered for explaining these differences (Stipek, 2002). While individual differences in academic achievement and academic success, learning styles have been investigated widely in literature, few studies have concentrated on individual differences in academic motivation. It must be remembered that academic motivation is a key ingredient of academic performance and should be investigated closely (Linnenbrink & Pintrich, 2002). This study was designed to establish the extent to which individual differences in academic motivation are influenced by the Big Five personality traits.

BACKGROUND

There are several approaches to learning behavior that emphasize the relationship between personality and motivation. First, research on multiple types of intelligence revealed that students who are taught in a way that matches their abilities are likely to attain superior results (see, e.g., Gardner, 1983 ; Strenberg, Torff, & Grigorenko, 1998) . Secondly, it has been established that students can be either intrinsically or extrinsically motivated, with some students exhibiting intellectual curiosity while others remain detached (Deci & Ryan, 1985). Thirdly, research on learning styles indicate that students approach learning with either a surface, deep or achieving style (Biggs, 1993). Fourthly, Dweck and Legget (1998) established a socio-cognitive approach to motivation and personality. And lastly, Elliot & McGregor (1999) pointed out that anxiety can alter learning goals and performance. Combined, these approaches suggest that academic environment, academic motivation and learning preferences shaped by personality to a large extent should commensurate.

LITERATURE REVIEW

While a number of studies have examined individual differences in academic performance, most have focused on academic achievement rather than motivation. Moreover, much of the existing research focused on high school students rather than university (Komarraju, Karau, & Schmeck, 2009). The research on the relationship among academic performance, personality and motivation may be classified into (a) personality and motivation, (b) personality and learning styles, (c) personality and academic performance.

Personality and Motivation: Some studies have investigated personality traits that may be related to some aspects of academic motivation . These studies have taken aspects such as test anxiety, performance goals, achievement motivation and related these academic performance. For example, Heaven (1989) stated that achievement motivation was positively correlated with extraversion and negatively with

impulsiveness and psychoticism among high school students. Busato, Prins, Elshout, & Hamaker (1999) reported that conscientious and extraverted students favored meaning, reproduction and application directed learning styles and were more achievement oriented. Contrary to this, students high on neuroticism and fear of failure revealed low achievement motivation, displayed preferences for an undirected learning style and had difficulty distinguishing and processing important material from trivial. Dweck & Legget (1988) reported that students who regarded intelligence as something rigid adopted performance-related goals and gave up when exposed to problems. On the other hand, students who regarded intelligence as malleable adopted learning goals and persisted when they faced difficulties. Kanfer, Ackerman, & Heggestad (1996) observed that the need for achievement was positively correlated with motivation and test anxiety was again positively related to test anxiety. While investigating the relationship between test anxiety and personality traits, Elliot & McGregor (1999) found that students with performance-avoidance goals were more likely to perform poorly on exams.

Personality and Learning Styles: Self-confidence and self-esteem emerge as two traits that explain individual differences in learning styles. Studies by Abouserie (1995) and Schmeck & Geisler-Brenstein (1991) revealed that students with high self-esteem and high achievement motivation favored a deep-processing learning style. On the other hand, students with low self-esteem and self-doubt preferred a surface-processing style. Along the same lines, Livengood (1992) disclosed that students who had high confidence in their intelligence preferred mastery rather than performance goals and preferred instructors who insisted on mastery.

Another issue that may be included under the same heading is the learning environment being designed according to individual differences. Furnham (1992) established that introverts tended to be more reflective whereas extraverts were more active. Individuals low on psychoticism utilized systematic processing however, those who were high on psychoticism preferred to evaluate information intuitively. In other studies, it was found that neurotic students preferred a surface-learning style but those who were conscientious and open-to-experience preferred a deep-learning style emphasizing mastery (Zhang, 2002, 2003) . Agreeableness was related negatively with academic performance. Considering thinking styles, neuroticisms was strongly associated with thinking styles that emphasized structured environments, whereas openness was positively related with thinking styles that emphasized being open-minded and perceptive. The significance of having preferred learning styles matching complementary teaching techniques was highlighted in other studies (e.g. De Raad & Shouwenburg, 1996; Riding & Wigley, 1997; Vermetten, Lodewijks, & Vermunt, 2001) .

Personality and Academic Performance : It has been established that the Big Five personality traits encompass the fundamental features of human personality and influence the human behavior strongly(Costa & McCrae, 1992). The role of the Big Five in predicting academic success have been studied widely in literature. Conscientiousness has consistently and positively predicted examination performance (Komarraju, Karau, & Schmeck, 2009) , as well as grade point average and academic success (Busato, Prins, Elshout, & Hamaker, 2000).

Lounsbury, Sundstrom, Loveland, & Gibson (2003) claimed that openness to new experiences was positively associated with academic achievement, with high-achievers employing critical thinking as a learning strategy . According to Chamorro-Premuzic & Furnham (2003) , reduced academic performance might be related to neuroticism and Farsides & Woodfield (2003) maintained that the key to getting good grades is agreeableness. Entwistle & Entwistle (1970) determined that introverts using suitable study methods achieved higher performance than extraverts or emotionally unstable students. Furthermore, Furnham & Medhurst (1995) established the existence of a positive correlation between sociability and academic performance among students.

Social and emotional factors have also been scrutinized in the literature. According to a study by Pritchard & Wilson (2003), perfectionists had superior academic achievements and tended to continue their education whereas students with low self-esteem were more likely to quit studying. Negative correlations between emotional instability and academic performance have been highlighted in other studies as well (e.g. Furnham & Mitchel, 1991 ; Heaven, Mak, Barry, & Ciarrochi, 2002) . Lounsbury et al. (2003) asserted that work-drive accounted for variances in academic performance significantly, beyond that explained by the Big Five and intelligence.

CURRENT STUDY

Valuable information has been provided in the literature on relationships among certain aspects of academic motivation such as performance goals and learning styles and various personality traits. However, very little research has been conducted on the relationship between the Big Five personality traits and multiple academic motives. This study was designed to fill this gap by directly examining the relationship between the Big Five personality traits and academic motivation. Multiple aspects of academic motivation were measured by Academic

Motivations Inventory (AMI , Doyle & Moen, 1978; Moen & Doyle, 1977) by means of 16 subscales covering a wide range of academic motivations.

The premise on which this study is built is the perspective that the extent of the match between the academic environment and the personality of a student determines the degree of motivation of the student. This approach is consistent with previous research such as the theory on intrinsic motivation (Deci & Ryan, 1985) , individual differences in learning styles (e.g., Biggs, 1993), intelligence (Dweck & Legget, 1988) , and multiple intelligence (Gardner,1983). Our hypotheses on the extent of the relationship between the Big Five personality traits and academic motivations are based on the known characteristics of academic domains as well as on prior research on personality.

HYPOTHESES

It is hypothesized that:

1. Conscientiousness would be positively related with persisting, achieving, and desire for self-improvement since conscientious individuals tend to be organized, disciplined, hard-working and they have been found to achieve greater academic success relative to others (Busato et al., 2000).
2. The personality trait of openness-to-new-experiences would be positively related with thinking and desire for self-improvement, as individuals open-to-new-experiences pursue original experiences, are intellectually curious and may be more interested in innovative educational experiences (Lounsbury, Sundstrom, Loveland, & Gibson, 2003).
3. As extraverted individuals would be more assertive (Costa & McCrae, 1992), it may be predicted that extraversion would be related with influencing motives.
4. Extraversion and agreeableness would both be positively related with approval and affiliating dimensions since agreeable individuals would more likely to be trusting and cooperative and may enjoy collaborative efforts (De Raad & Shouwenburg, 1996), and since extraverted individuals are warm, socially oriented and assertive, it may be predicted that extraversion and agreeableness would both be positively related with approval and affiliating dimensions.
5. Neuroticism would be positively related with the AMI motives of debilitating anxiety, withdrawal, disliking school and being discouraged about school since emotional distress and poor impulse control are two main characteristics of neuroticism, individuals high in neuroticism would have difficulty in handling academic challenges and dealing with setbacks (cf. Elliot & McGregor, 1999).

METHOD

Participants

Participants consisted of 188 first-year undergraduate university students enrolled in various departments of a non-profit, private university in İstanbul, Turkey. The ages of the students varied between 18 to 20. As the language of instruction is English , the scales used were in English as well . The native language of the students was Turkish and English was their second language with levels ranging from intermediate to advanced.

The breakdown according to departments and gender is given in table 1:

Table 1: demographics – breakdown according to the departments and gender

Year		Departments												total
		Arts & Sciences		Bus. Admin.		Communic.		Engineer.		Architec.& design		law		
2014	Gender	male	fem	male	fem	male	fem	male	fem	male	fem	male	fem	
	number	19	17	15	13	12	19	25	21	12	13	14	8	
	sum	36		28		31		46		25		22		188
	%	19		15		16		24		13		13		100

92% of the students were first-year and 8 % were second and third year students.

THE INSTRUMENTS – QUESTIONNAIRE AND INTERVIEWS

Both quantitative and qualitative approaches were employed.

The Big Five Personality Traits Questionnaire

The five major domains of personality , openness to new experiences, conscientiousness, extraversion, agreeableness, and neuroticism were assessed by the NEO-FFI , a 60-item scale with well-established reliability, validity and internal consistency (Costa & McCrae, 1992). The Cronbach's α values for the present study are given in table 2. Openness to new experiences implies intellectual curiosity and preference to variety. Conscientiousness encompasses being organized, purposeful, and self-regulated. Extraversion refers to sociability, talkativeness and assertiveness. Agreeableness may be defined as being sympathetic, helpful, trusting and cooperative. Neuroticism comprises emotional stability, impulse control, and ability to cope with stress.

Table 2 – Cronbach's α values for the current study

Trait	Cronbach's α
Openness	0,74
conscientiousness	0,84
extraversion	0,69
agreeableness	0,76
neuroticism	084

The Academic Motivations Inventory

The 90 item Academic Motivations Inventory - AMI (Moen & Doyle, 1977), assesses individual differences in 16 academic motivations. Prior research indicates that the AMI has acceptable reliabilities on almost all scales (Doyle & Moen, 1978) and offers validity against similar instruments and academic performance. (Church & Katigbak, 1992; Doyle & Moen, 1978; Moen & Doyle, 1977). Table 3 provides a brief description and the α values for each subscale of the current study.

Table 3 – descriptions and α values for AMI subscales

Motive	Brief description	No. of items	α
Thinking	Enjoys thinking and analyzing	9	0,78
Persisting	Tends to keep working until done	3	0,72
Achieving	Enjoys hard work and success	5	0,92
Facilitating anxiety	Anxiety that helps learning	3	0,64
Debilitating anxiety	Anxiety that interferes with learning	5	0,78
Grades orientation	Aims for good grades	7	0,72
Economic orientation	Focuses on career development	4	0,65
Desire for self-improvement	Desire to increase competence	6	0,68
Demanding	Wants good teaching	5	0,66
Influencing	Enjoys arguing with and influencing others	4	0,74
Competing	Wants to do better than others	3	0,76
Approval	Seeks to do well for being praised by others	9	0,84
Affiliating	Enjoys being with others in the university	4	0,62
Withdrawing	Prefers to work alone	6	0,71
Disliking	Lack of interest in studying	4	0,77
Discouraged about studying	Feels studying is too hard	7	0,78

PROCEDURE

The 188 students were asked to complete the demographic data, the Five Factor Inventory (NEO-FFI), and the Academic Motivations Inventory (AMI) . The AMI and the NEO-FFI were used for the quantitative part of this study. The procedure was administered in the spring term of 2014 during class-time and the students were asked to respond individually. They were given to understand that their answers were going to remain confidential. Ethical standards to protect the rights of the participants were observed throughout the study.

For the qualitative analysis, a number of students were recruited to participate in individual interviews for obtaining more detailed responses across a range of questions posed in the surveys. A total of 24 students offered their perspectives during the interviews and focus group sessions.

RESULTS

Factor Analysis

A principal components analysis of the sixteen subscales of the Academic Motivations Inventory was conducted in order to elucidate the complex pattern of correlations. Three factors with eigenvalues 5.28, 3,02 and 1,92 emerged, explaining 57% of the variance. The first factor, named escapism, comprised 6 subscales with α = 0,72, the second, named commitment, encompassed again 6 subscales with α = 0,79, and the third, named performance, covered 4 with α = 0,82. The factor of escapism incorporated the subscales of debilitating anxiety, economic orientation, demanding, withdrawing, disliking studying and discouraged about studying . The factor of commitment integrated the subscales of thinking, facilitating anxiety, desire for self-improvement, influencing, approval and affiliating. Thirdly, performance included the subscales of persisting, achieving, grades orientation and competing.

Correlation Analysis

Consistent with predictions, correlation analyses established a number of significant relationships between the Big Five personality traits and the 16 subscales of the Academic Motivations Inventory, as displayed in table 4:

Openness to experience was positively related with thinking, persisting, achieving, desire for self improvement, influencing and affiliating motives and was negatively related with economic orientation, withdrawing, disliking studying and feeling discouraged. Similarly, conscientiousness was positively associated with thinking, persisting, achieving, grades orientation, influencing, and affiliating and negatively associated with debilitating anxiety, disliking studying and feeling discouraged. Extraversion was positively related with persisting, facilitating anxiety, grades orientation, economic orientation, desire for self-improvement, influencing and affiliating and was negatively associated with withdrawing. Agreeableness was positively associated with persisting, grades orientation, desire for self-improvement and affiliating and was

positively related with competing. Finally, Neuroticism was positively related with , debilitating anxiety, economic orientation, approval and withdrawing and was negatively related with facilitating anxiety and influencing

Table 4 – Correlations between the Big Five personality traits and the subscales of the AMI (p < 0,5)

AMI subscale	Openness	conscientiousness	extraversion	agreeableness	Neuroticism
Thinking	0,49	0,28	0,21	-0,09	-0,21
Persisting	0,23	0,78	0,37	0,27	-0,23
Achieving	0,27	0,65	0,17	0,14	-0,16
Facilitating anxiety	0,15	0,21	0,27	0,07	-0,19
Debilitating anxiety	-0,08	-0,22	0,02	-0,09	0,58
Grades orientation	0,16	0,36	0,16	0,29	0,29
Economic orientation	-0,24	0,15	0,31	0,17	0,32
Self-improvement	0,50	0,14	0,32	0,28	-0,07
Demanding	-0,06	-0,06	0,09	0,08	0,25
Influencing	0,32	0,26	0,41	-0,16	-0,22
Competing	-0,05	0,23	0,14	-0,24	0,09
Approval	0,12	-0,03	0,21	0,16	0,28
Affiliating	0,29	0,19	0,46	0,22	0,07
Withdrawing	-0,39	-0,16	-0,32	-0,08	0,55
Dislike studying	-0,27	-0,67	0,18	-0,11	0,23
Discouraged	-0,25	-0,53	0,05	0,16	0,56

Regression Analysis

The relationship among the five personality traits and each of the three motivation factors were investigated with forward multiple regression analyses. The Big Five personality traits were used as predictors and each one of the three factors as dependent variables. The predictors were listed according to their power of explanations . The significant predictors from each regression model are given in table 5 :

Table 5 – Multiple regression with the Big Five regressed on three academic motivation factors : (p < 0,5)

Factor	Sequence	predictor	β	R^2	Change in R^2
performance	1	Conscientiousness	0,68	0,34	0,34
	2	Neuroticism	0,26	0,38	0,06
	3	Openness	0,19	0,41	0,01
commitment	1	Openness	0,39	0,17	0,17
	2	extraversion	0,32	0,27	0,15
Escapism	1	Neuroticism	0,51	0,26	0,24
	2	Extraversion	0,27	0,24	0,06
	3	Conscientiousness	-0,22	0,29	0,04
	4	openness	-0,,18	0,34	0,02

36% of the variance in performance was explained by conscientiousness, neuroticism, and openness, $F(3,183) = 31.22$, $p < 0,05$, adjusted $R^2 = 0,35$. Conscientiousness was the strongest predictor, explaining 32 % of the variance.

25% of the variance in commitment was explained by openness and extraversion, $F(2,184) = 28,3$, $p < 0,05$, adjusted $R^2 = 0,27$. Openness to new experiences was the strongest predictor, explaining 17% of the variance.

32% of the variance in escapism was explained by neuroticism, extraversion, conscientiousness and openness, $F(4,182) = 18,4$, $p < 0,05$, adjusted $R^2 = 0,29$. Neuroticism and extraversion were positively related with escapism whereas conscientiousness and openness were negatively related. Neuroticism was the strongest predictor, explaining 24% of the variance.

DISCUSSION

The results suggest that academic motivation is strongly related to personality. The correlation analyses indicate that personality was significantly associated with a wide range of academic motivations. The factor analysis on the subscales of Academic Motivations Inventory yielded three underlying academic motives–escapism, commitment and performance. The students who preferred to escape tended to feel discouraged about studying, worried about failure, kept to themselves in the classroom. Contrary to this group, students who were committed took pleasure in learning, pursued knowledge for self-improvement, and enjoyed discussions. Finally, performance-oriented students exceled and relished outperforming others. Interestingly, these three subscales turned out to be somewhat similar to the factor structure of another major scale used to assess academic motivation, the Academic Motivation Scale of Vallerand et al. (1992), used by the author on a number of studies (Koseoglu,Y., 2013a, 2013b) . The three underlying

academic motives of the Academic Motivations Inventory – escapism, commitment and performance – seems to correspond to the amotivation, intrinsic, and extrinsic factors of The Academic Motivation Scale.

The relationships between the Big Five personality traits and the three underlying academic factors are further clarified by the regression analyses. First, students with higher levels of openness-to-new-experiences and extraversion were more involved in learning, with openness explaining the most variance. This implies that students who are sociable and enjoy exposure to new ideas are likely to be absorbed by the educational experience and may find discussions and interactive learning beneficial. The fact that extraversion was related with both commitment and escapism suggests that sociability may induce students to be more involved in the learning process and be more concerned with establishing contacts and developing a career

Secondly, escapism was positively related with both neuroticism and extraversion and negatively associated with both conscientiousness and openness. Neuroticism explained the most variance. These results may suggest that neurotic students prefer to avoid many aspects of academic life and regard education as a means to an end. Similarly, extraverts may be more involved with social aspects of university life. Conscientious and open students are less likely to be escapists in their motivations.

Thirdly, students who were more conscientious, neurotic, and open to new experiences scored higher on performance with conscientiousness explaining the most variance. These suggest that students who are responsible and intellectually curious may be more performance-oriented, meticulous and aggressive. An intriguing outcome was that neuroticism was associated with performance. Although future research may be recommended in order to clarify such a relationship, compulsive preparation due to anxiety about failure may be considered as a cause.

The multiple regression results indicate that differences in student motivation levels may be associated with basic personality differences. Needless to say, these levels are often readily apparent in a classroom environment. Students with differing personalities display differing motivational preferences. Hence, instructors may be able to enhance student learning by matching course activities to the motivational preferences held by students with differing personalities. Prior research (e.g., Zhang, 2003) show that personality is related to general aspects of learning. The results of this study about academic motivation indicate that general personality traits are associated with learning styles, preferences and motivation.

One clear implication of the findings concerns the instructors, in that students constitute a heterogeneous body in their levels of academic motivation and in their personalities. Thus, the delivery modes and activities should be calibrated according to the student body. In small classes this may pose no difficulties. However, large classes may present complications. In order to reach all students at least some of the time, instructors who rely on traditional lectures may employ approaches such as discussions, team activities and experiments. Instructors with a suitable tool for each personality trait are more likely to engage a larger number of students.

Our results also suggest that the instructors who want to increase the engagement and achievement levels of their students may do so by targeting the qualities of openness and conscientiousness of their students. The instructor may reward students for thinking beyond the boundaries of the topic and also constructing connections to other fields. In that regard, assignments that focus on broader exposure and integration of ideas may be useful. Displaying conscientious behavior such as being organized and self-regulated may be another reason for rewarding the students. The importance of these qualities for achievement may be highlighted in the curriculum. In addition, the fact that creative thought and high-effort levels are going to be appreciated may be declared early in the term by announcing clear norms and expectations. Training programs for new instructors may entail information about the significance of individual differences and how these should be handled.

This highlights a factor about the structure of the Academic Motivation Inventory. The scale was designed to measure 16 subscales of overall academic motivation. However , the internal consistency of some subscales is relatively low or marginal which may indicate that not all sixteen may be necessary for some researchers. The factor analysis of this study shows that the sixteen subscales may be incorporated into three key factors which were labeled escapism, commitment and performance for the purposes of this study. In addition, each of these key factors has good internal consistency. Furthermore, the analysis between these three key factors and personality traits implies that they may represent distinct aspects of academic motivation. Hence, researchers might consider utilizing this three factor version of the AMI or another suitable structure for future research.

This study comes with certain limitations. First, The study examines the relationship between academic motivation and personality traits. Additional

individual-difference variables such as thinking styles, learning styles or ability measures may be considered instead of personality traits and their relationship to academic motivation can be investigated. Second, other scales for measuring academic motivation could be employed. Although the AMI of Moen and Doyle (1977) offers the benefits of examining many aspects of academic motivation, the AMS of Vallerand et al. (1992) is a scale with good psychometric properties that may reflect a different motivational environment. Thirdly, instead of a single university, additional institutions could be involved , providing a wider variety of populations that differ in features such as language, location and type and size. And finally, as English is the medium of instruction in this university, the use of scales in English has not impeded the process. For a research of a wider scale, properly translated tools would be required.

Until additional research on these issues is conducted, the current findings must be regarded tentative. Nevertheless, the current study takes the important step of documenting that fundamental aspects of personality are strongly related to distinct aspects of academic motivation. It is hoped that this research stimulates additional exploration of the relationships between personality and academic motivation.

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