The effect of personality traits on academic performance: The mediating role of academic motivation

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Abstract

This study examined the effect of personality on academic motivation and academic performance. Participants were college students who voluntarily participated in the study. They were asked to complete a personality questionnaire (NEO-FFI), and an academic motivation questionnaire (AMS-C 28, included GPA and demographic data). Results showed that conscientiousness predicted both of intrinsic and extrinsic motivation, but openness to experience predicted only intrinsic motivation. Moreover, as expected, academic motivation mediated the relationship between openness to experience and conscientiousness with academic performance.

1. Introduction

Academic motivation is one of the effective factors on learners’ achievement. Learners need to be interested in learning; otherwise, all efforts of the educational system would fail. So, understanding and developing the knowledge about factors that affect academic motivation can help to improve educational performance. Although ability and intelligence are considered as predictors of academic achievement, there is evidence that personality variables also play a role (O’connor & Paunonen, 2007). The literature also suggests that personality traits affect the academic motivation and performance (e.g., Costa & McCrae, 1992; Komarraju & Karau, 2005; Chamorro-Premuzic & Furnham, 2003, 2008). Therefore, in the present study we try to investigate the effect of personality on academic motivation and subsequently on educational performance.

There is evidence that personality traits can predict academic motivation and achievement (Costa & McCare, 1992). Grozier (1997) mentions motivation as a core trait in the Big Five factor model of personality knowing that conscientious individuals are organized, hardworking, self-disciplined, ambitious and persevering. In addition, motivation has an important influence on a learner’s learning behavior and achievement (Vallerand et al., 1992). O’Connor and Paunonen (2007) consider three rationales for the evaluation of personality traits as predictors of
post-secondary students’ academic achievement. First, there are behavioral tendencies reflected in personality traits that can affect certain habits that influence academic achievement such as perseverance, conscientiousness, talkativeness. Second, whereas cognitive ability reflects what an individual can do, personality traits reflect what an individual will do. Third, personality as well as cognitive proficiency would predict subsequent performance better in older students, especially motivation-related personality variables.

As mentioned above conscientiousness is introduced as a predictor of academic achievement (Costa & McCare, 1992; Crozier, 1997). There are a number of studies on conscientiousness influences on academic motivation (e.g., Clark & Schroth, 2010) and academic performance (Laidra, Pullmann, & Allik, 2007; Kılıç-Bebek, 2000; Cheng & Ickes, 2009). Wagerman and Funder (2007) count the conscientiousness factor as a valid and unique predictor of college performance. Prior research also confirm the role of openness to experience as one of the main personality factors that predict academic motivation (e.g., Clark & Schroth, 2010) and academic performance (e.g., Laidra et al., 2007; Komarraju, Karau, & Schmeck, 2009). There is ample evidence (e.g., Robinson, 2003; Steinmayr & Spinath, 2009) on the significant correlations between academic motivation and academic performance.

1.2. Personality traits

The Big Five personality traits model as a general taxonomy in a wide range of behavioural and psychological research has been as a point of reference. This model is consisting of five relatively independent dimensions: extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience. In this article we examine openness to experience and conscientiousness. Openness encompasses a wide range of characteristics (McCrae & Costa, 1985). This trait is related to being imaginative, perceptive, curious, artistic, and being interested in a wide range of issues. On the other hand conscientiousness as one of the reliable dimensions of the Big five, deals with self-control, diligence, and being reliable, organized, responsible, planful, and mindful of details.

1.3. Academic motivation

Deci and Ryan (1985) in the Self-Determination Theory (SDT) propose three types of motivation: intrinsic, extrinsic, and a-motivation. “This theory focuses on types, rather than just amount, of motivation, paying particular attention to autonomous motivation, controlled motivation, and a-motivation as predictors of performance, relational, and well-being outcomes” (Deci & Ryan, 2008). When people are intrinsically motivated they experience interest and enjoyment, and feel competent and self-determined. In turn, extrinsically motivated individuals view their behavior as a consequence of external factors. Mori and Gobel (2006) argue that intrinsic value refers to the enjoyment that task engagement brings about whereas extrinsic utility value refers to the usefulness of the task in terms of an individual’s future goals. The third type of motivation, “amotivation”, is described as discernable disconnection between actions and outcomes. Amotivated Individuals do not consider any relationship between effort and attainment of a reward. They attribute achievement to luck or natural abilities and conclude that achievement is not earned through effort (Deci & Ryan, 1985).

1.4. The present study

There is empirical evidence indicating that both personality and academic motivation as two related variables are important predictors of academic performance. The present study is designed to examine a possible mediating role of academic motivation in the relationship between personality and academic performance based on past findings. On the basis of theoretical assumptions and prior empirical results mentioned above, it was hypothesized that conscientiousness and openness to experience are the main traits of personality influencing academic performance. We expected that this effect to be moderated by intrinsic and extrinsic motivation.

2. Method

2.1. Participants and Data collection

The data were collected from 250 college students. Of the all of questionnaires distributed, 232 were returned. After being screened for usability, 217 responses were found to be complete and proper for analysis purposes. There were 98 female and 119 male participants at four grade levels who were ranged from 19 to 35 years of age. \( M = \)
23.03, \( SD = 3.146 \)). Participants were asked to complete the NEO and AMS-C questionnaires in university and took part on a voluntary basis.

2.2. Study measures

2.2.1. Academic motivation

The Self-Determination Theory has been operationalized through the Academic Motivation Scale (AMS-C; Vallerand et al., 1992). Therefore, to evaluate students’ academic motivation, this questionnaire was employed which is considered as one of the most appropriate academic motivation scales available. The AMS-C includes seven subscales which measure three types of intrinsic motivation (intrinsic motivation to know, to accomplish things, and to experience stimulation), three types of extrinsic motivation (external, introjected, and identified regulation), and amotivation. High scores in one of the seven areas indicate the individual's strength of academic motivation and a desire to pursue postsecondary education. This questionnaire contains 28 items that are answered on a 7-point Likert scale.

2.2.2. Personality

Personality traits were assessed with the NEO FFI (Costa & McCrae, 1992). This inventory is a short version of the NEO PI-R and assesses the personality dimensions of neuroticism (low emotional stability), extraversion, openness to experience, agreeableness, and conscientiousness. Items involve questions about typical behaviours or reactions and are answered on a five-point Likert-type scale, ranging from “strongly disagree” to “strongly agree”. Individuals were asked to describe themselves over a range of 60 items with 12 questions for each factor. There is a great deal of empirical literature over the past decade providing evidence of its concurrent, construct, convergent, divergent, incremental, and predictive validity (Chamorro-Premuzic & Furnham, 2003).

2.2.3. Academic performance.

Academic performance was assessed by Grade-point-average (GPA). Students reported their GPA from their last year’s average (two semester’s average).

2.2.4. Data analysis

This study applied the multilevel structural equation modelling (SEM) method to systematically investigate how different factors influence student’s academic performance. To assess the relations between academic self-concept and emotions in specific domains, SEM was used to allow for the disattenuated relationships between the variables under investigation to be evaluated. To correct for potential bias associated with class membership, SEM analyses were also conducted with Amos using the complex sample option.

3. Results

3.1. Correlations

Table 1 presents the mean values, standard deviations, and correlations between openness, conscientiousness, extrinsic motivation, intrinsic motivation, and GPA. As can be observed, all of correlations except relations of intrinsic motivation with extrinsic motivation, and extrinsic motivation with GPA are significant.

|                      | M   | SD  | 1    | 2    | 3    | 4    | 5    |
|----------------------|-----|-----|------|------|------|------|------|
| Openness to experience| 27.3| 6.9 | 1    |      |      |      |      |
| Conscientiousness    | 34.1| 7.5 | .21**| 1    |      |      |      |
| Extrinsic motivation  | 28.3| 6.1 | .17**| .21**| 1    |      |      |
| Intrinsic motivation  | 54.0| 9.2 | .37**| .34**| .05  | 1    |      |
| GPA                  | 17.3| 2.1 | .18**| .08* | .05  | 27** | 1    |
3.2. Structural Equation Modelling

The purpose of the present path analysis was to estimate the relative contributions of openness and conscientiousness in the explanation of the academic motivation variable. To test our model and to show how personality factors may have an indirect effect upon academic performance, we compute several path models. The last model’s indices are presented in this article. Standardized path coefficients and fit indices allow estimation of causal relationships between variables.

The model was specified with paths from conscientiousness and openness to the two facets of the motivation and with paths from extrinsic and intrinsic motivation to GPA. Modification indices also suggested that adding a path between openness and conscientiousness would significantly improve the fit. Six goodness of fit indices were used to evaluate the adequacy of the model fit: the chi squared ($\chi^2$) test, the Comparative Fit Index (CFI), the Goodness-of-Fit Index (GFI), the Relative Fit Index (RFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA).

The structural model showed good fit to the data (Chi-square = 3.709; df = 3; $p = .295$; RMSEA = .033; GFI = .993; TLI = .981; CFI = .994; and RFI = .909). All paths in the structural model, except the path between extrinsic motivation and GPA were significant. Openness to experience was a stronger predictor than conscientiousness to academic motivation. But this variable could only predict intrinsic motivation. The relationship between openness and extrinsic motivation was not significant. The conscientiousness factor was significantly related to both intrinsic and extrinsic motivation, but the strength of relationship was lower than openness to experience.

4. Discussion

Based on theoretical assumptions and empirical studies on personality (especially conscientiousness and openness to experience) and effect on academic motivation and achievement (e.g., Costa & McCrae, 1992; Grozier, 1997; Komarraju et al., 2009; Clark & Schroth, 2010), we hypothesized that the relationship between personality and academic performance mediated by intrinsic and extrinsic motivations. As expected, the results indicated that conscientiousness and openness to experience can predict academic performance (Komarraju & Karau, 2005), suggesting that students who score high in conscientiousness and openness will be more successful at university. The results also confirmed that motivation plays a mediating role in relations between personality traits and academic performance.

It can be concluded that conscientiousness predicts both of intrinsic and extrinsic motivation. Grozier (1997) argues that conscientious students are likely to meet deadlines for assignments, that they will finish tasks rather than leave them incomplete, that they will put a certain amount of effort into a task, that they can apply themselves without continuous supervision, and so on. Openness to experience predicted only intrinsic motivation and subsequently academic achievement suggesting that those who are high on openness tend to be intellectually curious, intelligent, insightful, aesthetic, and interested. These qualities can demonstrate why students who are high in openness perform better. For example being interested and insightful, they desire to gain deep understanding of many things. This interest can orient to new strategies of learning and new academic issues result in academic achievement. Having previous research in mind, prior researches indicate that there is a relationship between openness to experience and intelligence. For instance Chamorro-Premuzic and Furnham (2008) proposing the “investment” role of openness to experience as a determinant of higher IQ, argue that IQ is separately affected by fluid intelligence and openness to experience and affected deep learning, which in turn led to higher grades.

To conclude, educators can seek the low/high-achievement causal factors in motivational and personality traits. The importance of these personal differences and trying to recognize them should also be considered. In addition to personality and motivation, other variables (e.g., IQ, learning approaches and environmental variables) can influence academic performance that can be examined in future studies. However, this study by exploring the mediating role of academic motivation in relations to personality and performance added another point of view to these relations. The nature of these relations, however, can be a point of departure for further research in this area.
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