


The Correlation of Academic Conscience and Students' Academic Performance with the Mediating Role of Academic Hardiness

Fardin Seifi¹, PhD Candidate;  Masoud Hejazi^{1*}, PhD;  Afsaneh Sobhi¹, PhD; Qamar Kiani¹, PhD

¹Department of Psychology, Islamic Azad University, Zanjan Branch, Zanjan, Iran

*Corresponding author: Masoud Hejazi, PhD; Department of Psychology, Zanjan Branch, Islamic Azad University, Zanjan, Iran. Tel: +98 9126422932; Email: masoud.hejaziaz@gmail.com

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Abstract

Background: Academic performance, as a behavioral consequence, is of great importance for students and is considered as significant indicator for evaluating educational systems and identifying the factors affecting them. This led us to study the relationship of academic consciences and academic performance with the mediating role of academic hardiness in ninth grade students in Zanjan.

Methods: As the statistical population, we selected all the ninth-grade male students of district 1 of education department of Zanjan, Iran in 2018-2019. The present research was conducted as a descriptive correlational study. The statistical sample comprised 295 of these students. Data were collected using McIlroy and Banting Academic Conscience Questionnaire and Academic Hardiness Questionnaire of Benishkak and colleagues. Additionally, total academic grade point average (GPA) of the students was utilized to assess academic performance. The data were analyzed by Pearson correlation and stepwise regression tests. To determine the mediating role of academic hardiness, Baron and Kenny method was also used.

Results: The correlation of the variable of academic conscience with the academic performance equaled $r=0.255$, $P=0.042$, effort control equaled $r=0.131$, $P=0.047$, emotion control equaled $r=0.181$, $P=0.045$, challenge ability was $r=0.161$, $P=0.045$, and hardiness was $r=0.195$, $P=0.044$; these results were statistically significant. This study also revealed that in the relationship between academic conscience and academic performance, academic hardiness has a mediating role.

Conclusion: Academic conscience, by affecting academic hardiness, can contribute to students' academic performance.

Keywords: Academic performance, Academic tenacity, Consciousness

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1. Introduction

A review of the course of emotional problems over a lifetime shows that not all stages of life are equally vulnerable to challenges. Examination of reference sources has reported the prevalence and incidence of the majority of mental disorders in adolescence (1). One of the major aspects of adolescents' lives, which can be considered as a source of stress for them, is educational activities. These tensions are to the extent that they have led to the formation of new contents, such as "academic stress and test anxiety", in the field of research literature.

Even though several components can be studied as an educational variable, academic performance is recognized as a criterion for reaching a higher educational level and entering the business environment (2). Therefore, it has received further attention than other components. Nowadays, students' academic performance has been considered as an important indicator for evaluating educational systems. In addition, good academic performance has always been

important for teachers, students, parents, theorists, and educational researchers (3).

Students gain the approval and acceptance of parents, teachers, and peers through their academic performance, which increases their self-confidence and self-efficacy. Meanwhile, failure in this regard can make the student hesitate about his abilities and adequacy, making him feel inefficient and inferior. All these situations will have an undeniable effect on determining the fate and future of the student (4). Therefore, it can be argued that the academic performance of students is important not only for themselves and teachers, but also for families, the education system, and the society (5). Since students account for the main part of any educational system, particular attention must be paid to this group and the way through which they can achieve their goals (3).

This will contribute to further prosperity of the educational system in a society (6). In addition, the need for change in education is to know more factors affecting the academic performance of students, to

benefit more from the resources allocated to this field, and this in the formulation and implementation of a better and more efficient educational program and thus improve the quality of education. Students also achieve better results owing to their better understanding of the factors affecting their academic performance (7).

Investigating and identifying relevant and effective factors in students' academic performance is believed to be essential for improving the quality of the educational systems (8), which can also be known as a buffer against psychic damage. As a result, it is necessary to address the factors that affect students' academic performance. In the majority of papers, the total academic grade point average has been used as the main indicator in measuring academic performance, which despite some limitations, is directly related to students' educational activities. Thus, in the present study, we used the students' mean of scores as a measure of academic performance.

A review of the theoretical and research literature suggested that academic performance is influenced by several factors that can be divided into two general dimensions, namely intrapersonal and extra personal dimensions. One of the basic intrapersonal factors, which often affects all aspects of life, is personality or some fundamental personality factors that can affect individuals' academic performance (9).

Conscience, as one of the main traits of personality, is a subset of Conscientiousness, which is itself one of the five major factors of personality traits (10, 11). Duckworth and colleagues found in a study that students with strong conscience may be more likely to succeed because of their strong desire to learn or their dominant goals, which contributes to their competence and performance in school. Behaviorists associate conscience with reinforced values and norms. Nevertheless, trait theorists see the source of these behaviors to be a hidden and public essential source (2). Costa and McCrae considered the factor of conscience to include six facets or sub-traits: competence, regulate, dutifulness, achievement striving, self-control, and deliberation. Conscientious people are productive, ethical, highly motivated, independent, and responsible (12).

In some of the studies mentioned, conscience is actually a more powerful predictor of job, education, and academic performance (13). Previous findings have also indicated that the characteristic of conscience is associated with hard work, higher GPA, and more positive and committed social relationships (14); in

addition, it can reduce academic burnout (15). However, most findings have shown that the relationship between academic conscience and students' academic performance can be influenced by certain mediating variables (16, 17). One of these variables is academic hardiness. Academic hardiness, as a set of personality traits, is one of the variables related to students' academic performance (18). It is a source of resistance in confronting with stressful life events, including education. Kobasa and colleagues defined hardiness as a combination of beliefs about oneself and the world, consisting of three components: commitment, control, and challenge (19).

Psychological hardiness is a protective factor that affects how students face academic challenges, unpreparedness, and other destructive experiences (20). Studies in the field of psychological hardiness have indicated its important role in education; the research by Elhampour and colleagues (21) and Samavi and co-workers (20) revealed that high hardiness results in greater academic success. Subramanian and Vinothkuma concluded that psychological hardiness contributes to a greater sense of self-esteem in individuals and ultimately, results in their resistance against stress of work and study and increases their Vitality (22).

In general, we could suggest that the vulnerability of adolescents, stressful educational activities, along with academic performance of students necessitate identification of the factors that facilitate academic performance. On the other students in some grades may experience further stress than others; for example, ninth graders (choosing major) and twelfth graders (end of general education to enter university) may experience more stressful periods. Therefore, we decided to conduct the present research on ninth grade students. Research has also indicated a relationship between academic conscience and academic performance. On the other hand, there are some contradictory findings regarding research variables that may be influenced by hardiness mediation, because they have also indicated a relationship between hardiness and academic performance (23). Hence, this study aimed to predict the academic performance of ninth-grade students based on academic conscience by considering hardiness as a mediator.

2. Methods

This was a descriptive-correlation study. Our research population included all the ninth-grade male

students in district 2 of the education department of Zanjan, Iran in 2018-2019. The number of students in this grade was 1800. The sample size was calculated using the G-Power software V3 in order to detect the optimum sample size. Accordingly, the maximum sample size was determined for the variable of academic performance based on the study of Brazdău and Mihai (24). We considered a confidence level of 95%, a margin of error of 5%, a statistical power of 80%, and an effect size of $r=0.209$; therefore, the minimum sample size was calculated to be 174. However, we finally included 295 participants into the study. Primarily, five schools were selected: 22 Bahman 1, Bratharan Parvizi, Haj Ahmad Khomeini, Razzaq Afsharchi, and Shahid Arfai 2. Afterwards, in each school, two classes were selected through simple random sampling. Questionnaires were distributed among all the students in the selected classes. The students were given 20 minutes to complete the questionnaires. At the beginning of the class, they were given the necessary explanations about the dissertation and its objectives, and in case of any ambiguity or questions, they were answered.

2.1. Instruments

In line with the majority of papers, in the present study, the student's GPA was used to evaluate the academic performance.

2.2. Academic Conscience Scale

Academic conscience was assessed through a questionnaire developed by McIlroy and Bunting (25). This questionnaire comprises nine items and is formulated with a seven-point Likert scale. The students' level of agreement with the questionnaire options was obtained through a seven-point Likert scale. The instructions used to help students complete the questionnaire were designed in a way that they could answer the questions simply without guiding them to think about a particular course. Some items were scored in reverse. Subsequently, the total score of each student was calculated. For this purpose, the values of all the responses were added. The maximum possible score in this case was 63 (25). In the study by Hood and colleagues (26), in which Cronbach's alpha analysis was used at the beginning and end of the semester, this scale showed good internal reliability. In this case, for the beginning and end of the semester, the values $\alpha=0.77$ and $\alpha=0.86$ will be obtained, respectively. There were no significant differences concerning the levels of academic conscience in any of the five classes. In the study by Fatin and colleagues

(27), by calculating Cronbach's alpha coefficient, the total reliability of the questionnaire was over 0.7. Confirmatory factor analysis was utilized to calculate the validity of the questionnaire, and it was concluded that all the items of this questionnaire have a sufficient factor load of above 0.30 (between 0.72 and 0.80). Its fit index was $RMSEA\ 0.061=GFI\ 0.93$, which confirms the relative fit of the model of this scale with the data. Fazli and Fooladchang (15) employed confirmatory factor analysis method to confirm the validity of scale, which confirmed the results of a significant factor that explained 37% of the variance of academic conscience. In the above-mentioned study conducted in Iran, it was reported that the total average content validity ratio (CVR) and content validity index (CVI) were 0.79 and 0.86, respectively. In order to evaluate the reliability of the scale, Cronbach's alpha was used and the coefficient was obtained to be 0.75.

2.3. Academic Hardiness Scale

Benishek and co-workers (28) developed a questionnaire that included 40 questions and three subscales (commitment/control of effort, control of affect, and challenge). This scale consists of 19 questions for measuring commitment/control of effort, 11 for measuring control of affect, and 10 for measuring challenge. Respondents report their opinion on the correctness or incorrectness of any of the item on a four-point Likert scale. For re-validating the academic hardiness scale, Benishek and colleagues (28) performed it on a sample of students who were studying or taking courses to prepare for university, in the age range of 16 to 19 years. The reliability of the hardiness scale was reported to be acceptable with the internal consistency method. Using Cronbach's alpha, the reliability of this scale was obtained for the dimensions of commitment/control of effort, control of affect, and challenge. As a result of this process, the overall scale was 0.91, 0.81 and 0.88, respectively. To assess the validity, the hardiness scale was correlated with the neurotic dimension of the Neuroticism-Extraversion-Openness questionnaire and the academic self-concept scale. Pearson correlation coefficients of academic hardiness with neuroses and academic self-concept were 0.41 and 0.68, respectively, both of which are significant. In Iran, Farrokhi and colleagues (29), after translating the questionnaire, performed it on students and confirmed its validity and reliability. In this study, $CVI = 0.78$ and $CVR = 0.85$ were obtained. Moreover, via factor analysis, three components were identified as the main components of the questionnaire. These factors were confirmed using confirmatory factor analysis. The determined factors

had a reliability coefficient of 0.47 to 0.87 and the overall alpha coefficient of the questionnaire was 0.81

Finally, the path analysis method and the maximum likelihood method were utilized to analyze the data. Version 25 Amos / SPSS was used for this purpose.

In order to evaluate the model quality, we employed Chi-square indices (χ^2), root mean square error index (RMSEA), goodness-fit index (GFI), incremental fitness index (IFI), and adaptive fitness index (CFI). For good fit of the model with the data, the GFI, IFI, and CFI indices must be equal to or greater than 0.95. If χ^2/df index is smaller than 3, it is acceptable. The closer this index is to 1, the more ideal the model will be. If the RMSEA is less than 0.08, it means that the model is acceptable, and the closer it is to 0, the better the fit of the model. In this study, the ethical issues related to the participants were observed. These issues were as follows:

1) At the beginning of the questionnaire, written consent was obtained from the subjects.

2) Prior to starting the study, the participants were given the necessary information about the subject and how to conduct the study. The researcher undertook the confidentiality of the subjects' private information.

3) The obtained results were interpreted for the subjects.

4) The subjects were provided with the necessary instructions to complete the questionnaire.

5) Participation in this study did not entail any financial burden for the participants.

6) This study did not contradict the religious and cultural norms of the subjects and society.

3. Results

A total of 295 male students (14.36 ± 0.92 years) of ninth grade from the schools in Zanjan, Iran participated in this study. The majority of them were from three- and four-member families and nearly 70% of the samples were 14 to 15 years old (Table 1).

Table 1: Demographic characteristics of the study participants

Variable		Number (%)
Father's education	Under high school diploma	54(18.03)
	High school diploma	98(32.02)
	Associate	25(8.05)
	Bachelor	66(22.04)
	Master	39(13.02)
	PhD	5(1.07)
	No answer	8(2.07)
Mother's education	Under high school diploma	86(29.02)
	High school diploma	75(25.04)
	Associate	21(7.01)
	Bachelor	78(26.04)
	Masters	24(8.01)
	PhD	2(0.67)
	No answer	9(3.02)
Father's job	Self-employed	125(42.04)
	Administrative employee	94(31.09)
	Teacher	40(13.06)
	Doctor	5(1.07)
	Engineer	15(5.01)
	Retired	9(3.01)
	No answer	7(2.04)
Mother's job	Self-employed	10(3.04)
	Administrative employee	50(19.06)
	Teacher	69(23.04)
	Doctor	2(0.07)
	Retired	20(6.08)
	Housewife	140(47.05)
	No answer	3(1.01)

The mean±SD scores of the subjects (295 students) for academic performance, academic conscience, and academic hardiness were 16.832±2.056, 37.714±1.181, and 88.956±9.720, respectively. The skewness and kurtosis values of the items and variables were between -2 and 2, indicating that the data distribution was close to normal (Table 2).

The correlation coefficient of the variable of academic conscience with the predictive variables was as follows: academic performance $r=0.255$, $P=0.042$, effort control $r=0.131$, $P=0.047$, emotion control $r=0.181$, $P=0.045$, challenge ability $r=0.161$, $P=0.045$, hardiness $r=0.195$, $P=0.044$; they were all statistically significant (Table 3).

Path analysis was used to analyze the causal model of problem-solving behaviors of the participants. In addition, the assumptions related to causal modeling were reviewed and confirmed. This was done before the main analysis. Figure 1 represents the conceptual model of the study.

The estimation results in Table 4 indicate the relative appropriateness of the indicators. According to the output of Amos, the calculated value of X^2 was equal to 2.867, which is less than 3 in relation to its degree of freedom (1). This means that there were no significant differences between the conceptual model and the observed research data. The RMSEA value was equal to 0.057. Indexes GFI, NFI, IFI, RFI, AGFI, TLI, and CFI

Table 2: Descriptive findings regarding the research variables

Title of variables	mean±SD	Min	Max	Skewness	Kurtosis
Academic performance	16.832±2.056	12.00	20.00	-0.456	-0.531
Academic conscience	37.714±1.181	17.00	57.00	-0.375	-0.115
Effort control	43.335±5.657	19.00	58.00	-0.793	1.897
Emotion control	24.729±3.244	16.00	35.00	-0.108	-0.017
Challenging	12.871±3.541	10.00	29.00	-0.061	0.231
Academic hardiness	88.956±9.720	57.99	115.61	-0.149	0.076

Table 3: Correlation matrix among the research variables

Variable		Academic performance	Academic conscience	Effort control	Emotion control	Challenge ability	Hardiness
Academic performance	Pearson Correlation	1					
	P value	-					
Academic conscience	Pearson Correlation	0.255	1				
	P value	0.042	-				
Effort control	Pearson Correlation	0.416	0.131	1			
	P value	0.012	0.047	-			
Emotion control	Pearson Correlation	0.276	0.181	0.252	1		
	P value	0.04	0.045	0.042	-		
Challenge ability	Pearson Correlation	0.286	0.161	0.377	0.656	1	
	P value	0.04	0.045	0.013	0.001	-	
Hardiness	Pearson Correlation	0.439	0.195	0.803	0.719	0.803	1
	P value	0.011	0.044	0.001	0.001	0.001	-

Table 4: Goodness of fit index for the main model of research

Fit indexes	Model	Limit
χ^2/df	2.867	>3.00
GFI (goodness of fit index)	1.000	<0.90
RMSE (Root Mean Squared error)	0.057	>0.08
IFI (Incremental Fit Index)	1.000	<0.90
NFI (Normed Fit Index)	1.000	<0.90
RFI (Relative Fit Index)	0.989	<0.90
AGFI (Adjusted Goodness of Fit Index)	0.985	<0.90
TLI (Tucker-Lewis Index)	0.995	<0.90
CFI (Comparative Fit Index)	1.000	<0.90

Table 5: Path coefficients and t-values for some of indexes of the main model

	Path coefficients in estimation mode	Path coefficients in non-standard estimation mode	SD	t-value	P value	Status
Academic conscience → Academic hardiness	0.145	0.172	0.063	2.732	0.006**	Confirmed
Educational enthusiasm → Academic hardiness	0.391	0.405	0.055	7.389	0.001**	Confirmed
Academic conscience → Academic achievement	0.138	0.035	0.013	2.639	0.008**	Confirmed
Educational enthusiasm → Academic achievement	0.131	0.029	0.012	2.322	0.020*	Confirmed
Academic hardiness → Academic achievement	0.358	0.076	0.012	6.287	0.001**	Confirmed

**P<0.01, *P<0.05

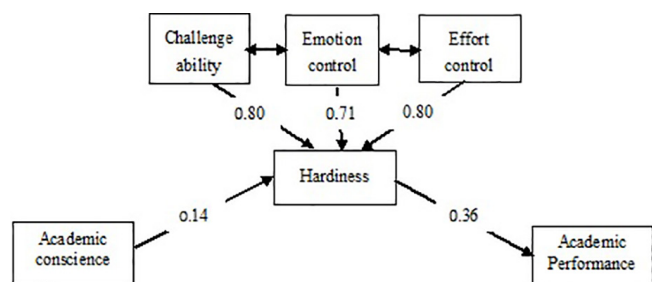


Figure 1: The figure shows the proposed model to explain academic performance with path coefficients.

were equal to 1.000, 1.000, 1.000, 0.989, 0.985, 0.995, and 1.000, respectively, which indicated a high fit.

Model coefficients in standard estimation mode showed the effect of each variable on explaining the variance of the scores of the main structure. In other words, path coefficients indicated the degree of the correlation between each observer variable (questionnaire questions) and the non-observer or latent variable (factors). The significance of path coefficients was determined based on the t-value test. According to Table 5, since the level of significance was checked at the error rate of 0.05, and considering the fact that the t-value test statistics were greater than the critical values of 1.96 and -1.96, all the path coefficients are significant.

4. Discussion

The results of this study revealed a positive relationship between academic conscience and academic performance. This relationship is such that an increase in the score of students' academic conscience augments their academic performance. This result is in line with the findings of Osher and Kneidinger (30), Komar and colleagues (31), McIlroy and Bunting (25), Shiner and Masten (32), Wolfe and Johnson (33), and Fazli and Fooladchang (15).

Osher and Kneidinger (30) reported that students with a high conscience are more likely to be successful owing to their high desire to learn or their dominant goals,

which contributes to their competence and success in school. Eilam and colleagues (34) demonstrated a positive correlation between academic conscience and academic performance. Other studies have reported positive and direct relationships between academic conscience and academic performance and success. Peng showed that intrinsic values and cognitive strategies are closely related to students' performance in exams and self-efficacy has a much stronger effect on learners' academic performance (35). The results of a study conducted by Poropat, using meta-analysis, implied that academic performance has a significant and positive relationship with adaptability, being dutiful, and conscientiousness (36). In this regard, other papers have concluded that conscientiousness and inclusive commitment have a significant relationship with academic performance (28). In internal studies, Fazli and Fooladchang (15) reported that academic conscience has a positive effect on academic performance goals and a negative effect on academic burnout. Academic conscience, as a positive trait, enables students to act responsibly towards school assignments and creates a positive convergence between academic components. Students with high academic conscience are goal-oriented and do their homework seriously. This trait generates academic motivation in them and this high motivation results in academic success for them (15); thus, the alignment of this trait with academic performance was to an extent predictable and expected. Thus, this positive correlation highlights the need to strengthen the academic conscience as far as possible. In the present study, academic hardiness had a direct and positive relationship with academic performance. This variable also played a mediating role. Furthermore, Narimani and colleagues (37), in line with Elhampour and colleagues (21) and Safarkhanlou and colleagues (13), showed that psychological hardiness has a significant relationship with students' academic performance. He also stated that psychological hardiness can predict students' academic performance. It could be said that hardiness personality trait creates a certain inner attitude that affects the way people deal with various problems in life and makes a person pay

attention to psychological pressures more realistically and high-mindedly. In other words, the attribute of struggle enables a stubborn person to consider even unpleasant events as a possibility for learning and not a threat to safety. All these aspects prevent or shorten the negative consequences of stressful events. As a result, it provides the background for mobility, interest, and enthusiasm in learning.

The present work had certain limitations. Given the fact that we conducted this research only on ninth-grade students in Zanjan, Iran, the generalization of the results to other grades should be done carefully and cautiously. At the same time, the epidemic of COVID-19 and the physical absence of students in schools limited the distribution of the questionnaires. This limitation was largely eliminated by electronicizing a number of questionnaires. Furthermore, according to our results, reinforcement of some components could be suggested, which are conducive to the improvement of students' academic performance. In this regard, teaching academic hardiness methods and using methods that result in further motivation and enthusiasm of students can be beneficial. Moreover, strengthening students' academic conscience will ultimately contribute to students' academic growth and development.

5. Conclusion

In the present study, academic conscience was found to be one of the factors affecting students' academic performance, which, by influencing academic hardiness, can be conducive to students' academic performance. The effect of academic conscience on students' academic performance was positive and direct. The students with high academic conscience were of good academic performance.

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Ethical Approval

The Ethics Review Board of the university approved the present study with the code of IR.IAU.Z.REC.1399.069. Also, the written informed consent was obtained from the participants.

Conflict of Interest: None declared.

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