

Original Article

Relationship between tolerance of ambiguity and family cohesion with academic engagement based on mediating role of academic resilience in female students

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Abstract

Background: The orientation of academic resilience is towards positive processes of life and psychological empowerment of students, so, academic resilience is a significant factor affects the tolerance of ambiguity and family cohesion in students, resulting in increased academic engagement. This study designed to assess the relationship between tolerance of ambiguity and family cohesion with academic engagement based on mediating role of academic resilience in female students in Ahvaz city.

Method: This was a descriptive correlation study accomplished by path analysis. The study population comprised second-grade high-school female students in Ahvaz city in 2020. Using simple random sampling 216 of which were selected as the participants. The data gathering instruments were: the Schoolwork Engagement Inventory, the Tolerance for Ambiguity Scale, the Family Cohesion Scale, and the Academic Resilience Inventory.

Results: Results revealed a good fit for the modified model (CFI=1.00, IFI=1.00, RMSEA=0.001). The results indicated that there was a significant direct relationship between family cohesion and academic engagement ($\beta=0.365$, $P=0.001$), and between tolerance of ambiguity and academic resilience ($\beta=0.274$, $P=0.001$). Moreover, there was a positive relationship between family cohesion and academic resilience ($\beta=0.369$, $P=0.001$), and between academic resilience and academic engagement ($\beta=0.328$, $P=0.001$). The results of indirect path analysis indicated that academic resilience had a mediating role in the relationship between tolerance of ambiguity and family cohesion with academic engagement.

Conclusion: The modified model had a good fitness, and is an important stage in recognizing the factors affecting the engagement and academic achievement of students.

Keywords: Achievement; Family; Resilience; Students; Tolerance.

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Introduction

In all countries, the educational system is created to enhance the cognitive, emotional, and affective characteristics of learners (1). Many factors affect the overall growth and development of students. Nevertheless, academic engagement in educational activities is a

key factor for the enhancement of their academic performance (2). Engagement means active participation of an individual in a task or activity and presents a framework for understanding educational concerns, such as quitting school (3). Engagement refers to the quality of efforts

made by students in educationally purposeful activities and directly contributes to desired academic outcomes (4). It should be noted that students are not directly engaged in learning rather they are involved with tasks, activities, and experiences that lead to learning.

Therefore, the key task of an education system is to encourage students to invest their internal resources (energy, time, and attention) in their educational tasks and activities (5). When students perceive their educational tasks as meaningful and valuable, their attention is attracted and thus use their energy to do them and feel committed to them. This feeling of commitment encourages students to finish their homework and spend more time on it. Therefore, attention and commitment are two important dimensions with a mutual impact on academic engagement (6).

Due to the specific importance of academic engagement, finding its effective factors can contribute to higher academic achievement. Tolerance of ambiguity is one of these factors. A significant role of the tolerance of ambiguity, along with other relevant educational variables can inform instructors about the importance of the learners' characteristics. Exposure to a bunch of unfamiliar, complex, and unclear methods makes people confused. In this situation, it is the personality of the individual that determines the extent to which he/she can successfully cope with this uncertain situation (7). There is a correlation between the tolerance of ambiguity and academic engagement, and instructors should consider this personality structure in educational situations (8). Tolerance of ambiguity is a personality variable, which is presented in specific forms in modern psychology literature. It refers to a process, in which the person processes information in an uncertain situation and responds to this information with a set of cognitive, emotional, and

behavioral reactions (9). Tolerance of ambiguity refers to the acceptance of uncertainty, as a part of life, ability to survive with incomplete knowledge, and tendency towards starting a direct activity without a clear result (10). In similar studies, Shaterian-Mohammadi et al. (9), Radmehr and Karami (11), and Saeedi Mobarakeh and Ahmadpour (12) showed that the tolerance of ambiguity promoted academic engagement of students.

In this regard, the important role of family cohesion in academic engagement and achievement cannot be ignored. Family is among the pillars of every society that normality and abnormality of society depend on general conditions of families. Every social harm is somehow related to family conditions. As a result, a healthy society without healthy families is not possible (13, 14). Family is a system that influences people and its insiders and shapes their behaviors. Many psychological and behavioral abnormalities of individuals have a root in their families (15). Many advances made by humans also originated from the family. Family cohesion is among the pillars of family and the foundation for understanding family processes (16, 17).

Academic resilience is an important factor that affects the tolerance of ambiguity and family cohesion in students, resulting in increased academic engagement. The orientation of academic resilience is towards positive processes of life and psychological empowerment of students (18). In this regard, academic resilience refers to students' ability to overcome problems, barriers, and challenges of daily academic activities of the majority of students, such as low grades, pressure from the exam, difficult homework, and negative feedback in the teacher-student relationship, competition, and losing motivation (19). Resilience is related to the daily struggles or stresses of students and is different from a reaction to situational

stresses that indicate an unsuccessful situation. In fact, resilience is focused on the person's response to daily challenges (20, 21). Martin and Marsh (22) showed that resilience is a strong predictor of absenteeism and self-esteem. Shakarami et al. (23) and Celik et al. (24) showed a relationship between academic resilience, engagement, and achievement.

In conclusion, academic engagement in educational contexts refers to behaviors aimed at the improvements of learners. Students encouraged to learn a specific topic become prepared to do activities that contribute to their learning. In contrast, the learning effort of demotivated students are not systematic, they may be inattentive in the class, disorganized, and reluctant to review previous lessons (25, 26). Given the important role of students in the development of society, along with various problems facing them in an educational environment, it is needed to make required plans to deal with those problems. Evaluation and explanation of the relationship between tolerance of ambiguity and family cohesion with academic engagement through the mediating role of academic resilience in female students in Ahvaz are among the most important innovations of this study. The main hypotheses of the present study are as follows: There is a direct relationship between tolerance of ambiguity and academic engagement. There is also a relationship between family cohesion and academic engagement. Furthermore, academic resilience act as a mediator in the relationship between tolerance of ambiguity and family cohesion with academic engagement in the students. Accordingly, the main objective of the current research was to assess the relationship between tolerance of ambiguity and family cohesion with academic engagement based on mediating role of academic resilience in female students in Ahvaz city in 2020.

Method

Study design

This descriptive-correlational study investigated the relationship between variables using path analysis.

Participants

The study population included all second-grade high-school female students in Ahvaz in the academic year of 2020-2021. To select a sample, one of the education districts of Ahvaz was nominated by simple random sampling. In the next stage, we randomly selected one of the girls' high schools in this district. Since classes were held virtually because of the COVID-19 pandemic, the participants were selected through a simple random sampling technique by sending the link of questions to the students. A total of 250 questionnaires were provided to students. In this study, completing the questionnaires for students took 60 to 90 minutes. Finally, 216 students were selected after removing the distorted questionnaires.

Inclusion and exclusion criteria

The inclusion criteria were: agreed to participate in the study, age of 15-17 years, and having any mental disorders based on participants' statements. The exclusion criteria included not answering all the questions in the questionnaire.

Ethical considerations

Willingness to be as a participate in this research, confidentiality of data, and considering contributors' rights were the ethical issues of the study. The Ethics Review Board of Islamic Azad University Ahvaz Branch, approved the present study with the following number: IR.IAU.AHVAZ.REC.1399.125.

Research Instruments

The Schoolwork Engagement Inventory: The Schoolwork Engagement Inventory was developed by Salmela-Aro and

Upadaya (27). This 9-item inventory, which was developed based on the Utrecht Work Engagement Scale (Schaufeli et al., 2002), measures three subscales of the feeling of energy (three items), feeling of commitment (three items), and feeling of accomplishment (three items). The contributors answered to each item based on a Likert scale anchored by 0 "never" to 6 "every day." Salmela-Aro and Upadaya (27) performed a psychometric analysis on the schoolwork engagement inventory among a group of participants in the age range of primary and secondary adolescence and experimentally confirmed the confirmatory factor analysis results of schoolwork engagement inventory in the age group of secondary adolescence. Moreover, the common dispersion between this inventory and variables of depression, academic burnout, self-esteem, and academic achievement experimentally confirms the validity of academic engagement. The validity of the questionnaire in Persian was assessed by Abdollahpour (28). He reported a Cronbach's alpha of 0.87, 0.82, and 0.91 for the feeling of energy, feeling of commitment, and feeling of accomplishment, respectively. In the present study, Cronbach's alpha coefficient reported as 0.84.

The Tolerance for Ambiguity Scale: This 13-item scale was developed by McLain (29) to measure ambiguity tolerance based on a 7-point Likert scale anchored by 1 "completely disagree" to 7 "completely agree." Items 1, 2, 3, 4, 5, 6, 9, 11, and 12 are scored inversely from 5 "completely disagree" to 1 "completely agree." Scores between 15-30, 30-45, and > 45 indicate low, moderate, and high levels of ambiguity tolerance, respectively. McLain (29), reported an alpha Cronbach coefficient of 0.82. Radmehr and Karami (11) reported a Cronbach's alpha of 0.69 for the scale. In our study, Cronbach's alpha coefficient was 0.81 for the scale.

Family Cohesion Scale: Family Cohesion Scale (FCS) was developed by Razavieh and Samani in 2000 based on the literature on correlation and Olson's compound model in 1999. This scale has 28 items scored based on a Likert scale anchored by completely 1 "disagree," 2 "disagree," 3 "null," 4 "agree," 5 "completely agree". Items 1, 2, 7, 13, 14, 15, 16, 23, 25, and 26 are scored inversely. The maximum and minimum scores in this test were 140 and 28, respectively. Amani and BabaeyGharmkhani (30) reported a Cronbach's alpha of 0.79 for the scale. In our study, Cronbach's alpha coefficient reported 0.81.

Academic Resilience Inventory: The Academic Resilience Inventory (ARI) was made by Samuels in 2004. The final version of this questionnaire has 40 items measuring three components of communicational skills, future- and problem-focused orientation, and positivism. The respondents were asked to score their academic resilience based on a 5-point Liker scale anchored by 1 "completely disagree" to "completely agree." The items of the ARI were reduced from 40 to 29 after normalization by Soltaninejad et al. (31). The total score of the questionnaire is obtained from the total score of the questions. Soltaninejad et al. (31) reported a Cronbach's alpha of 0.77, 0.76, and 0.80 for the communicational skills, future- and problem-focused orientation, and positivism, respectively. In our study, Cronbach's alpha coefficient reported as 0.80, 0.77, and 0.73 for the for the communicational skills, future- and problem-focused orientation, and positivism, respectively.

Data Analyses

Descriptive and inferential statistics like mean, standard deviation, and Pearson correlation coefficient were used to present the results. To assess the proposed model, we used the path analysis. SPSS software

and AMOS version 25.0 were further used for analyzing the data.

Results

The participants included 216 female second-grade high-school students, aged 16.99 ± 3.36 years old. The descriptive statistics are presented in Table 1. The result of the skewness and kurtosis test for the normal distribution of scores shows that the values of skewness and kurtosis of the study variables were in the range (-2 to 2). Therefore, the distribution of all research variables is normal. The Pearson correlation coefficient results showed a significant positive relationship between all research variables at $P < 0.01$. An initial model was proposed to describe academic engagement based on the tolerance of ambiguity, family cohesion, and academic tolerance (Figure 1).

Deriving from $RMSEA = 0.485$ (Table 2), the initial model needed to be modified. In the initial model, since it was saturated, all probable paths were drawn. In this model, it was not possible to calculate chi 2 and other indices. After removing one of these paths (ambiguity tolerance to academic engagement), the model was desaturated and enabled software to calculate chi 2 and other indices. In the final model, $RMSEA = 0.001$, which indicated a good model fit (Figure 2).

According to Table 3 we found a significant direct relationship between family cohesion and academic engagement ($P = 0.001$), and between tolerance of ambiguity and academic resilience in the female second-grade high-school students ($P = 0.001$).

Table 1. Mean, standard deviation (SD), skewness, kurtosis, and Pearson correlation coefficients of the study variables

Variables	M	SD	Skewness	Kurtosis	1	2	3	4
1- Academic engagement	33.35	17.27	-0.26	-0.62	1			
2- Tolerance of ambiguity	42.47	21.20	-0.61	0.32	0.410**	1		
3- Family cohesion	89.53	32.89	0.42	-0.86	0.544**	0.318**	1	
4- Academic resilience	121.51	44.04	0.27	-0.39	0.527**	0.427**	0.486**	1

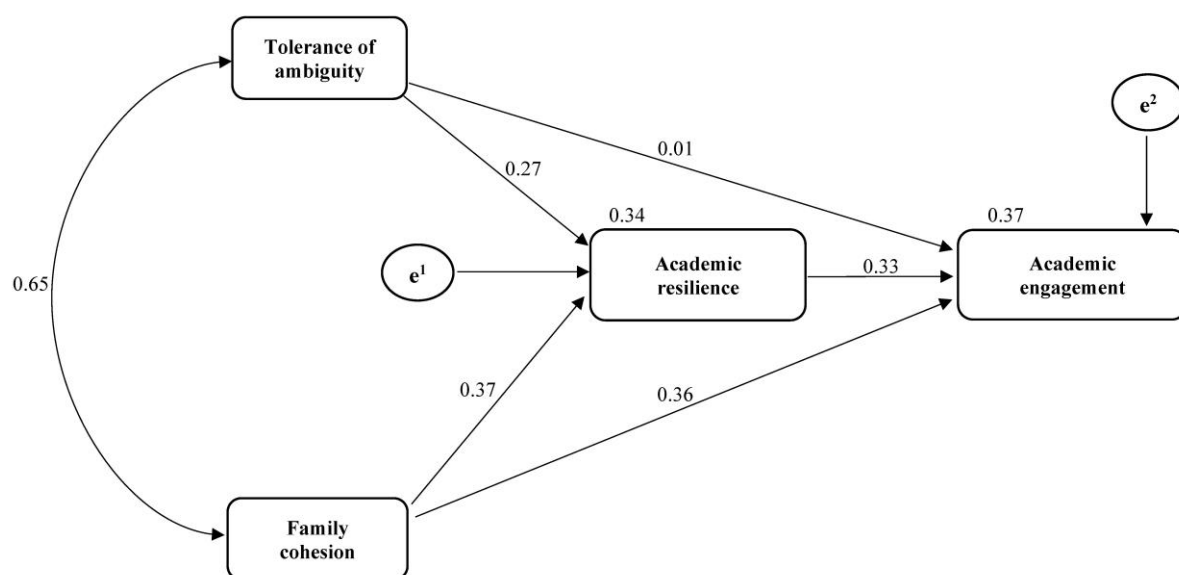


Figure 1. The initial model of the mediating role of academic resilience in the association of tolerance of ambiguity and family cohesion with academic engagement

Table 2. Initial and final model fit indicators

Fit indicators	χ^2	df	(χ^2 /df)	IFI	TLI	CFI	NFI	RMSEA
Initial model	-	-	-	-	-	1.00	1.00	0.485
Final model	0.006	1	0.006	1.00	1.00	1.00	1.00	0.001

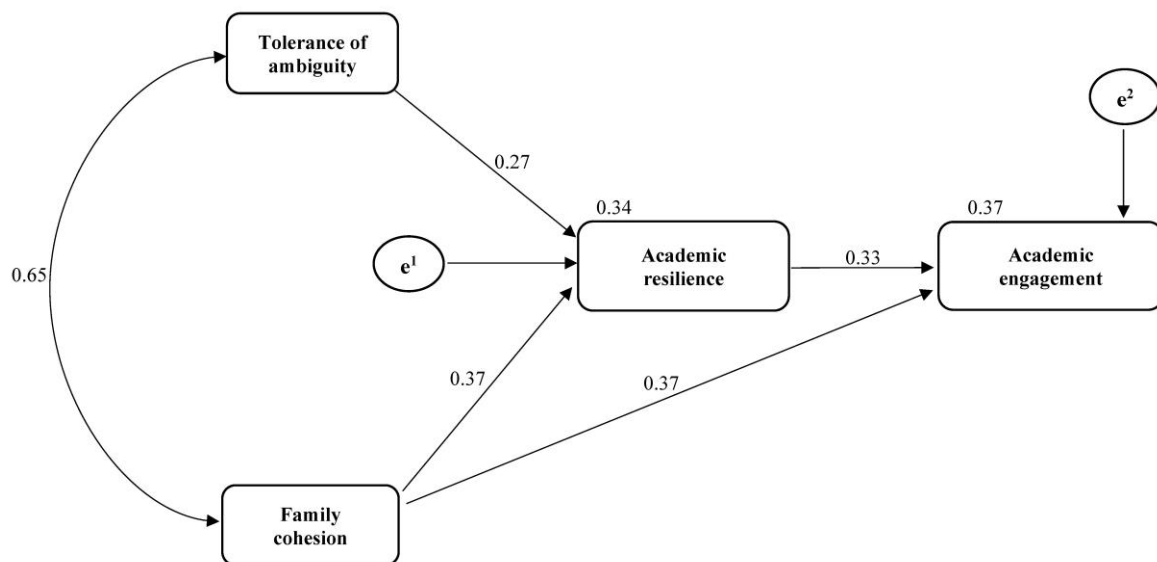


Figure 2. The modified final model of the mediating role of academic resilience in the association of tolerance of ambiguity and family cohesion with academic engagement

Moreover, there was a positive relationship between family cohesion and academic resilience ($P= 0.001$), and between academic resilience and academic engagement ($P= 0.001$). There was no significant relationship between tolerance of ambiguity and academic engagement in the female high-school students ($p>0.05$).

The indirect path from tolerance of ambiguity to academic engagement through the mediating role of academic resilience was significant ($\beta= 0.025$, $P= 0.003$). Moreover, the indirect path from family cohesion to academic engagement through the mediating role of academic resilience was significant ($\beta= 0.237$, $P= 0.003$) (Table 4).

Table 3. Path coefficients of direct effects between research variables in the final modified model.

Path	Path type	Final modified model	
		β	P
Tolerance of ambiguity to academic engagement	Direct	-	-
Family cohesion to academic engagement	Direct	0.365	0.001
Tolerance of ambiguity to academic resilience	Direct	0.274	0.001
Family cohesion to academic resilience	Direct	0.369	0.001
Academic resilience to academic engagement	Direct	0.328	0.001

Table 4. Results of the Bootstrap method for investigating indirect and intermediary paths

Predictor variable	Mediator Variable	Criterion variable	Final modified model	
			Bootstrap	P
Tolerance of ambiguity	Academic resilience	Academic engagement	0.025	0.003
Family cohesion	Academic resilience	Academic engagement	0.237	0.003

Discussion

The present study designed to assess the relationship between tolerance of ambiguity and family cohesion with academic engagement based on mediating role of academic resilience in female students. The results showed that all direct paths, except tolerance of ambiguity tolerance, were significantly correlated with academic engagement. The indirect paths were significantly correlated with academic engagement through academic tolerance. The proposed model had a good fit and is an important step towards understanding effective factors of academic engagement and achievement of students.

The results presented that the relationship between ambiguity tolerance and academic engagement was not statistically significant. This finding is inconsistent to the result of studies done by Shaterian-Mohammadi et al. (9), Radmehr and Karami (11), and Saeedi Mobarakeh and Ahmadpour (12). In the aforementioned studies, correlation coefficient and regression results showed a significant relationship between ambiguity tolerance and academic engagement; whereas, the present study investigated these hypotheses using the path analysis and the results showed that there was a significant relationship between tolerance of ambiguity and academic engagement in the Pearson correlation test. However, because of the presence of mediating variables, the total effect of tolerance of ambiguity on academic engagement has been clarified through the mediating variable, i.e., the indirect relationship. In this model too, the tolerance of ambiguity has an impact on academic engagement; however, this

impact is indirect. Thus, this result is somehow in compliance with previous studies. In other words, tolerance of ambiguity indirectly affects academic engagement. Therefore, students' tolerance of ambiguity has a considerable effect on their academic resilience which, in turn, affects their academic engagement.

To explain this finding, it can be said that the constructive role of the tolerance of ambiguity in educational subjects is inevitable. A significant role of the tolerance of ambiguity, along with other involved educational variables can inform instructors about the importance of the learners' characteristics. In fact, when learners with a moderate-to-high capacity to learn are informed about the teaching context and method by their instructors and educational programs are made by their involvement, they will have a higher degree of commitment and be more encouraged towards learning. In other words, tolerance of ambiguity facilitates the acceptance of statements that contrast the system of beliefs or knowledge of an individual. As a result, tolerance of ambiguity can be regarded as an important learning style (12).

The results also showed that the relationship of family cohesion with academic engagement was statistically significant. This finding is in contrast to the findings of studies carried out by Shakarami et al. (23) and Motaghd Larijani (32). To explain this finding, it can be said that in addition to education, many factors, such as environment, school, family, parenting style, and social environment, as well as individual characteristics, such as intelligence, personality, and age, have an important role in the academic achievement

of students. Today, families have proved to have a direct and negligible impact on the academic achievement of their children, and subsequently the development of society (32). In general, only people who graduate with being mentally affected by the education system can contribute to their country's progress. It can be claimed that mental health cannot be achieved unless in a healthy family as the first and most important social unit that shapes habits, behaviors, thoughts, and attitudes of their members (23). In a healthy family, the positive and persistent encouragement of children, as a trigger for academic achievement, motivates them to try harder. It can be said that family experience has a considerable impact on a person's development during education and after that. In addition, family relations affect other aspects of a person's life, such as academic achievement.

The results showed that the relationship between academic resilience and academic engagement was significant. This result is consistent with the findings of Shakarami et al. (23) and Celik et al. (24). In other words, academic resilience has a positive significant relationship with academic engagement. To explain this finding, resilience is a coping process and successful adaptation with challenging and threatening conditions. It is positive compatibility to undesired conditions, which contributes to adjustment with different living conditions and mental health, particularly in childhood. Resilience refers to individual differences in coping with and reacting to challenging conditions. Therefore, a person defines resilience as individual differences in coping with difficult situations. A resilient person processes an undesired situation more positively and considers himself/herself capable of dealing with that situation. Since the course of education is accompanied by many stressors in different educational fields, campus environment, and family, and stress disrupts academic

achievement, students with adequate resilience to cope with such stressors can better deal with these problems and stressors and perform better in all of their life and educational areas.

Results also showed that there was a significant relationship between tolerance of ambiguity and academic engagement with mediating role of academic resilience. A similar study was not found in the literature review to compare consistency or inconsistency of results. In the first hypothesis, it was shown that the tolerance of ambiguity was not significantly correlated with academic engagement. The indirect hypothesis showed that the tolerance of ambiguity affects academic engagement only when it first affects students' resilience. To explain, academic engagement is defined as an interaction between better attention and commitment. Students engaged with their lessons are highly attentive and committed because doing homework and related activities are valuable to them. On the other hand, students' tolerance of ambiguity has an important effect on their academic resilience which, in turn, affects their academic engagement. In other words, students with internal value have higher cognitive engagement, motivation, and progress. Regardless of individual differences between students, they should have positive characteristics, such as self-reliance, initiative, learning tendency, active spirit, not passive in learning, and intellectual development. Therefore, academic resilience plays a mediating role in the relationship between the tolerance of ambiguity and the academic engagement of students.

Results also showed that there was a significant relationship between family cohesion and academic engagement with a mediating role of academic resilience. No similar results were found in the literature review. To explain, academic engagement

is defined as an interaction between better attention and commitment. Students engaged with their lessons are highly attentive and committed because doing homework and related activities are valuable to them. On the other hand, family cohesion has an important effect on students' academic resilience which, in turn, affects academic engagement. Students may not give priority to the problems that have no personal value to them. This is because they give value to the homework or activities that contribute to their learning and are useable in the future. When engaging with homework and activities, students try to do their best even in the absence of educational, occupational, or internal incentives; whereas, the obedient students pay attention only to do their homework. This level of attention can continuously change and reduce. For example, a valuable external incentive (high grade, approval of teachers, parents, and those close to students, university entrance, chance of playing in a sports team, etc.) may cause spending a high level of energy but would not engage students. These incentives act only like a tool for attracting the attention and required energy for doing homework; however, in the absence of such incentives, this attention either reduces or even fades away, and the students would not spend more energy because the homework itself does not have any value to them. In fact, attention is created by external incentives, but commitment is created only through personal meanings and values. Therefore, academic resilience plays a mediating role in the relationship between family cohesion and academic engagement.

Limitations

Among the research limitations was the application of self-report instruments, which may affect the accuracy of the reports because of the bias of social utility. Another limitation was the statistical population

limited to female 2nd-grade high-school students of Ahvaz. Therefore, the results should cautiously be generalized to other male and female students in other cities.

Conclusion

Family cohesion and academic resilience had a direct and positive association with academic engagement in female second-grade high-school students, so strengthening and improving family cohesion and academic resilience can improve the academic engagement in students. Since the proposed conceptual model had a good fit, it can be considered an innovation and new scientific finding, which can be effective in preventing and improving academic failure. The education authorities are recommended to consider these psychological structures in the compilation of textbooks and designing educational programs. Families should study these structures and use them in their parenting style to inhibit academic failure and apathy in learning.

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Ethical Approval

The Ethics Review Board of Islamic Azad University Ahvaz Branch, approved the present study with the following number: IR.IAU.AHVAZ.REC.1399.125.

Conflicts of interest

No conflicts of interest declared.

Author contributions

MM, and FH developed the study concept and design. MM acquired the data. FH and RH analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual

content, manuscript editing and read and approved the final manuscript. MM, and FH provided administrative support.

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