

## Research Paper

## Structural Modeling of the Role of Attachment Styles on Students' Academic Motivation Mediated by Academic Self-efficacy



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## ABSTRACT

**Background:** Academic motivation has always been considered by researchers and specialists in educational psychology as a critical and essential aspect of education. With motivation, students follow the necessary mobility to successfully finish an assignment and reach a goal by demonstrating a specific level of proficiency in their work to finally acquire the essential learning and academic success. This study aimed to evaluate the structural modeling of the role of attachment styles among students mediated by academic self-efficacy.

**Methods:** This analytical cross-sectional research was conducted using structural equations. The research population included all high school students (n=3057) in the seventh, eighth, and ninth grades living in Gonabad City, Iran, in 2019-2020, of whom 1646 were girls and 1411 boys. A total of 250 students were selected by multi-stage cluster random sampling method based on principles of structural equations sampling. After obtaining informed consent, all participants completed the situational motivation scale, the Morgan-Jinks student attachment styles, the cognitive emotion regulation questionnaire, revised adult attachment scale, and the classroom environments questionnaire. Then, the data were collected and analyzed through the Pearson correlation method and structural equations in SPSS software version 19 and AMOS version 20.

**Results:** Academic self-efficacy (0.20) and attachment styles (-0.15) directly and significantly affected academic motivation. In addition, attachment styles (-0.23) had a direct and significant effect on academic self-efficacy. There was an indirect relationship between emotional regulation (-0.07) and mediated academic self-efficacy on academic motivation (P<0.01).

**Conclusion:** The attachment styles model owes a good fit to students' academic motivation with the mediating role of academic self-efficacy. Therefore, the awareness of teachers, parents, principals, and other educational experts can improve students' academic motivation.

**Keywords:** Academic motivation, Academic self-efficacy, Attachment styles

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## 1. Introduction

Educational psychologists and researchers have always considered academic motivation a critical aspect of education. In psychology, “motivation” refers to the onset, direction, intensity, and resistance of behavior [1]. Academic achievement motivation is one of the essential criteria for learning and significantly affects individual performance. In other words, academic motivation is the main factor in learning and progress in the classroom [2]. However, declining academic motivation and failure are significant challenges to the education system in countries that waste many resources [3]. Academic motivation refers to the internal processes that motivate people to engage in activities and keep them going to attain specific academic goals. Motivation is the foundation of learning and one of the essential aspects in determining whether a student will succeed or fail in school [4]. According to the self-determination theory, academic motivation should consider three key constructs: internal motivation, external motivation, and motivation. Internal motivation spontaneously and internally moves people to perform a specific task regardless of external rewards. However, in external motivation, people are forced to perform tasks due to external rewards and reinforcements. Finally, unmotivated people receive no motivation and avoid doing their activities [5]. As a result, students with academic motivation develop the essential mobility to complete a task, reach a goal, or acquire a specific level of competence in their work, allowing them to achieve the necessary learning and academic success [6].

There are two types of factors that influence students' academic motivation: external and internal motivation. Economic and social position are examples of external (environmental) factors, while personality traits such as metacognitive skills, flexibility, identity, and emotion regulation skills are examples of internal (personality) skills [7]. An important part of a child's upbringing occurs in the family unit. The child learns communication in this context, and attachment develops due to that communication. The highlighted characteristic of attachment is the emotional bond between two people forming a psychological sense of security. Individuals experience different stages of attachment in childhood [8]. Students with secure attachment in academic achievement and performance act differently in increasing motivation than students with insecure attachment (avoidance, anxiety, and ambivalence) [9]. A study revealed a significant and positive relationship between self-efficacy and

safe attachment style with the motivation for academic achievement [10].

Another study indicated that mother attachment styles are effective in students' academic motivation and improve students' academic performance [11]. The results of a study stated that the predictor variables of avoidant attachment style, secure attachment style, anxious attachment style, and family health explained the variance of academic self-efficacy among students. The mentioned styles play a more significant role in predicting academic self-efficacy [12]. Researchers also found that students with positive beliefs about their abilities had the better motivation and academic performance. In contrast, low self-efficient students with negative judgments about their abilities had poor motivation and performance in academic affairs [13].

Self-efficacy is an essential concept in Albert Bandura's social learning theory, denoting that perceiving one's ability to perform an activity creates a consequence to deal with and control a situation. According to this theory, regardless of their skills, individuals act according to their judgment of efficiency and effectiveness for various activities to cope effectively with difficult situations and achieve desired goals.

In this theory, all psychological and behavioral processes are based on a sense of self-efficacy and personal mastery [14], and academic self-efficacy is one of its most critical dimensions [15]. Researchers believe that students with high academic self-efficacy are more confident in doing their assignments than students with low academic self-efficacy. Higher levels of academic self-efficacy lead to higher grades and stability in completing assignments. Thus, academic self-efficacy helps students make correct decisions in stressful situations, promoting academic achievement and motivation [16]. In a study entitled “The relationship between teaching emotion regulation on self-efficacy and academic motivation”, students found that emotion regulation can affect self-efficacy and increase emotional regulation [17].

Several types of research have revealed that self-efficacy improves motivation, resilience, and perseverance in the face of difficulties. Also, a greater sense of academic self-efficacy will lead to greater academic motivation [17].

Scientists believe motivation is one of the most popular concepts and critical factors for success in higher education. Identifying the concept of motivation and different types of motivation, as well as their effect on the learners'

learning process, helps teachers to use better methods in designing and implementing their educational programs. Students' academic motivation and interest are among the most critical challenges in educational environments, which significantly affect the output of educational systems [18]. The role of attachment styles and academic self-efficacy are essential and undeniable in the promotion of academic motivation. Some researchers believe that motivated students do not engage in abnormal behaviors in environments due to their innate tendency to seek and conquer challenges as personal goals and interests, as well as essential and valuable goals in their learning process [17]. Since self-efficacy refers to the nature of one's beliefs and cognitive and emotional evaluations, people with emotional skills know, regulate, understand, and deal with their emotions well to be successful and efficient in various fields. Therefore, ignoring cognitive emotion regulation skills can lead to significant problems among students [19]. Research on these variables shows the importance of emotional regulation and academic motivation as internal variables in students' education. Due to the lack of studies on the simultaneous relationship of the three variables (attachment style, academic self-efficacy, and academic motivation) mentioned in the target population in Iran, a research gap is felt in this area. This study aimed to determine the role of emotional regulation on academic motivation among students based on attachment style and examine the mediating role of academic self-efficacy in this regard.

## 2. Methods

This quantitative-correlational research was conducted using structural equations. The research population included all high school students (3057 people) in the seventh, eighth, and ninth grades living in Gonabad City, Iran, in 2019-2020, of whom 1646 were girls and 1411 boys. A total of 250 people were selected as a sample group by multi-stage cluster random sampling method based on principles of structural equations sampling. The reason for selecting this number of samples, according to experts, is that the minimum sample size for modeling structural equations is as much as 100 to 150 people; however, some studies suggest more than 200 people [20]. To reduce sampling error and enhance the generalization of the results to the entire statistical population, the sample size was increased to 250 subjects. On the other hand, it is suggested to consider 10 to 20 people for each obvious variable to estimate the sample size [21]. Therefore, 200 students were selected, and the sample size was increased to 250 to reduce the sampling error and increase the ability to correct the results for the

entire statistical population. In the multi-stage cluster random sampling method, three girls' and three boys' schools were randomly selected from 25 girls' and boys' secondary schools in Gonabad (6 schools). In the next step, three flutes were selected in each school referring to the selected schools, and then 42 samples were randomly selected in each class based on the list of students. The inclusion criteria included studying in the seventh, eighth, and ninth grades of high school, willingness to participate in research with written consent, the age range of 12 to 15 years, and no history of physical problems, mental disorders, and learning disabilities based on health records. The exclusion criteria were students' unwillingness to cooperate in the study and incomplete answers to the questionnaires. The questionnaires were completed in schools before the COVID-19 outbreak, and the incomplete questionnaires were followed up due to the lockdown, which the school principal resolved.

### Research instruments

The situational motivation scale was designed by Sinclair and McInroy (1992) in Australia. The short form of this questionnaire was made by Bahrani (1993) in Shiraz, Iran, with 49 phrases scored on the Likert scale from "completely disagree" (1) to "completely agree" (5), containing 11 factors [22]. In this questionnaire, 5, 4, 3, 4, 5, 4, 4, 5, 4, 6, and 5 items measure goal-orientation, competitiveness, the tendency to work and assignment, the tendency to progress, social dependence, social assistance, fame-seeking, power-seeking, self-esteem, and self-reliance, respectively. The minimum score for each subject is 49, and the maximum score is 96. A lower score indicates a decrease in motivation, and closeness to the maximum score indicates an increase in motivational knowledge. Scoring in items 3, 7, 18, 23, 31, 39, and 44 is inverse, and the reliability of the questionnaire was found to be 0.95 by retesting [21]. The reliability of this questionnaire was evaluated by the Cronbach alpha method, which was 0.91 for the total academic motivation and 0.68, 0.71, 0.62, 0.73, 0.68, 0.57, 0.63, 0.72, 0.62, 0.73, and 0.70 for goal-orientation, competitiveness, the tendency to work and assignment, the tendency to progress, social dependence, social assistance, fame-seeking, power-seeking, self-esteem, and self-reliance, respectively.

Collins and Reed's adult attachment scale was designed by them in 1990 and revised in 1996. The questionnaire has 18 items and scored on a 4-point Likert scale from "completely disagree" (1) to "completely agree" (4). The questionnaire has 3 subscales with 6 items:

**Dependence (D):** It assesses how much people trust and rely on others to evaluate whether they are accessible when needed.

**Closeness (C):** It measures the degree of comfort concerning intimacy and emotional closeness.

**Anxiety (A):** It measures fear of having a relationship (Collins and Reed, 1990).

Accordingly, 3 styles of secure attachment (items 1, 6, 8, 12, 13, and 17), avoidance (items 2, 5, 7, 14, 16, and 18) and ambivalent (items 3, 4, 9, 10, 11, and 15) can be obtained. The duration of completing Collins

**Table 1.** Descriptive indicators and normality of research variables

	Variables	Min	Max	Mean±SD	Skewness	Kurtosis
Academic motivation	Goal-orientation	14	25	22.00±2.22	-0.969	1.269
	Competitiveness	7	20	16.53±3.31	-1.089	0.517
	Tendency to work	6	15	12.39±2.19	-0.804	-0.015
	Tendency to progress	8	20	17.19±2.66	-0.899	0/007
	Social dependence	8	25	21.31±2.81	-0.903	1.229
	Social assistance	10	20	16.72±2.58	-0.460	-0.667
	Fame-seeking	9	20	17.78±1.94	-01.014	1.299
	Material reward	14	25	21.91±2.39	-0.953	0.578
	Power-seeking	10	20	17.37±2.32	-0.782	-0.085
	Self-esteem	12	30	25.20±3.77	-0.767	-0.008
	Self-reliance	13	25	21.61±2.81	-1.054	0.702
	Total academic motivation	130	245	223.11±26.91	-1.708	1.548
Attachment styles	Secure attachment style	6	20	15.60±3.33	-0.437	-0.737
	Avoid attachment style	7	20	15.35±3.11	-0.294	-0.868
	Ambivalent attachment style	7	20	15.77±3.18	-0.474	-0.457
	-	4	20	16.14±3.40	-0.873	0.134
	-	5	20	15.37±3.28	-1.196	0.940
	-	4	20	15.01±4.09	-0.775	-0.343
	-	4	20	15.50±3.74	-0.722	-0.066
	-	5	20	15.50±3.63	-0.904	0.219
	-	6	20	15.63±3.27	-0.568	-0.384
	-	72	177	148.64±25.14	-1.034	0.837
Academic self-efficiency	Effort	19	38	32.85±3.54	-0.572	0.911
	Context	20	40	31.31±4.88	0.306	-0.759
	Talent	17	39	31.69±4.53	-0.542	0.002
		Total academic self-efficiency	56	116	101.30±14.23	-1.249



**Table 2.** Correlation matrix of research variables

Variables	1	2	3	4	5
1. Academic motivation	1				
2. Academic self-efficacy	0.399*	1			
3. Secure attachment style	0.304	0.306	1		
4. Avoidant attachment style	-0.360	-0.443	-0.467	1	
5. Ambivalent attachment style	-0.344	-0.403	-0.450	-0.433	1

\* All correlations are significant at the level of  $P < 0.01$ .



and Reed's adult attachment scale is 10 minutes, based on the field study. This questionnaire can be administered individually or in groups. Execution instructions are given to the subject in the questionnaire. Given that the Cronbach alpha values are 0.80 in all cases, the test is highly valid. On the other hand, the validity test in a retesting study was determined as a correlation between these two implementations. This questionnaire was distributed among 100 girls and boys in the second grade of high school [23]. The findings of two rounds of this questionnaire with a one-month delay revealed that this test is valid at the 0.95 level. The Cronbach alpha method was used in the present study to evaluate the questionnaire's reliability as much as 0.64, 0.66, and 0.74 for secure, avoidant, and ambivalent attachment styles, respectively [24].

The Morgan-Jinks student efficacy scale was developed by Morgan et al. This scale has 30 questions and three subscales of effort, context, and aptitude. The items on this scale are scored on the 4-point Likert scale from "completely disagree" (1) to "strongly agree" (4). The internal consistency of the scale was reported as 0.82 using the Cronbach alpha method, and the Cronbach alpha coefficients of the three subscales of talent, effort, and context were reported as 0.78, 0.66, and 0.70, respectively [25]. Karimzadeh et al. reported the validity of this scale through favorable factor analysis in Iran. The scale's reliability coefficients were obtained through the Cronbach alpha method for overall self-efficacy (0.76), talent (0.66), effort (0.65), and context (0.60) [25]. The Cronbach alpha method was used to evaluate the questionnaire's reliability, which was 0.75 for the

whole questionnaire and 0.65, 0.66, and 0.74 for each one of the subscales of talent, effort, and context, respectively.

In this study, data collection was conducted through library and field methods. Given the measurement instrument in the questionnaire, the researcher provided sample questionnaires to individuals and performed the research by survey method. Initially, the code of research ethics (IR.IAU.QAENAT.REC.09.24.2.129) was received from the Research Ethics Committee of the Islamic Azad University, Ghayenat Branch. Research questionnaires were distributed among members after obtaining informed consent, identifying individuals, and determining the sample size. Questionnaires were administered to the sample with no time limit for completing them. The data were collected and imported into the software after completing the questionnaires. Demographic characteristics and descriptive statistical indices (mean, standard deviation, the lowest and the highest score, frequency, and percentage) were used to describe the research information, and skewness and kurtosis indices were used to test the assumption of close data distribution. All statistical analyses were performed using SPSS software version 19 and AMOS version 20.

### 3. Results

A total of 250 students aged 12 to 15 years, 112 (44.8%) boys and 138 (55.2%) girls, participated in this study. In addition, 86 students (34.4%), 64 (25.6%), and 100 (40%) were studying in the seventh, eighth, and ninth grades, respectively. The mean and standard deviation of research variables are presented in Table 1.

**Table 3.** Fit indicators for the final research model

AGFI	GFI	IFI	CFI	NFI	RMSEA	$\chi^2/df$	P	df	$\chi^2$
0.89	0.90	0.92	0.92	0.92	0.080	2.276	0.001	52	118.36

AGFI: adjusted goodness of fit index; GFI: the goodness of fit index; CFI: comparative fit index; IFI: incremental fit index; NFI: normed fit index; RMSEA: root mean square error of approximation



**Table 4.** Estimation of direct, indirect, and total effects for the structural model

Paths		Direct Effects		Indirect Effects			Total Effects	
		Effect	Sig.	Effect	Upper Bound	Lower Bound	Effect	Sig.
To academic motivation	Academic self-efficacy	0.20	0.002	---	---	---	0.20	0.002
	Attachment styles	-0.15	0.013	-0.07	-0.188	0.241	-0.022	0.002
To academic self-efficacy	Attachment styles	-0.23	0.001	---	---	---	-0.23	0.001

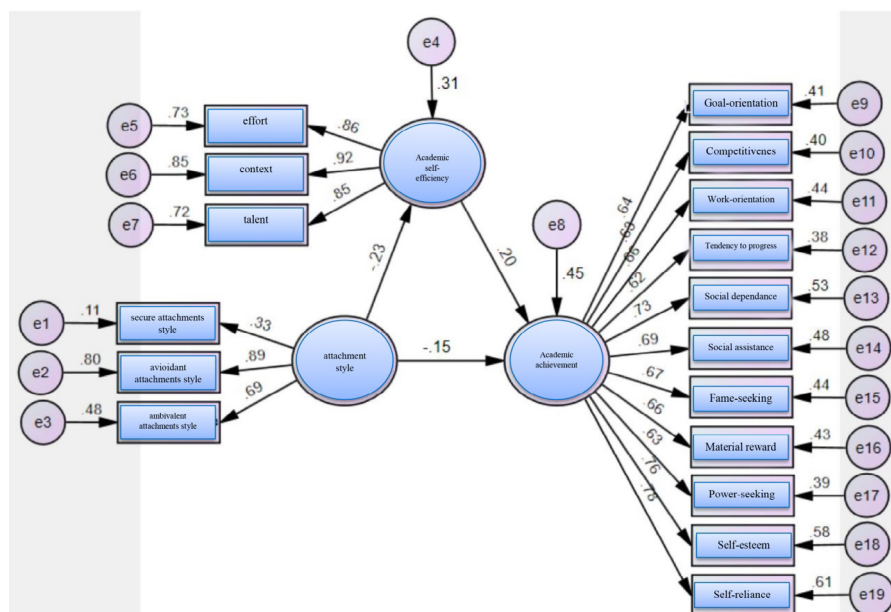


According to Table 1, the skewness and kurtosis indicators are between -2 and 2, indicating that the variable score distribution does not deviate too much from the normal distribution [26]. The correlation matrix of research variables is presented after reviewing the descriptive findings (Table 2).

There is a positive and significant relationship between academic motivation, emotional regulation, and academic self-efficacy. Emotional regulation has a positive and significant relationship with academic self-efficacy, and all correlations are significant at  $P < 0.01$ . The structural equations are presented after examining the correlation between research variables in the continuation of modeling findings. Initially, the overall status of the data was examined, the univariate outlier data was checked using a box plot, and the results showed no data outage. The data normality was examined using skewness and kurtosis scores, and the results showed that the data were normal. The maximum likelihood, root mean square er-

ror of approximation (RMSEA), standardized root mean square residual, comparative fit index (CFI), normed fit index (NFI), the goodness of fit index (GFI), and adjusted goodness of fit index (AGFI) were used to estimate the model. Experts have proposed numerous fits for fitness indicators. For example, a value equal to or less than 0.05 for RMSEA, a value equal to or greater than 0.96 for the CFI, and a value equal to or less than 0.07 for the standard root of the variance is a good fit of a model [27]. On the other hand, the indicators of the CFI, GFI, and AGFI greater than 0.9 and RMSEA less than 0.05 relies on a perfect fit, and less than 0.1 indicates a good fit [28]. The fitness indicators of the final research model are presented in Table 3.

According to Table 3, most fit indicators are good, and the model fits with the data. The following are the direct, indirect, and total effects of each variable.



**Figure 1.** Model of the effect of attachment style on academic motivation with the mediating role of academic self-efficacy

Table 4 shows that attachment style directly affected academic motivation (-0.022) and academic self-efficacy (0.23). Moreover, academic self-efficacy directly and significantly affected (0.20) academic motivation. Emotional regulation indirectly (-0.07) and significantly affected academic motivation, and the variable of academic self-efficacy had a mediating role. The bootstrap method has been used to evaluate the significance of this effect, indicating that the upper and lower bounds were positive without zero in this range, and this relationship is significant. Finally, the standardized path coefficients of the research model can be observed in Figure 1 after examining the significance of the paths.

#### 4. Discussion

According to the results of this study, attachment styles positively, directly, and significantly affect academic motivation and self-efficacy. In addition, there was a positive, direct, and significant relationship between academic self-efficacy and motivation. Furthermore, emotional regulation indirectly, positively, and significantly affects academic motivation due to academic self-efficacy. These results were consistent with previous studies [11, 29-33]. In line with this study, another research showed that attachment styles to the mother predicted 36% of changes in academic motivation [11]. It can be concluded that mother attachment styles are effective in students' academic motivation and thus improve students' academic performance, which is consistent with the results of this study [30]. Furthermore, the high correlation between secure attachment styles and behavior was investigated, and the ambivalent style had a very low correlation with self-regulation and motivation. This study showed that secure attachment styles positively correlate with academic motivation; however, avoidant and ambivalent attachment styles negatively correlate with academic motivation. These results were in line with these research findings [31].

Another study aimed at investigating the relationship between attachment styles and perception of parent-child interactions, including involvement, availability, autonomy support, and warmth with motivation and academic achievement of students. The results showed that attachment styles are significant predictors of intensity, quality, the durability of motivation, and academic achievement, which is consistent with the results of this study [34]. A study showed that attachment styles have a moderating role in academic motivation and academic self-efficacy [33]. In addition, research findings show that children with a safe attachment style are better equipped and more acces-

sible to meet the expectations of the school environment. They found that children who interacted more with their parents, teachers, and peers performed better and were more motivated in school [32].

Attachment styles consist of 3 components: the two components of avoidant and ambivalent attachment styles achieved higher factor loading, but secure attachment styles gained less factor loading in the confirmatory factor analysis of the measurement model. Therefore, students who use avoidant and ambivalent attachment styles evade some of the challenges of studying, which leads to low academic motivation. However, secure attachment styles in students lead to better opportunities and self-confidence in education and higher academic motivation. Family and school are two important contexts in the growth and development of children and two fundamental sources in creating attachment styles. Therefore, parents and educators are obliged, with their empathetic and authoritative support, to educate the next generation so that, with a sense of complete security and a secure attachment style, they can fulfill their most important task of learning and cultivating their talents and abilities. The results also showed that attachment styles have a negative, direct and significant effect on academic self-efficacy.

Academic self-efficacy improves students with decreasing attachment styles, which is consistent with the results of previous studies [10, 35-38]. In line with the results of this study, previous studies showed that emotional support and safe and healthy characteristics of parent-family attachment styles increase students' academic competence and self-efficacy and effectively motivate and improve students' academic performance [37].

In a study entitled "The mediating role of emotion regulation and coping strategies concerning parenting and peer attachment styles on academic self-efficacy", the findings showed that parenting attachment styles are related to students' academic self-efficacy, and this finding can be consistent with the results of this study [35]. In addition, another study showed that attachment styles had a significant relationship with self-efficacy, which was somewhat consistent with the results of this study [38]. On the other hand, the findings of another study similarly showed a significant relationship between some attachment styles and self-efficacy. In other words, there is a significant positive relationship between secure attachment style and self-efficacy and a significant negative relationship between anxiety attachment style and self-efficacy [12].

In addition, a study entitled “Relationship between self-efficacy and attachment styles with achievement motivation of female high school students” revealed a significant and positive relationship between self-efficacy and secure attachment style with achievement motivation of subjects. A study entitled “The role of family health and attachment styles in predicting students’ academic self-efficacy” showed that the predictor variables of avoidant attachment style, secure attachment style, anxious attachment style, and family health explained the variance of students’ academic self-efficacy and played a greater role in predicting academic self-efficacy [36].

Positive, direct, and significant relationship between academic self-efficacy and motivation. Furthermore, emotional regulation indirectly, positively, and significantly affects academic motivation due to academic self-efficacy. These results were consistent with previous studies [11, 29-33]. In line with this study, another research showed that attachment styles to the mother predicted 36% of changes in academic motivation [11].

As one of the limitations of the present study, most of the findings were obtained through a self-report questionnaire, and it is unclear how much they are related to actual behaviors in everyday life. Another important limitation of this study was the coincidence of this study with COVID-19, which caused lockdowns in most schools and the lack of access to students. However, the questionnaires were completed before the outbreak in schools, and the follow-up on incomplete questionnaires was difficult. An important limitation of this research was related to the spatial and temporal location of the study. This research was conducted on students aged 12 to 15 in Gonabad City, Iran, in the academic year of 2019-2020, and the findings cannot be generalized to other students in other cities. Precautionary measures should be taken in case of generalization. Another limitation of this research was related to the research method.

## 5. Conclusion

According to the results, attachment styles to the primary caregiver affect a person’s feelings and beliefs about self-efficacy, dignity, and self-confidence. Using avoidant and ambivalent styles leads to less confidence in beliefs and abilities as a kind of anxiety and hesitation. People with safe attachment style trust their beliefs because of their deep attachment styles and try to recognize their abilities and be effective in various fields of study. Attachment styles are one of the factors affecting students’ academic self-efficacy. According

to the previous theoretical foundations and the results of this study, it can be said that attachment directly affects students’ academic self-efficacy.

This study examined the causal relationships and the correlations between the variables, but obtaining these findings using other research methods, such as psychological interventions, can be considered. Students’ mismatch in culture and socio-economic class can be another limitation of this study. Based on these limitations, it is recommended to conduct this research on other students in other geographical areas to compare the results. Due to using the correlational method in this study, it is suggested to examine the relationship between these variables using other methods. Researchers are advised to investigate the role of emotion regulation, academic self-efficacy, and academic motivation along with other variables, including academic achievement, academic adjustment, academic retention, resilience, happiness, and academic vitality. Using other variables leads to a coherent knowledge about the mentioned variables and the relationships of this structure with other structures with more capabilities in the relevant planning. Programs such as lectures and special education sessions can effectively improve students’ academic motivation with regard to the prominent role of emotion regulation and academic self-efficacy in academic motivation. It is recommended to use this model to design a psychological intervention model to improve academic motivation in students. It is possible to provide training to improve students’ academic motivation based on the findings of this model. The principles of academic motivation, academic self-efficacy, and emotional regulation are suggested to be addressed in educational, social, and communication media and viewed as a national movement to make necessary changes in public, especially students.

## Ethical Considerations

### Compliance with ethical guidelines

The Research Ethics Committee of the Islamic Azad University, Qaenat Branch approved this study (Code: IR.IAU.QAENAT.REC.09.24.2.129). Written consent was obtained from all the samples examined.

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### Authors' contributions

Conceptualization: Najmeh Sadat Haji Vosough, Jahanshir Tavakolizadeh, and Majid Pakdaman; Data analysis and Methodology: Najmeh Sadat Haji Vosough; Writing—original draft: Najmeh Sadat Haji Vosough and Jahanshir Tavakolizadeh.

### Conflict of interest

The authors declared no conflict of interest.

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