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Original Article

The Mediating Role of Academic Hope in the Correlation of Ambiguity Tolerance and Academic Flourishing with Academic Engagement in Female High School Students

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Abstract

Background: Students with academic flourishing can deal with stressful situations with a positive and optimistic view. The present study aimed to investigate the mediating role of academic hope in the association of ambiguity tolerance and academic flourishing with academic engagement in students.

Methods: This research was a descriptive correlational study using structural equation modeling. The research population comprised female senior high school students of Ahvaz in the school year of 2020-21. Herein, we recruited 216 female senior high school students selected through random cluster sampling. Data were collected with the Schoolwork Engagement Inventory, the Ambiguity Tolerance Scale, the Academic Flourishing Questionnaire, and the Academic Hope Scale questionnaires. The proposed model was analyzed using the path analysis method.

Results: The results indicated a correlation between academic engagement and tolerance of ambiguity (r=0.41), academic flourishing (r=0.47), and academic hope (r=0.48). Moreover, there was a correlation between tolerance of ambiguity and academic flourishing (r=0.51) and academic hope (r=0.48). According to the results, the association of academic flourishing with academic engagement and academic hope was significant in the students (P<0.001). There was also a close association between tolerance of ambiguity and academic hope in the students (P<0.001). Additionally, the association between academic hope and academic engagement was significant in the subjects (P<0.001). Academic hope had a mediating role in the association between tolerance of ambiguity and the academic engagement of the female students (P<0.001). The indirect path of academic flourishing to academic engagement was significant with the mediating role of academic hope (P=0.003).

Conclusions: The results indicated that the proposed model is of the desired fitting. It is a great step toward understanding the factors associated with students' academic engagement and achievement. Furthermore, it is an appropriate model, through the use of which various programs can be developed and designed to prevent academic failure and demotivation in students.

Keywords: Hope, Work engagement, Ambiguity, Flourishing, Students

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1. Introduction

Nowadays, families and authorities involved in education are quite concerned regarding the academic failure of students (1). In addition, students' academic achievement lays the groundwork for sustainable improvement and development of the quality of education, which is effective in identifying bottlenecks and obstructions of the educational system and proposing accurate scientific solutions to resolve them. Furthermore, it was concluded that examining academic achievement is conducive to augmenting the quality of educational activities (2).

In light of that, students' academic engagement is one of the crucial indices in the assessment of educational systems. Accordingly, students' success is appraised by their academic engagement and performance (3). Therefore, students' involvement with educational topics and schoolwork plays a crucial role in their success (4). In view of that, research psychologists are mainly concerned with determining the most appropriate criteria and variables for investigation and prediction of the academic status of a student, which has resulted in numerous studies in the field of effective factors in academic engagement and performance (5).

Based on their personality traits, learners take a specific type of homework into consideration and believe it to be valuable and significant. One of these traits is the tolerance of ambiguity (6). There is an association between ambiguity tolerance and academic engagement (7). Ambiguity tolerance is characterized by acceptance of uncertainty as a part of life, which is the ability to continue life

with inadequate knowledge and the tendency to commence a direct activity without knowing whether they can succeed or not (8). In separate studies, Radmehr and Karami (9) and Shaterian Mohammadi and colleagues (10) demonstrated that tolerance of ambiguity boosts students' academic engagement.

Another factor affecting the academic engagement of students is academic flourishing. Flourishing refers to having a positive view of the world and the events happening in life, as well as the ability to deal properly with realities in life (11). This feature impacts individuals' behavior in dealing with stressful experiences and anything they are coping with in their academic lives. The concept of flourishing is at top of Maslow's hierarchy of needs, which is regarded as the final stage of the psychological development of an individual (12, 13). Having directed the flourishing, students can face stressful situations with a positive and optimistic view and perfectly assess their abilities to deal with problems, thereby enjoying higher academic buoyancy (14). Flourishing refers to a personal attitude toward academic life. When faced with problems, these individuals demonstrate further flexibility and will be more vivacious (15).

A crucial factor influencing the tolerance of ambiguity and academic flourishing in students, which contributes to an increase in their academic engagement, is academic hope. The theory of hope is the most critical factor affecting academic motivation and achievement. This theory is based on positive psychology and is regarded as one of the new motivational models for educational studies (16). Academic hope is a dynamic motivational-cognitive system with numerous desirable effects in various fields, such as education (17).

According to all the aforementioned factors, it can be argued that academic engagement in the educational environment refers to learners' behaviors toward learning and achievement. Students motivated to learn a topic are well prepared for carrying out activities that facilitate learning. On the other hand, unmotivated students, in terms of learning, do not act systematically in their endeavors to learn and will be distracted in the classroom and lack organization. They will not even review and repeat the subjects. Accordingly, the present research aimed to investigate the association of ambiguity tolerance and academic flourishing with academic engagement through the mediating role of academic hope in female students.

2. Methods

This was a descriptive and correlational study where the association between certain variables is examined through path analysis. The study population of the research comprised female senior high school students of the city of Ahvaz in the school year of 2020-21. Using the random cluster sampling method, 216 female senior high school students were selected. To select the sample, one of the education districts of Ahvaz was chosen via simple random sampling. Subsequently, one of the female senior high schools in this district was randomly selected.

2.1. Instruments

The Schoolwork Engagement Inventory: This questionnaire was designed by Salmela-Aro and Upadaya (18). It consists of nine items and three subscales, namely energy (three items), dedication (three items), and absorption (three items). The participants responded to each item based on a seven-point scale ranging from never (0) to every day (6). To psychoanalyze the Schoolwork Engagement Inventory, Salmela-Aro and Upadaya (18) conducted research between two groups of participants from two age ranges of early adolescence and late adolescence. The results of the statistical analysis of the confirmatory agent of this questionnaire among the late adolescence group experimentally substantiated the three-agent structure of the Schoolwork Engagement Inventory, including energy, dedication, and absorption. In their study, Salmela-Aro and Upadaya (18) obtained the coefficients of internal consistency of the overall agent of academic engagement and subscales of energy, dedication to schoolwork, as well as absorption with schoolwork to be 0.94,0.82, 0.87, and 0.80; this indicates the appropriate validity of the scale. The reliability and validity of this questionnaire were confirmed by Kamari and colleagues (19). The Content Validity Ratio (CVR) and Content Validity Index (CVI) of this questionnaire were reported to be respectively 0.96 and 0.97 in Iran (19).

Ambiguity Tolerance Scale: This scale was

developed by Mclain (20) for assessing the tolerance of ambiguity. Ambiguity Tolerance Scale is constituted by 13 items, each of which is answered with a seven-Point Likert scale ranging from 1(totally disagree) to 7 (totally agree). However, items 1, 2, 3, 4, 5, 6, 9, 11, and 12 are reverse-scored. The score ranging from 13 to 30 show low ambiguity tolerance, 30 to 45 moderate ambiguity tolerance, and above 45 denote high ambiguity. Mclain (20) reported its appropriate internal reliability to be 0.82 and confirmed the validity of the scale. The CVR and CVI of the Persian version of the scale were reported to be respectively 0.81 and 0.85 in Iran (21).

Academic Flourishing Questionnaire: This questionnaire was developed by Diener and colleagues (22), with eight items. It is scored on the basis of a seven-point Likert scale ranging from totally disagree (1) to totally agree (7). The minimum and maximum scores of the academic flourishing questionnaire are 8 and 56, respectively. The highest score manifests high levels of flourishing in an individual. Soleimani and colleagues (23) reported the reliability of this questionnaire to equal 0.87 based on Cronbach's alpha coefficient. The validity of the Persian version of the questionnaire was evaluated by 10 experts (CVI=0.91, CVR=0.88) (23).

Academic Hope Scale: The academic hope scale was developed by Khormaee and Kamari (24), including 27 items. This scale measures academic hope with regard to four dimensions, namely the hope to seize opportunities, the hope to attain life skills, the hope regarding the usefulness of school, and the hope to obtain competency. It is scored on the basis of a five-point Likert scale ranging from totally disagree (1) to totally agree (5). Items 6, 9, 10, 11, 13, 21, 24, and 27 are reverse-scored. The validity of this tool was investigated and confirmed by its designers using the exploratory factor analysis regarding the principal components. The CVR and CVI of the scale were reported as 0.82 and 0.88, respectively (24).

2.2. Statistical Analyses

The proposed model was assessed through path analysis. SPSS and AMOS version 25.0 were utilized for the data analysis. Data were analyzed with descriptive and inferential statistics, including mean, standard deviation, and Pearson correlation coefficient.

3. Results

This study recruited female students with an average age of 16.19±1.36 years old. The inclusion criteria were providing informed consent for participation in the research, having no mental disorders, and being in the age range of between 15-17 years. The exclusion criteria were distorted questionnaires or failure to answer all the questions. Table 1 shows the descriptive statistics of the research variables. Correlation test results revealed a positive and significant correlation between all the research variables at the level of P<0.01. The path analysis was used for assessing the proposed model. Figure 1 illustrates the initial proposed model in order to describe academic engagement on the basis of ambiguity tolerance, academic flourishing, and academic hope.

Taking into account the data in Table 2, the root mean square error of approximation (RMSEA=0.410) indicated that the initial model requires revision. The initial model was saturated. It signifies that all the possible paths were illustrated. The chi-square and other indicators could not be calculated and after the elimination of the non-significant path (tolerance of ambiguity to academic engagement (β=0.12, P=0.131)), the model was no longer saturated. Thus, chi-square and other indicators were calculated via software. Figure 2 shows the final model in which RMSEA=0.064, implying the good fitting of the model.

Table 3 demonstrates the findings of the path coefficient estimations to examine direct assumptions. According to the results, the

Table 1: Descriptive statistics of the research variables

Variables	M (SD)	1	2	3	4
1- Academic engagement	33.35 (9.27)	1			
2- Tolerance of ambiguity	35.27 (10.50)	0.41**	1		
3- Academic flourishing	86.53 (21.9)	0.47**	0.51**	1	
4- Academic hope	78.52 (19.12)	0.48**	0.48**	0.49**	1

**P<0.01

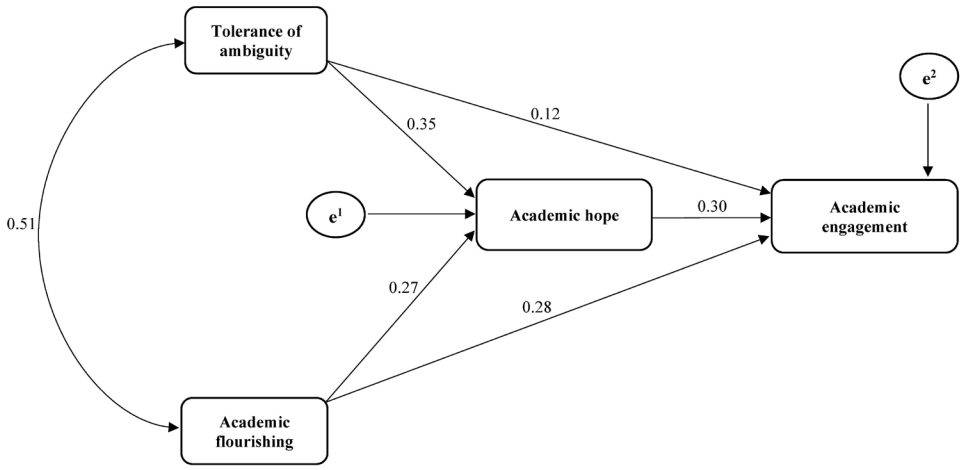

Figure 1: The figure shows the initially proposed model of the research.

Table 2: Fit indicators in the initial and final models

Fit indicators	χ^2	df	(χ^2/df)	TLI	CFI	RFI	NFI	RMSEA
Initial model	-	-	-	-	091	-	0.84	0.410
Final model	2.17	1	2.17	0.94	0.99	0.91	0.98	0.064

χ2: chi-square; df: Degrees of Freedom; TLI: Tucker-Lewis index; CFI: Comparative Fit Index; RFI: Relative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation

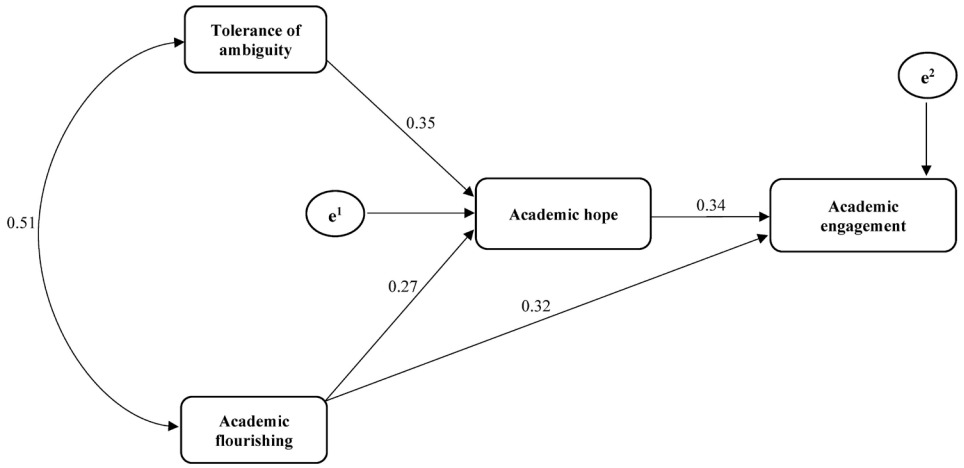

Figure 2: The figure shows the final modified model of the research.

Table 3: Path coefficients of the direct association among the research variables in the final model

Path	Final model	
	β	P
Academic flourishing to academic engagement	0.32	0.001
Tolerance of ambiguity to academic hope	0.35	0.001
Academic flourishing to academic hope	0.27	0.001
Academic hope to academic engagement	0.34	0.001

association of academic flourishing with academic engagement (β=0.32, P<0.001) and academic hope (β=0.27, P<0.001) was significant in the students. There was also a close association between tolerance of ambiguity and academic hope in them (β=0.35, P<0.001). Moreover. The association between academic hope and academic engagement was significant in the participants (β=0.34, P<0.001). There was no significant association between tolerance of ambiguity-related behaviors and academic engagement.

Table 4 represents the significance of the indirect path of tolerance of ambiguity to academic

Table 4: Path coefficients of the indirect association among the research variables in the final model

Predictor variable	Mediator Variable	Criterion variable	Final modified model	
			β	P
Tolerance of ambiguity	Academic hope	Academic engagement	0.34	0.001
Academic flourishing	Academic hope	Academic engagement	0.19	0.003

engagement with the mediating role of academic hope (P<0.001). In addition, the indirect path of academic flourishing to academic engagement was significant with the mediating role of academic hope (P=0.003).

4. Discussion

The findings suggested that the association between academic flourishing and academic engagement was statistically significant. Furthermore, the association between academic hope and academic engagement was statistically significant. According to the findings, the association of ambiguity tolerance and academic engagement with the mediating role of academic hope was statistically significant. Moreover, the association of academic flourishing and academic engagement with the mediating role of academic hope was found to be statistically significant. Nonetheless, the association between tolerance of ambiguity and academic engagement was not statistically significant. This finding does not match the results reported by Radmehr and Karami (9), and Shaterian Mohammadi and colleagues (10). It can be argued that in the mentioned studies, the association between tolerance of ambiguity and academic engagement was examined via correlation coefficient and regression tests; this association was reported to be significant. However, this research studied the hypotheses using path analysis. Accordingly, the Pearson test demonstrated a significant association between the students' tolerance of ambiguity and their academic engagement. Nevertheless, due to the presence of the mediating variable, the total share and effect of the variable of tolerance of ambiguity on academic engagement were described using a mediating variable, an indirect association in other words. Another reason behind the lack of significance of this hypothesis and its contradiction with previous works is its difference in terms of the statistical population. In general, the variable of students' tolerance of ambiguity affects their academic engagement, yet it is indirect.

The role of the structure of the tolerance of ambiguity in educational topics cannot be denied. The significant share of this structure along with other variables involved in the education can make the instructors aware of the fact that despite all the conditions, they must take into account the learner's personality features as well. When learners with moderate or high levels of tolerance of ambiguity are educated by the instructor concerning the content and teaching method, and the academic programs are developed with their cooperation, they feel more responsible and make efforts to learn with further motivation. In other words, the tolerance of ambiguity facilitates accepting propositions that contradict the system of beliefs or the structure of the knowledge of the individual. In light of that, propositions can be regarded as one of the important styles of learning (10).

Flourishing with concentration, attention, and dedication to schoolwork is among the main properties of academic engagement. Students who find a goal to do their schoolwork experience higher levels of flourishing and dedicate higher levels of concentration and attention to their schoolwork (25). In addition, they are more passionate about pursuing their studies, as a result of which they have higher levels of hope regarding graduation and findings appropriate jobs. Flourishing can be placed at the same level as humans' high stages of needs, such as self-actualization (26). Following Mascaro's study, self-flourishing and self-actualization can be reached through education. Individuals with a higher level of flourishing manifested a higher level of academic participation and achievement. Moreover, individuals with good academic status reported higher levels of flourishing (27). Students with higher levels of flourishing find meaning and goal in their schoolwork, devote their attention to carrying out their schoolwork, show more dedication to the requests of the instructor in the classroom and in fulfilling their schoolwork, pursue the request with higher levels of motivation, and direct their creativity toward a suitable path. They are more passionate about pursuing their studies, and are more concerned with graduation

and finding an appropriate job (28).

In the systems of education, the academic achievement of students is one of the indicators of success in scientific activities. Studies have demonstrated that the case of students are more engaged with academic issues and learning schoolwork, and they are more likely to be successful (9, 10). However, it should be taken into account that the variables affecting the academic engagement of students are crucially important. Academic hope is among the most important structures in this regard. Being hopeful regarding the academic and occupational future is associated with higher optimism and higher levels of academic engagement. Emotional experiences, such as academic hope in the academic environment, result in an enrichment of the treasury of thought-action along with the increase in the use of cognitive-adaptive strategies and approach behaviors; accordingly, all these factors together contribute to higher engagement in the academic fields (25). Thus, academic hope is defined as the academic engagement facilitator. It accelerates individuals' actions in regard to learning schoolwork, boosts involvement and enthusiasm of the learner to carry out their schoolwork (energy), and elevates the feeling of dedication and pleasure when doing the schoolwork (absorption). In general, hope-related emotions in individuals are affected by cognitive and personal evaluations regarding the self and the academic environment. The positive evaluation and cognition of an individual regarding the academic environment result in positive emotions whereas negative evaluation leads to negative emotions. These emotions affect the academic engagement of learners.

This finding signifies that academic engagement is defined as the interaction between attention and dedication. Students involved in their studies enjoy higher levels of attention and dedication since they place a higher value on carrying out their schoolwork and subject-related activities. The tolerance of ambiguity in students has a crucial impact on their academic hope and resilience. Consequently, this factor affects academic engagement. Students who perceived internal value, enjoy higher levels of cognitive engagement, as well as higher levels of motivation and academic achievement. Those with higher levels of academic flourishing, develop their self-regulation, enjoy higher levels of hope when faced with academic problems, manage their learning better, and tolerate social obstacles and pressures. Academic flourishing directly guides individuals toward more positive attitudes when facing academic problems and enables them to have higher levels of academic hope. Thus, the association between academic flourishing and academic hope can be justified. In other words, students who enjoy higher levels of flourishing, possess higher levels of emotional well-being, conduct positive evaluations regarding the events that take place around them, enjoy a higher tendency to live a purposeful life, the feeling of self-regulation and independence, higher internal control, and choose their destiny. Accordingly, all of them lead to improvement of academic hope, and especially the academic performance of these students (25). Therefore, it could be argued that academic hope plays a mediating role in the association between academic flourishing and academic engagement.

4.1. Limitations

The limitations of this study include the use of self-report tools, which might lead to social desirability bias in the participants and affect the accuracy of their report. In addition, on account of limiting the statistical population to the female senior high school student of the city of Ahvaz, generalizing the results of this study to other female and male students in other cities should be done cautiously.

5. Conclusions

Given the obtained results, the proposed model has the desired fitting. Furthermore, it is a crucial step in realizing the effective factors in the academic engagement and achievement of students. Considering the fact that the proposed conceptual model has a good fitting, it can be regarded as an innovative and new scientific finding, which is effective in preventing academic failure. The authorities involved in education are recommended to take these psychological structures into consideration when writing textbooks, designing educational programs, and teaching students. Having studied and learned about the importance of this subject, families can employ them in educating their children in order to prevent academic failure and demotivation.

Ethical Approval

The study was approved by the Ethical

Committee of Islamic Azad University-Ahvaz Branch with the code of IR.IAU.AHVAZ.REC.1399.125. Also, written informed consent was obtained from the participants.

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Conflict of Interest: None declared.

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