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Investigation of the Causal Relationship between Academic Motivation and Academic Engagement with the Mediating Role of Achievement Emotions and Academic Hardiness in Students

Simin Zeqeibi Ghannad, PhD
Department of Educational Psychology
Shahid Chamran University of Ahvaz
siminghannad1366@gmail.com

Sirus Alipoor Birgani, PHD*
Department of Educational Psychology
Shahid Chamran University of Ahvaz

Manijeh Shehni Yailagh, PHD
Department of Educational Psychology
Shahid Chamran University of Ahvaz

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The aim of this study was to test the causal relationship between academic motivation and academic engagement with mediating role of achievement emotions and academic hardiness. 280 first year female high school students of Dezful city were selected by multiple stage random sampling. The instruments used in this study was the Revised Academic Hardiness Scale (2005), Tinio's Academic Engagement Scale (2009), Academic Motivation Scale (1989) and Pekrun'**s** Achievement Emotion Questionnaire (2002). The current study plan was descriptive-correlative and the fitness of the proposed model was examined through structural equation modeling. The indirect effects were tested by using bootstrap procedure. The findings indicated that model fitted the data and all the direct paths were significant except external motivation to negative emotions. Also, all the indirect paths were significant.

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Keywords: academic engagement, academic motivation, achievement emotions, academic hardiness

We are witnessing the great number of students leaving school annually. This great number shows that many students feel tired and exhausted or have been unable to establish the necessary emotional relationship with their school. Chapman (2003) has used academic engagement as a phrase to define students' tendency to take part in daily school activities, participate in the classroom, do class assignments and follow teachers' directions in the classroom. Academic engagement is affected by several factors. For example, we can study academic motivation as an effective factor influencing academic engagement. Pintrich and Zusho (2002) believes that academic motivation includes intrinsic processes which motivate and sustain activity to achieve special academic objectives. Deci and Ryan (2000) maintain that academic motivation consists of three general 'intrinsic motivation', 'extrinsic motivation' and 'amotivation'. Students who are intrinsically motivated tend to act and perform better and succeed in attaining internal satisfaction for learning. On the contrary, those who are extrinsically motivated try to get their desired score or any external reward like money and prize. Those who lack any motivation get neither internal nor external motivations for their activities and thus avoid doing any activity (Deci and Ryan, 2000). The literature review shows that learning motivation affects learning emotion. Pekrun et al. (2002, 2006, 2007) and Schutz, Davis & Schwanenflugel (2002) have reported that people's control and value appraisals are critical determinants of their academic emotions. Deci and Ryan (1985) and Vallerand,

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Fortier, and Guay (1997) reviewed previous studies and found that intrinsic motivation and positive emotion are correlated. Ryan and Connell (1989) proposed that intrinsic motivation and enjoyment are highly correlated. Moreover, Patrick, Skinner, and Connell (1993) asserted that intrinsic motivation correlated positively with positive emotion and negatively with negative emotion. In a study on the self-regulation of academic emotions, Pekrun et al. (2002) reported that high achievement expectations, heavy achievement pressure, intense class competition, ineffective feedback, and the enforcement of a penalty system were highly correlated with achievement anxiety. Jarvenoja & Jarvela (2005) interviewed 18 high school students regarding their learning processes and observed a correlation between emotion and learning motivation. The findings of that study indicated that the students' emotions were generated in response to the self, work expectations, commitments, work content, and their social environment. Academic emotions including learning emotion, like other more general emotions, can be defined as temporary events in special situations and at special times (Pekrun, 2006). Control-Value Theory of Achievement Emotions gives a practical framework related to the areas of achievement. The theory assumes that the learning environment influences two cognitive validating elements including subjective control and subjective value which are basic to achievement emotions (Dettmers et al, 2011). Motivation affects both elements: value and control. Students intrinsically motivated valorize academic tasks more than students who are externally motivated (ie. for score or class ranking) and feel more control over their educational outcomes.

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On the other hand, since students spend most of their time at school, this area can involve many academic challenges and can have many stress sources (Kamtsios & Karagiannopoulou, 2012). Introducing academic hardiness, Kobasa's theory (1979, quoted in Lopez, Mecham, Shipon, Feldman and Benishek, 2005) shows that three cognitive processes (control, commitment, and challenge) are related to resistance, and perseverance when one faces difficulties in life.

Existing studies confirm the relationships between the mentioned variables and academic engagement. Assor, Kaplan, Kanat-Maymon and Roth (2005) studied students' understanding of control in their teachers' behavior as a predictor of motivation and weak academic engagement with the mediation of anger and anxiety. They showed that children's perceptions of teachers' direct controlling causes anger and anxiety (negative emotions) in them. They increase negative emotions of 'amotivation' and extrinsic motivation and decrease academic engagement in them. Also, Kahu, Stephens, Leach & Zepke (2015) suggested that different emotions have different links to engagement: as important elements in emotional engagement, as inhibitors of engagement and as outcomes that reciprocally influence engagement. Furthermore, it directly affects the superficial interaction between extrinsic motivation and studying and indirectly through the coping strategy of avoidance. Tulis and Fulmer (2013) studied the relationship between motivational and emotional experiences (boredom, anger, anxiety, and enjoyment) on one hand, with perseverance (as long term resistance in one's own program, involvement in self-regulation learning, overcoming difficulties and challenges in different educational levels, Parker, 2003) and

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engagement, on the other hand, while students experience the challenge of learning mathematics and reading. Boredom as a negative inactive emotion, reduces perseverance. In general, based on the previously mentioned studies, this researcher intends to answer the question whether the causal motivation model of academic education concerning academic engagement, mediation of academic hardiness, and achievement emotions fits the data or not. In this model, academic motivation (intrinsic motivation, extrinsic motivation, and amotivation) precedes academic hardiness and academic achievement (positive and negative emotions). As a result, academic hardiness and achievement emotions affect academic engagement. The model can be presented as follows. (See Figure 1).

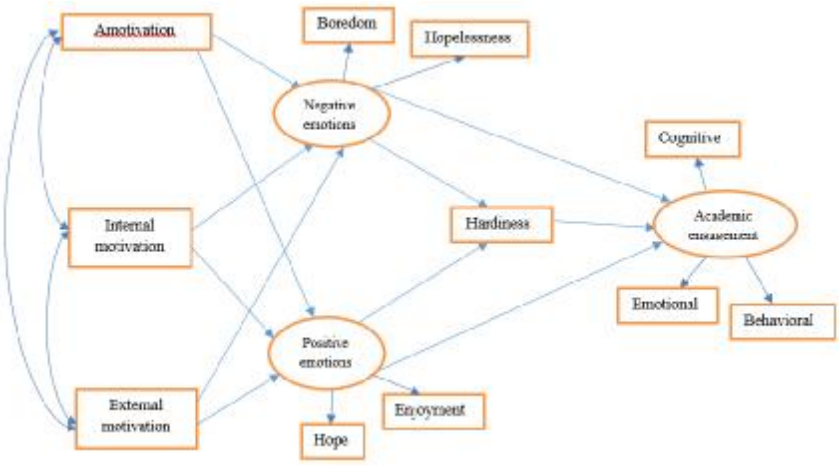


Figure 1. The Proposed Model of a Causal Relationship between Academic Motivation and Academic Engagement with the Mediating Role of Achievement Emotions and Academic Hardiness

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Method

Study Plan

The present study is a correlational non-experimental research. In studies of which the objective is testing relationships among variables, the 'Structural Equation Model Analysis' is used.

Population and Statistical Sample

The statistical sample of this study includes all the first-grade girl students in Dezful high schools in the academic year 1392-1393. The sampling procedure was a multistage random sampling in which initially, 7 high schools were chosen from all high schools in Dezful and then 20 first-grade classes were taken from these 7 high schools. Later, 12 classes were picked from those 20 classes and eventually 28 students were randomly selected from among those classes to respond to the questionnaires and to take the model test.

Instruments

In this study, four instruments were used to measure the variables.

Pekrun's Achievement Emotion Questionnaire (PAEQ)

Pekrun, Gotez, Titz and Perry (2002) designed the questionnaire of academic emotions. This questionnaire consists of 3 sections of class emotions, learning, and testing. Each of these 3 sections includes 75 items. In this study, the section of learning emotions and 4 subscales of enjoyment, hope, hopelessness and boredom were used. Respondents to this questionnaire answered the items based on a 5-degree Likert scale from 1 for complete disagreement to 5 complete

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agreement. Pekrun et al (2002) investigated the content validity of this questionnaire by asking opinions of some experts and professors in education and psychology. In this study, the validity of the scale was tested using confirmatory factor analysis. Results showed that the factorial load for all the items was sufficient (above .30). Also, in this study the Cronbach's alpha coefficients for hope, enjoyment, hopelessness and boredom were .87, .89, .92 and .93.

Academic Motivation Scale (AMS)

Academic Motivation Scale was designed and validated by Vallerand, Blais, Briere, and Pelletier in 1989. The scale of academic motivation consists of 28 questions and 3 subscales of intrinsic motivation, extrinsic motivation, and amotivation. The subjects reported their agreement or disagreement with each subject on a 7-degree Likert continuum from 1 for complete disagreement to 7 for complete agreement. Vallerand and colleagues (1992), used confirmatory factor analysis in order to validate and confirm the 3-element structure of the mentioned scale. They obtained the coefficients of Cronbach's alpha from .79 to .86 for intrinsic motivation, from .62 to .83 for extrinsic motivation, and from .83 to .85 for amotivation. In this study, the validity of the scale was tested using confirmatory factor analysis. Results showed that the factorial load for all except two items (7 and 11) was sufficient (above .30). Also, in this study the Cronbach alpha coefficients for internal motivation, external motivation and amotivation were .72, .86 and .74.

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Tinio's Academic Engagement Scale (TAES)

Tinio (2009) designed the scale to measure academic engagement and its dimensions (behavioral, cognitive, and emotional). The questionnaire contains 102 questions and it includes 3 behavioral, cognitive, and emotional subscales. Respondents give their responses based on a 5-degree Likert continuum of always (5) to never (1). The results of confirmatory factor analysis by Tinio (2009) confirmed the existence of three behavioral, cognitive, and emotional factors. Tinio also calculated the coefficients of Cronbach's alpha for the general scale, behavioral, cognitive, and emotional subscales .89, .79, .74, and .68 respectively. In this study, the validity of the scale was tested using confirmatory factor analysis. Results showed that factorial load for all items was sufficient (above .30). Also, in this study Cronbach's alpha coefficients for behavioral, emotional and cognitive engagement were .90, .91 and .91.

Revised Academic Hardiness Scale (RAHS)

Benishek et al (2005) modified the defects of the primary academic hardiness (2002) and designed their Revised Academic Hardiness Scale (RAHS). This scale consists of 40 questions and 3 subscales (commitment, effort/affect control, and academic challenging). Respondents report their responses about correctness or incorrectness of each item based on a 4-degree Likert continuum of 1 for completely correct to 4 for completely incorrect. In order to validate their scale, Benishek and colleagues (2005) reported the reliability of the academic hardiness scale as acceptable through the internal consistency method and by calculating the Cronbach's alpha coefficients for

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the dimensions of commitment, effort/affect control, challenging and the general scale as .91, .81, .88, and .90, respectively. In this study, the validity of the scale was tested using confirmatory factor analysis. Results showed that the factorial load for all except seven items (15, 16, 30, 32, 35, 37 and 39) was sufficient (above .30). Also, in this study Cronbach's alpha coefficients for commitment, effort/affect control, challenging and general scale were .79, .67, .71 and .88.

Results

Model fit

As seen in table 3, although the proposed model fits well with GFI, IFI, CFI, the other indices like RMSEA require the model to be improved. After eliminating a non-significant path of the model, the changes resulted in the proposed model that is seen in Table 3.

Table 3

Fitting of the Proposed Model and the Final Model with the Data based on Fitting Indices

Model Indices	RMSEA	CFI	IFI	AGFI	GFI	x^2/df	df	x^2
Proposed Model	.08	.97	.97	.90	.95	2.76	34	93.90
Corrected Model	.07	.97	.97	.90	.95	2.69	35	94.31

Figure 2 is the fitting correlated model of academic motivation with academic engagement, mediation of academic

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hardiness, and achievement emotions. The numbers have been standardized on paths and parameters. According to Figure 2, direct paths are significant at the .05 level except the external motivation to negative emotions. From the existing variables in this model, positive emotions haves the most direct effect on academic engagement (alpha = .73).

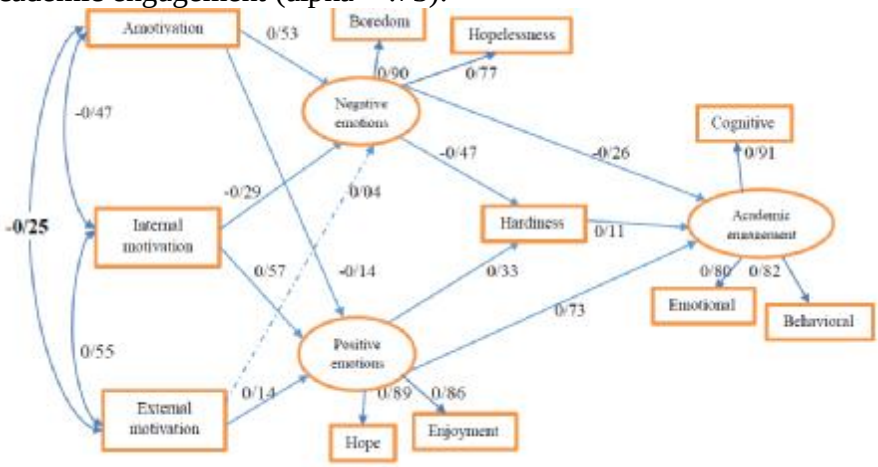


Figure 2. The Fitting Model of a Causal Relationship between Academic Motivation and Academic Engagement with the Mediating Role of Achievement Emotions and Academic Hardiness.

Direct Paths

Direct hypothesis of this study using standardized coefficients values of proposed model paths are examined. Standardized coefficients of proposed model in Table 4 have been reported.

Table 4 shows that except external motivation to negative emotions, all of the direct hypotheses have been confirmed because of their significant standardized coefficients.

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Table 4

Standardized Coefficients of Proposed Model

Direct paths	Proposed model	
	p	β
Amotivation to positive emotions	.01	-.14
Amotivation to negative emotions	.00	.53
External motivation to negative emotions	.52	.04
Internal motivation to positive emotions	.00	.57
External motivation to positive emotions	.01	.14
Internal motivation to negative emotions	.00	-.29
Positive emotions to hardiness	.00	.33
Negative emotions to hardiness	.00	-.47
Hardiness to academic engagement	.03	.11
Positive emotions to academic engagement	.00	.73
Negative emotions to academic engagement	.00	-.26

Indirect Paths

The Bootstrap method was used to determine the significance of mediation relationships. Table 5 shows the results of using the Bootstrap method in relation to mediator indirect paths. The certainty level for these certainty distances is 95, and the number of repeated samplings of Bootstrap is 1000.

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Table 5
The Results of Bootstrap for the Indirect Path of the Model

Indirect paths	Data	Boot	Bias	SE	Confidence Interval	
Positive emotions to academic engagement by mediating academic hardiness	.81	.81	.009	.18	.46	1.16
negative emotions to academic engagement by mediating academic hardiness	-.46	-.46	-.002	.087	-.27	-.62
Internal motivation to academic hardiness by mediating positive emotion	.35	.35	.004	.08	.20	.52
External motivation to academic hardiness by mediating positive emotions	.47	.47	.01	.09	.30	.66
Amotivation to academic hardiness by mediating Positive emotion	-.43	-.43	-.002	.085	-.61	-.27
Internal motivation to academic hardiness by mediating negative emotions	.32	.32	-.002	-.06	.22	.47
Amotivation to academic hardiness by mediating negative emotion	-.73	-.74	-.01	.13	-1.01	-.50
Internal motivation to academic engagement by mediating negative emotion, positive emotion and academic hardiness	2.64	2.65	.007	.27	2.12	3.18
External motivation to academic engagement by mediating role of negative emotions, positive emotions and academic hardiness	2.68	2.69	.02	.35	2.09	3.47
Amotivation to academic engagement by mediating negative emotions, positive emotions and academic hardiness	-3.89	-3.93	.042	.56	-5.03	-2.82

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As seen in the table 5, the certainty distances reveal the exclusion of zero in these distances, and the significance of general indirect paths (through two mediaors) and paths with one mediator. The certainty levels which do not include zero indicate that the desired indirect effect is significant. As seen in table 5, all of the indirect paths are significant.

Discussion

This study aimed at determining the causal relationship between academic motivation and academic engagement with the mediating role of achievement emotions and academic hardiness in high school female students of Dezful city. The results show that the proposed and corrected models in this study fit well with the data. Also, the findings indicate that intrinsic motivation and extrinsic motivation affect academic hardiness through negative emotion and positive emotions. Also, amotivation affects academic hardiness through positive emotions and negative emotions. In sum, intrinsic motivation had greater correlation with academic emotions than extrinsic emotions. Since students who are motivated intrinsically consider challenge a chance for mastering a difficult task, they are more likely to show tolerance and resistance, while extrinsic rewards decreases self-determination when students do their academic assignments. Then, a student assumes the consequences of facing academic challenges to be irrelevant to his/her personal growth and tends to face challenges less. Weiner (2000) believes that thoughts which emerge accompany emotions and determine the direction of human behavior. Thus, considering consequent outputs of assignments as controllable or uncontrollable leads to greater student adaptation to and

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his/her resistance against hard and stressful academic situations. Hardiness prepares a student for receiving and confronting academic challenges and therefore involvement in educational activities. The present study showed that academic emotions significantly correlate with academic engagement through academic hardiness. Lazarus (1991, quoted by Hassanzadeh, 2008) has pointed out positive emotions as coordinated with the aim of facilitating achievement to the personal goals. On the base of the Pekrun (2006) model, the effect of emotion on learning and achievement can be achieved by a number of cognitive and motivational mediators, including learning motivation, learning strategies and self-regulation. Also, based on the control-value theory of achievement emotions this expectation that success is achievable and failure is preventable, causes to perceive the adequate internal controls on activities and outputs progress. If the activity is valuable, but made no considerable control on it and cannot be successfully picked up barriers to activity, the frustration occurs. Also, if the requirements of an assignment are low, as it is uniform in daily tasks, due to insufficient challenge and the lack of intrinsic motivation, fatigue is caused.

The results of the current study showed that amotivation and academic engagement are correlated significantly through academic hardiness. According to Kobasa (1979, quoted in Delahaij, Gaillard, & Dam, 2010) hard individuals act differently in difficult situations: first, they see difficult and stressful situations as controllable and less threatening; second, they face such situations more actively and tend to apply confrontational strategies in order to turn stressful situations into balanced and mild ones (Maddi, 2002). The present study

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showed that extrinsic motivation significantly correlate with academic engagement through academic hardiness. In this study, by extrinsic motivation, regarding practical matters, the researcher means a tendency to obtain an income and a better job as long-term objectives of education. These external, materialistic and expected rewards divert the individual's attention from learning to getting rewards, hinders creation of independent self- autonomy and quality of learning, and endangers the flexibility of the learner in his/her way of thinking and problem solving. (Reeve, 2009). This situation leads to the reduction of learner's commitment and hardiness so that the externally motivated learner stops acting as soon as he/she achieves the necessary level to get his/her rewards. The results of the present study showed that intrinsic motivation significantly correlates with academic engagement through academic hardiness. Bandura (1997, Carr, 1975) has indicated that according to self-determining theory proposed by Deci and Rayan, students develop intrinsic motivation in themselves in order to achieve assignments which are challenging and feel they can do well, and are satisfying for them. On the other hand, rewards are meant to increase intrinsic motivation, for example, lingual rewards, should bear low controllability. They should also be informative. Thus, intrinsic motivation with the prediction of control, valuation, and pleasure of performing a task which makes it challenging increases hardiness and probability of academic engagement.

This study faces limitations for generalizing its results. Proving causal relationships among variables should be done cautiously because of using the structural equations method. The subjects of the present study were first-grade girl students of

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High schools in Dezful city; then, one should be cautious of generalizing the results to boy students and other populations and educational levels. Another limitation of the study relates to the fact that using a single method for a research can be biased. Using self-reporting questionnaires, respondents' dishonesty, their carelessness, and slackness in responding to the questionnaires in spite of the researcher's monitoring and encouraging procedures to do the research reduces the constructive validity of the study.

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