**IPA**
International Journal of Psychology
Vol. 15, No. 2, Summer & Fall 2021
PP. 177-207

**I**ranian **P**sychological
**As**sociation

# Predicting Motivation and Academic Performance based on Expectation-Value Theory by the Mediating Role of Benefit, Situational Cost and Psychological Cost

***Article Type:*** *Research Article*

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Received: 12/ 3/ 2023 Revised: 20/5/ 2023 Accepted: 31/ 5/ 2023

Doi: 20.1001.1.20081251.2021.15.2.6.7

Relying on expectation-value theory as a guide, the study was focused on both the direct effects and mediating roles of benefit, and psychological and situational costs on academic motivation and academic performance. This study was conducted with the aim of predicting motivation and academic performance based on expectation-value theory by the mediating role of benefit, and situational and psychological costs. The research method was descriptive-correlational. The statistical population of this study included all students of Bu-Ali Sina University of Hamadan city-Iran. 395 students were selected from the faculties of Economics and Social Sciences, Basic Sciences, Engineering, Literature, Agriculture, and Art as the research sample using available sampling method. The instruments were Academic Motivation Scale (Rashid & Delfan Beiranvand, 2019) and the Expectation-Value-Cost-



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[ DOI: 10.66224/ijpb.15.2.177 ]

Benefit Scale (Rashid & Delfan Beiranvand, 2023). The mean of the students' academic performances- grade point average or GPA -in their past semesters was considered the criterion for their academic performance. The data were analyzed by path analysis with $SPSS_{25}$ and LISREL software. The results indicated that the proposed model fitted the experimental data. In addition, the results of path analysis showed that the effects of expectation on motivation (β= .19, p< .01) and academic performance (β= .15, p< .05) were significant. The effects of value on motivation (β= .20, p< .01) and academic performance (β= .13, p< .05) were significant. The effect of benefit on motivation (β= .17, p< .01) was significant, while the effect of benefit on academic performance (β= .04, p> .05) was not significant. The effect of situational cost on motivation (β= -.05, p> .05) was not significant, but this effect was significant on academic performance (β= -.16, p< .05). The effects of psychological cost on motivation (β= -.22, p< .01) and academic performance (β= -.23, p< .01) were significant. Indirect hypothesis using Bootstrap test were tested. Therefore, there are important and new implications concerning the role of benefit and cost as well as expectation and value in motivation and academic performance of Iranian students.

***Keywords**:* academic motivation, expectation-value theory, psychological cost and situational cost, benefit, academic performance

Academic performance as a structure still under discussion (Martínez, Karanik, Giovannini & Pinto, 2015), is a factor which affects the future of the students (Kapur, 2018), and motivation is a process by which goal-oriented activities are evoked and maintained (Schunk, Pintrich & Meece, 2020). The factors which affect academic achievement are plentiful. To name a few, students' attitudes, school's facilities, management and leadership (e.g., principal, teachers and staff), teachers' skills and abilities (Maina, 2010), classroom climate, parental role, social environment, psychological and health factors, visual and auditory disorders (Srinivas, Venkat & Krishnan, 2016), counseling and guidance facilities (Maganga, 2016), study skills, time management, home climate, teaching and learning methods,



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teachers' accessibility and professionality (Kapur, 2018), and academic motivation are all of consequence. Academic motivation is a psychological construct that affects a range of access points to personal academic goals through different types of academic activities, which in turn influence activities related to academic achievement (Bruinsma, 2004). Behaviors which demonstrate academic motivation include insisting on doing difficult tasks, persistence and striving to master learning, and choosing demanding tasks (Schunk, Pintrich & Meece, 2020).

Overall, motivation plays an important role in academic achievement (Lemos & Verissimo, 2014), and is one of the main indicators of the quality of education in universities (Lawrence, 2014). Lemos and Verissimo (2013) showed that there is a positive correlation between intrinsic motivation and academic achievement. Minnaert, Prince and Opdenakker (2017) showed that learning motivation is inseparable from academic achievement, and academic performance is related to motivation (Sikhwari, 2014; UlstadHalvari, Sorebo & Deci, 2016). Motivation drives an individual and increases the desire, affects the direction, and maintains goal-oriented behaviors (Basu & Bano, 2016). Two types of motivation are extrinsic and intrinsic. Beginning an action based on desire and pleasure can be considered the result of intrinsic motivation (Waqar, Shafiq & Hasan, 2016). In fact, intrinsic motivation is the highest level of self-determination as it refers to an individual's attempt to achieve his main goal, satisfaction with that action, and the resulting pleasure (Basu & Bano, 2016). Intrinsic motivation is described as the behavior which people do eagerly and without the need for material rewards (Ryan & Deci, 2000). Intrinsic motivation can also be defined as the desire and the will of an individual to perform an action or to participate in a certain task because of enjoyment or the improvement of his abilities and



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skills (Yun, 2019). In addition, the source of motivation of such behaviors is within the individuals (rather than external rewards) where individuals engage in certain behaviors as an opportunity to explore, learn, and make use of one's capacity (Nairne, 2014; cited in Jan, 2019). For instance, a student likes a psychology course because of his interest and the pleasure which he gets from the content of the course (Kapur, 2018). According to Niemiec, Ryan and Deci (2010), when people consider themselves competent and autonomous, they tend to have intrinsic motivation. Sometimes, a lesson is so interesting for the students that they try their best to learn. For these students, learning is based on intrinsic motivation. Unlike intrinsic motivation, extrinsic motivation occurs when people perform an action because of its positive consequences (Waqar, Shafiq & Hasan, 2016). Extrinsic motivation is based on external factors such as rewards, obligations, approval and praise (Coon & Mitterer, 2013). Extrinsic motivation is a multidimensional structure which includes four aspects of integrated regulation, identified regulation, introjection regulation, and external regulation (Utvaer & Haugan, 2016). Integrated regulation includes the behaviors which are integrated with one's life, and are part of one's value system (Vora & Naik, 2016). In identified regulation, one believes that the consequences of behaviors are individually considerable, although one may not appreciate his activity. Introjection regulation refers to the behaviors which have been adopted by the individual, but are not part of his value system because they may be based on external factors.

Finally, external regulation refers to the behaviors which are determined by external bases such as rewards (Vora & Naik, 2016). Various theoretical models of motivation, as the



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underlying cause of one's behavior (Lai, 2011) have been proposed. From among those, expectation-value model (Eccles et al., 1983) provides a comprehensive framework for understanding students' motivation (cited in Brophy, 2010), and as various studies have shown, it is a beneficial model to understanding students' learning and performance (Hulleman, Barron, Kosovich & Lazowski, 2016). As the name implies, expectation-value models focus on the importance of two components in raising overall motivation: the hope of success in a task (expectation), and the value of a task (Baron & Holman, 2014). The structure of expectation shows beliefs and judgments about an individual's ability to do a task and succeed. Value indicates the purpose of completing a learning task (Schunk, Pintrich & Meece, 2020). The expectation-value theory (Wigfield, Guthrie, Tonks & Perencevich, 2004) is an extension of Atkinson's concept of achievement motivation and is one of the cognitive-social models which accounts for students' expectations for, and value of, academic achievement. The model advocates that motivation consists of two basic factors which predict important educational outcomes: expectation and value (cited in Wong, 2008). Eccles et al. (1995) surmised that expectation and value are separate factors with various dimensions. In another form of expectation-value theory, the role of cost in motivation was considered, and some more detailed work done in this regard. For instance, Eccles et al. (1983) addressed three dimensions of cost as the amount of effort required to perform the desired task, the loss of the chance to engage in other valuable activities, and the negative psychological states resulting from the failure in the desired task. According to Baron and Holman (2014), cost consists of four sub-components of effort related to the task, (i.e., the amount of effort required to do a task), effort unrelated to the task, (i.e., the amount



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of effort spent on other tasks; Flake, 2012), loss of valued alternatives, and negative psychological experiences. So, to make sure if a student is motivated, the following question should be posed: Can he pass the obstacles which prevented him from investing time, energy, and resources in doing the assignments? For instance, a student may confidently endorse the ability to complete an assignment which she considers valuable but she is still unmotivated because her answer to the question is "no"; there are obstacles which prevent her from getting involved with the task at hand (i.e., costs).

Expectation is related to the successful consequences (e.g., grades), and indicates the extent to which a student believes in his ability to succeed in doing an assignment. That is, motivational beliefs that determine the expectancy beliefs and the mental value of the task, and thereby affect achievement (Kosovich, Hulleman, Barron & Getty, 2014). The expectation structure reflects a person's beliefs and expectations about his abilities to act and succeed, and includes two dimensions: ability beliefs (i.e., what students think they can do now), and expectancy beliefs (i.e., what students think they can do in the future; Eccles et al., 1983). Value is the other factor related to academic outcomes, and reflects the amount of value a student allocates to a task (Wigfield & Cambria, 2010). Value is one of the various explanations that students provide for an action (Lipnevich, Preckel & Roberts, 2016). Dimensions of value include intrinsic value (i.e., engaging in an activity because of enjoyment), practical or utility value (i.e., engaging in an activity to achieve other short-term or long-term goals), and attainment value (i.e., engaging in an activity because it confirms an important aspect of a student's identity; Kosovich, Hulleman, Barron & Getty, 2014). Cost reflects the



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negative aspects of engaging in an activity (e.g., examining the effort and the time required to succeed, losing the opportunity to participate in other valuable activities, and being in negative psychological states such as struggling or failing to do an activity (Kells, Wigfield, 2020). Flake, Barron, Hulleman, McCoach and Welsh (2015) showed a four-factor structure for the task cost scale, which includes task effort cost, loss of valued alternatives, emotional cost, and outside effort cost. Previous research studies have shown that expectation and value (excluding cost) are positively correlated with each other as well as with educational outcomes such as students' success and perseverance (Durik, Vida & Eccles, 2006). Cost is negatively related to expectation, value, and learning outcomes (Kosovich, Hulleman, Barron & Getty, 2014). Eccles considered cost as a dimension of value (Parsons, 1980); however, recent models of expectation-value emphasize the importance of distinguishing value from cost. Recent research suggests that cost is a separate factor, and is negatively related to expectation and value (Grays, 2013). Kosovich, Hulleman, Barron & Getty (2014) showed that cost separately (along with expectation and value) can affect motivation; they showed two positive motivational factors (i.e., expectation and value) and cost. Rashid, Yaqubi and Karimi (2016) also validated the expectation-value-cost scale in Iran and confirmed these separate three factors. Thus, the objective of the present study was to analyze motivation and academic performance using expectation-value theory with the mediation of benefit, situational and psychological costs. In this vein, we set out to examine the degree to which academic motivation and academic performance are influenced by the mediating roles of benefit, psychological cost and situational cost based on expectation-value.



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## Method

The method of this research was descriptive- correlational. The statistical population included all students of Bu-Ali Sina University. Since the structural equation modeling methodology is very similar to some aspects of multivariate regression, one can use the sample size determination principles in multivariate regression analysis to determine the sample size in structural equation modeling. In multivariate regression analysis, the sample number (observations) ratio to independent variables should not be less than 5. Otherwise, the regression equation results will not be very generalizable (Toda and Yamamoto, 1995). A more conservative ratio of 10 observations per independent variable has been suggested by Halinsky, Floret, Miller, and Kans. According to James Stevens and Klein (Kline, 2015), considering 15 observations for each predictor variable in the multiple regression analysis with the standard minimum square method is a good rule of thumb. It is also always emphasized that the minimum sample should not be less than 200 people (Hooman, 2005). According to the above explanations, 395 students were selected from the faculties of Economics and Social Sciences, Basic Sciences, Engineering, Literature, Agriculture, and Art as the research sample using available sampling method. 360 (91.1%) of the sample were females and 35 (8.9%) were males. Due to the fact that the number of female students were more than the number of male students, the percentage of female participants was more than male participants. It should be noted that the mean of the students' academic performances in their past semesters was considered the criterion for their academic performance. The inclusion criteria



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included students studying at Bu-Ali Sina University and willingness to participate in the study. In order to analyze data, path analysis, Sobel's test, and fit indices for codified patterns such as RMSEA (Root Mean Square Error of Approximation), IFI (Incremental Fit Index), CFI (Confirmatory Factor Analysis), GFI (Goodness-of-Fit Index), TLI and X2/df fit index were used.

**Instruments**

A) Academic Motivation Scale. This 20-item scale was developed by Rashid and Delfan Beiranvand in Persian (2019). It includes three subscales of compatibility with needs, attempt to succeed, and interest in learning. The items are based on the Likert scale ranging from totally disagree (1) to totally agree (6). The reliability coefficient was tested using Cronbach's alpha ($\alpha$ = .90). In the present study, the first and the second order confirmatory factor analysis indicated that academic motivation is a three-factor structure. Furthermore, the reliability coefficients were .72, .62, .86 and .71 for the whole scale, compatibility with needs, attempt to succeed, and interest in learning, respectively.

B) Expectation-Value- Benefit-Cost Scale**.** This 32-item scale was developed by Rashid and Delfan Beiranvand in Persian (2023). It includes five subscales of expectation, value, benefit, psychological cost, and situational cost. Some of the examples of the items considering each factor are as follows: expectation (e.g., I can learn anything); value (e.g., I think learning is very valuable); benefit (e.g., those who study, will have a better life); situational costs (e.g., Doing assignments is very time consuming); and psychological costs (e.g., I am afraid of failure when I try to learn). This scale was designed based on a 6-point Likert scale ranged from strongly agree to strongly disagree. The internal consistency of this scale was obtained by Cronbach's alpha coefficient method. In the present study, Cronbach’s alpha



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coefficients for the subscale's expectation, value, benefit, situational costs, and psychological costs, alphas were .898, .899, .793, .778, and .862, respectively.

## Results

In this study, 395 people (360 females and 35 males) participated. In the meantime, 114 students from the Faculty of Basic Sciences, 45 students from the Faculty of Technical-Engineering, 66 students from the Faculty of Economic and Social Sciences, 65 students from the Faculty of Literature, 45 students from the Faculty of Agriculture, and 56 students from the Faculty of Literature were selected. The mean and standard deviation of age were 24.05, 4.82 for males and 24.08, 4.33 for females. The minimum age of the participants was 16 and the maximum age was 40. 202 participants were undergraduate, 167 participants were master, and 26 participants were PhD. The lowest overall average was 11 and the highest overall average was 20. Participants were jobless and had no income. These students reported that they received money monthly from their families.

Before analysis administration, the path analysis defaults, including the normality of data distribution, error independence, and multicollinearity, were examined. Skewness and kurtosis of the distribution of the scores were used to investigate the normality default of the research variables, which indicated that the scores distribution of all variables was normal (distribution range between +1 and -1). The Durbine and Watson's test was used to examine the error independence, which demonstrated no correlation among the errors (D. W= 1.89, the range between 1.5 and 2.5 is acceptable). The Variance Inflation Factor (VIF) and tolerance were used to examine the multicollinearity, which



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indicated no collineation among the variables (VIF range was obtained less than 5, and tolerance was obtained higher than .1) (Table 1). Pearson's correlation was used to investigate the linear relationship between the research variables. As Table 2 shows, there were significant correlations between all variables.

**Table 1**
**Mean, Standard Deviation, Skewness and Flatness**

| Variables | M | S.D. | Skewness | Kurtosis | VIF | Tolerance |
|---|---|---|---|---|---|---|
| Expectation | 37.99 | 6.60 | -.95 | .69 | .59 | 1.67 |
| Value | 34.32 | 5.84 | -.87 | .34 | .47 | 2.12 |
| Psychological Cost | 29.38 | 8.73 | -.28 | -.46 | .56 | 1.70 |
| Benefit | 21.43 | 5.01 | -.43 | -.10 | .63 | 1.58 |
| Situational Cost | 15.02 | 4.29 | -.24 | -.40 | .60 | 1.64 |
| Academic Motivation | 82.63 | 10.71 | -.05 | .25 | - | - |
| Academic performance | 15.48 | 1.91 | -.37 | -.50 | - | - |

The general fitness of the model was examined in the first step, and the regression weights of the measuring models and the coefficients of the relationships were then analyzed. In other words, path analysis was used to test the research model. In the first stage, the overall fit of the model, and then the standard coefficients of the correlations between the variables were examined: expectation and value directly and indirectly through the mediation of psychological cost, benefit, and situational cost



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affected motivation and academic performance. Figures 1 and 2 show the experimental correlation coefficients.

**Table 2**

**The Correlation Matrix of the Variables**

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Expectation | - | | | | | | |
| Value | .58** | - | | | | | |
| Psychological cost | -.41** | -.33** | - | | | | |
| Benefit | .39** | .60** | -.19** | - | | | |
| Situational cost | -.27** | -.31** | .61** | -.13* | - | | |
| Academic motivation | .36** | .41** | -.30** | .36** | -.18** | - | |
| Academic performance | .31** | .28** | -.34** | .14** | -.23** | .35** | - |

*P< .05،**P<.01

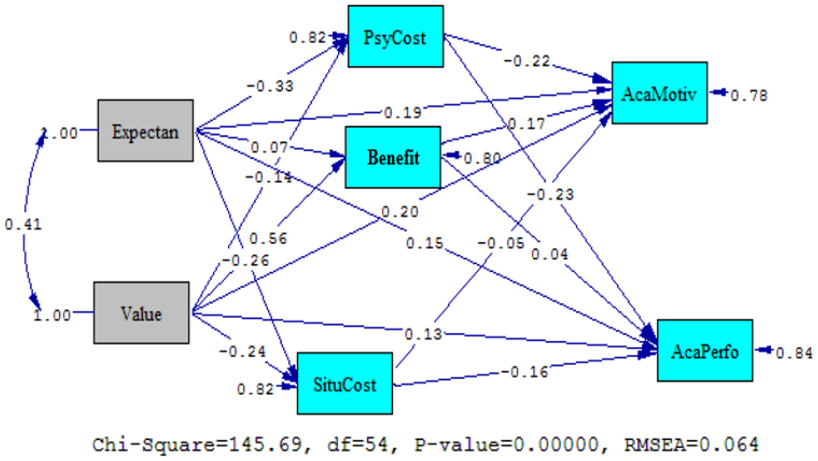



**Figure 1. The standard coefficients of the relationships between motivation, value, academic motivation, and academic performance with the mediating role of psychological cost, situational cost, and benefit at the standard mode**



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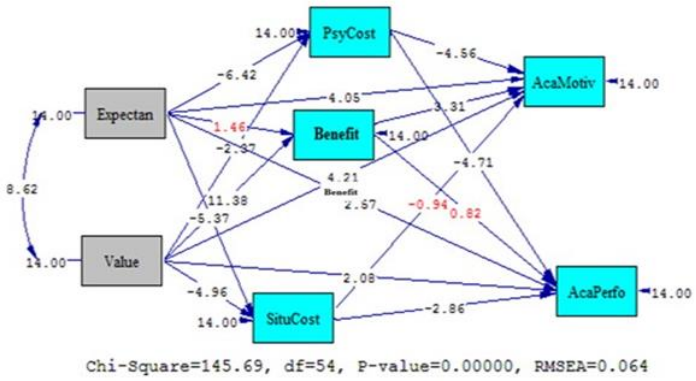



**Figure 2. The standard coefficients of the relationships between motivation, value, academic motivation, and academic performance with the mediating role of psychological cost, situational cost, and benefit at the significant mode**

The fit indices of the model were first investigated in order to determine the general fitness of the model. Table 3 displays the fit indices. Model fit was in the acceptable range ($\chi^2$= 145.69 (54), CFI = .94, RMSEA = .069). For $X^2/df$ fit index, the values less than 5 are appropriate, and the closer the value is to zero, the better the model would fit. Considering GFI, IFI and CFI, a value close to .90 and above is considered an acceptable fit, indicating fitness of the model. With regard to RMSEA index, values close to .05 or less indicate a good fitness of the model, and the value of .08 or less indicates a reasonable error; a value higher than .10 indicates the need to reject the model (Hooman, 2005). The fit indices presented in Table 3 indicate the goodness of fit of the model. Thus, it can be stated that the proposed model fit the experimental data. In the next step, all impacts of all various paths were investigated, as shown in Table 4.



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**Table 3**

**Fit Indices for the Developed Model**

| Fitness indices | $X^2$ | df | $X^2$/df | GFI | IFI | CFI | RMSEA |
|---|---|---|---|---|---|---|---|
| **Model** | 145.69 | 54 | 2.69 | .92 | .95 | .94 | .069 |
| **Accepted range** | - | - | $X^2$/df <5 | GFI > .90 | IFI > .90 | .90، CFI > | RMSEA<.08 |

In the following parts, the effects related to all the direct paths in the model are considered, and the standard coefficients of the paths along with their level of significance are presented in Table 4.

**Table 4**

**Coefficients of the Model Predicting Motivation and Academic Performance Based on Expectation and Value with the Mediating Role of Psychological Cost, Benefit, and Situational Cost**

| Direct path | Regression coefficient | t-statistics |
|---|---|---|
| The effect of expectation on academic motivation | .19 | 4.06 |
| The effect of expectation on academic performance | .15 | 2.57 |
| The effect of value on academic motivation | .20 | 4.21 |
| The effect of value on academic performance | .13 | 2.08 |
| The effect of expectation on | -.33 | -6.42 |



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| | | |
|---|---|---|
| psychological cost | | |
| The effect of expectation on benefit | .07 | 1.46 |
| The effect of expectation on situational cost | -.26 | -5.37 |
| The effect of value on psychological cost | -.14 | -2.37 |
| The effect of value on benefit | .56 | 11.38 |
| The effect of value on situational cost | -.24 | -4.96 |
| The effect of psychological cost on academic motivation | -.22 | -4.56 |
| The effect of psychological cost on academic performance | -.23 | -4.71 |
| The effect of benefit on academic motivation | .17 | 3.31 |
| The effect of benefit on academic performance | .04 | .82 |
| The effect of situational cost on academic motivation | -.05 | -.94 |
| The effect of situational cost on academic performance | -.16 | -2.86 |

The analysis of the data regarding the relationships between the variables (The standard coefficients of the model) obtained through the regression coefficients path (see Table 4) showed that the effects of expectation on academic motivation (β= .19, p< .01) and academic performance (β= .05, p< .05) were significant. The effects of value on motivation (β= .20, p <.01) and academic performance (β= .03, p< .05) were also significant. The effects of expectation on psychological cost (β= -.33, p< .01) and situational cost (β= -.26, p< .01) were significant; however, the effect of



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expectation on benefit (β= .07, p> .05) was not significant. In addition, the effects of value on psychological cost (β= -.14, p< .05), benefit (β= .06, p <.01) and situational cost (β= .24, p< .01) were significant. Furthermore, the effects of psychological cost on motivation (β= -.22, p< .01) and academic performance (β= -.23, p< .01) were significant. Moreover, the effect of benefit on motivation (β= .17, p< .01) was significant; however, the effect of benefit on academic performance (β= .04, p> .05) was not significant. Finally, the effect of situational cost on motivation (β = -.05, p> .05) was not significant; however, the effect of situational cost on academic performance (β = -.16, p< .01) was significant.

Also, the Bootstrap method was used to investigate the mediating roles of psychological cost, benefit, and situational cost in the relationship between expectation and value with motivation and academic performance (see Table 5).

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**Table 5**

**The Results of the Investigation of the Mediating Roles of Psychological Cost, Benefit and Situational Cost in the Relationship Between Value and Expectation with Motivation and Academic Using the Bootstrap Method**

| Direction | Indirect effect | P(value) | 95% Confidence interval | |
|---|---|---|---|---|
| | | | Low limit (Lower) | upper line (Upper) |
| Expectation→ Psychological cost → Academic motivation | .072 | .001 | .087 | .192 |
| Expectation→ Psychological cost→ Academic performance | .075 | .001 | .106 | .223 |
| Expectation→ Benefit →Academic motivation | .011 | .137 | -.068 | .146 |
| Expectation→ Benefit → Academic performance | .002 | .312 | -.152 | .237 |
| Expectation→ Situational cost→ Academic motivation | .013 | .089 | -.031 | .184 |
| Expectation→ Situational cost → Academic performance | .041 | .008 | .024 | .152 |
| Value→ Psychological cost→ Academic motivation | .030 | .029 | .013 | .117 |
| Value→ Psychological cost→ Academic performance | .032 | .007 | .012 | .076 |
| Value→ Benefit → Academic motivation | .095 | .001 | .128 | .386 |
| Value→ Benefit →Academic performance | .022 | .056 | -.006 | .072 |
| Value→ Situational cost→ Academic motivation | .012 | .098 | -.024 | .143 |
| Value→ Situational cost→ Academic performance | .038 | .015 | .062 | .212 |

$^{*}p<.05$, $^{**}p<.01$

In the bootstrap method, the level of confidence is 95% and the number of bootstrap resampling is 5000. If the upper limit and lower limit values (confidence intervals) do not include zero, the role of the mediating variable is significant. Based on the bootstrap results (95 confidence interval), it was determined that the indirect effect of expectation on academic motivation (β = .072, p < .01) and academic performance (β = .075, p < .01) through psychological cost, is meaningful. The indirect effect of expectation on academic motivation (β = .011, p >.05) and academic performance (β =.002, p > .05) is not significant. The indirect effect of expectation on academic motivation (β = .013, p < .05) is not significant through situational cost, but it is significant on academic performance (β = .041, p <.01) through situational cost. The indirect effect of value on academic motivation (β = .030, p < .05) and academic performance (β = .032, p < .05) is significant through psychological cost . The indirect effect of value on academic motivation (β = .095, p < 0.01) through benefit is significant, and on academic performance (β = 0.022, p < 0.05) through benefit is not significant . The indirect effect of value on academic motivation (β =.012, p < 0.05) is not significant through situational cost, but it is significant on academic performance (β = 0.038, p <0.01) through situational cost.

## Discussion

The findings of the study showed the fitness of a conceptual model elucidated academic motivation and performance phenomena based on expectation-value theory including the mediating role of benefit, and situational and psychological costs. Expectation and value had different direct and indirect (through



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the mediation of benefit, psychological cost, and situational costs) effects on academic motivation and performance. In line with the present study, Getty et al. (2013), and Lazowski et al. (2012) advocated that expectation and value were positively related together, but both were negatively related to cost. They also showed that when all three factors of expectation, value, and cost were tested in regression models and pathways, they provided unique predictive validity concerning important educational outcomes; expectation was a strong and positive predictor of performance (e.g., a test score for an academic unit or a final score in an academic class). However, it had nothing to do with interest (e.g., a constant interest in the subject or pursuing work in a field). In contrast, the construct of value was a strong predictor of interest, but it was not related to the performance. Nevertheless, cost was a negative predictor of both interest and performance. So, while based on the past research findings, motivation to learn is inseparable from academic success (Minart, Prince & Opdenker, 2017), and expectancy beliefs and task value are the two main predictors of progressive behavior (Lipnevich, Preckel & Roberts, 2016), we, as teachers and professors at the levels of schools and universities, observe a decrease in motivation and academic performance and even dropouts. On the other hand, it can be seen that many students have high expectations for various learning assignments; they show great value for learning, however, there would be a decrease in their academic performance. For that reason, it seems that some factors other than expectation and value can affect motivation and academic performance, and the findings show that the answer may be cost and benefit, which play role in this case.

Regarding the role of situational cost, psychological cost, and benefit as separate factors which can affect motivation and academic performance along with expectations and value, and the



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mediating role they play, it can be stated that these factors have important implications. Today, we encounter many students who do not make much academic progress and sometimes dropout despite high expectations and value for learning.

In fact, the cause of examining benefits and costs in this study was due to the fact that we may encounter various situations, many of which are expected to be successful and also valuable to us, but no action appears. In such cases, the weakness of the expectation-value theory becomes apparent. Relying on expectations and values and considering the gap between the two in an individual, this theory can show, to some extent, what happens that some actions are not performed by some individuals and why a group of individuals are not motivated to act. However, the theory does not fully account for the phenomenon: Among ten areas in which we expect success and all of which are valuable to us, what happens when we choose one area and put aside others? We propose that although the issue of cost has been examined in some recent studies, its role along with benefit in performance and motivation has not been taken seriously. Based on the findings of this study, in examining motivation and academic performance, we should consider cost (psychological and situational) and benefit as well as expectation and value. According to observations made in the present study, psychological cost should be considered as a factor affecting motivation and scholastic performance. In a qualitative study, Watkinson et al. (2005) examined cost. They interviewed elementary school students asking why they chose or avoided participating in different activities. When discussing the factors which prevent them from participating in activities, in addition to expectation and value, the students talked about psychological



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costs (e.g., being teased) and physical costs (e.g., being uncomfortable). However, research activities have not considered the types of costs as it is done in this research, and did not emphasize the importance of each type of cost in academic motivation and performance. By contrast, there are many psychological costs involved in spending time, energy, and effort which challenge benefits. In the psychological battle between these influences, it would be important to know which various behaviors would be performed or not. Psychological costs have important effects on motivation and performance in educational activities. Findings showed that while students may think of learning activities in school and university valuable, and feel confident in, because of the time and energy it needs to devoted, and the stressful nature of those activities, they may avoid involvement in such behaviors. So, psychological costs are a cue effective variable in motivation and academic performance.

Besides, this study highlighted the mediating role of benefit in the relationship between expectation and value with motivation, the negative mediating role of situational cost in the relationship between expectation and value with motivation, and the negative mediating role of psychological cost in the relationship between expectation with motivation and academic performance, and between values with motivation. But, why those mediated variables (psychological and situational costs, and benefit) have a significant practical effect just on motivation and not on academic performance, except psychological costs which have a meaningful effect on both? The answer is in the nature of the expectancy-value model which is a theory in motivation. In other words, the mediators of the research are more related to the value (if in positive ways as benefit or in negative ways as costs) one attach to his/her goals or desires, not on performance, which of course could be one of the results of motivation. In fact,



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motivation is the guiding factor; it deals more with the future, by directing goal-oriented behaviors and energizing them, and costs and benefit have the same nature as values but in some different ways.

Hence, in coordination with motivation which is related to goal-orientation behaviors and the future, costs and benefit are more effective with motivation than performance. Therefore, it may be that psychological costs mediate between expectation and value with motivation and academic performance, and benefit and situational costs mediate between expectation and value with motivation. Individuals can perform a task when the task's level of psychological and situational costs is low and the range of its benefits is higher than that of costs. Hence, motivation and academic performance can be examined when costs (psychological-situational), and benefits are considered along with expectation (i.e., belief in ability) and values (interest and pleasure). In sum, the research findings showed that to perceive motivation and performance (specifically in academic domain), it is important to consider not only costs and benefits, but also the types of costs and benefits. Therefore, based on the results, it can be said that paying attention to these points is important: 1- it seems that expectance-value theory needs to be refined. 2- Costs and benefit have an important role in motivation and academic performance. 3- There are more detailed aspects in cost as an educational factor. 4 - Benefit and Psycho-situational factors have a mediating role between expectancy and value on one hand and motivation and academic performance on the other hand.



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## Limitations

One of the limitations of this study is the limited sample size which included just the students of Bu-Ali Sina University. Another limitation was the low cooperation of male students to participate in the study to complete the desired scale. Also, using merely self-report instruments and implementing the study in an academic context can be considered other limitations of the present study. Another limitation of this research was that in the scale of expectation-value-benefit-situational cost and psychological cost, the types of benefit were not clear and the benefit factor was expressed in general terms. This limitation prevented it from being able to investigate the effect of psychological benefit and situational benefit on motivation and academic performance. These limitations limit the generalization of results to other age groups in different educational contexts. Therefore, researchers need to be careful in generalizing the results of this study.

## Further research

Considering that the findings of this research showed that the two factors of benefit and cost (psychological-situational) can influence the motivation and academic performance of people, it is suggested to future researchers to examine the effect of types of benefit (psychological-situational) in line with the factors of cost (psychological-situational), expectation and value on the motivation and academic performance of a larger sample of male and female students. Then, two groups of male and female students should be compared and analyzed based on which of the above factors can have the greatest effect on the motivation and academic performance of these groups.



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**Acknowledgments**

We are grateful for the constructive explanations of the respected reviewers of the article, which improved the quality of the article. We are also grateful to all the students who participated in this research.

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[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

## *References*

Amani Far, M. (2019). The mediating role of academic motivation and academic self-efficacy in the relationship between academic engagement and goal orientation in students. *Quarterly Journal of Management Studies on Disciplinary Education, 12*, 71-107. doi:10.30483/rijm.2021.254156.1011

Atash Ruz, B., Naderi, F., Pasha, R., Eftekhar Saadi, Z., & Askari, P. (2018). The effect of expectation-value motivation model on intrinsic and extrinsic academic motivation, and academic performance of mathematics. *Child Mental Health Quarterly, 5,* 2, 83-95.

Atashrouz, B., Naderi, F., Pasha, R., Eftekhar, Z., & Asgari, P. (2018). The effect of expectancy-value motivation model on academic motivation, educational engagement, and mathematic academic performance in students. *Quarterly Journal of Child Mental Health*, 5(2), 83-94. http://ensani.ir/file/download/article/1560861669-10008-15-9.pdf

Basu, S., & Bano, S. (2016). Intrinsic-extrinsic motivation and positive-negative affect of correlational home inmates. *Journal of Psychosocial Research, 11(*2), 497–505. ISSN 0976-3937, doi. www.printspublications.com

Brophy, J. E. (2010). *Motivating Students to Learn*. New York, NY: Routledge.

Bruinsma, M. (2004). Motivation, cognitive processing and achievement in higher education. *Journal of Learning and Instruction*. 14, 549–568, doi.org/10.1016/j.learninstruc. 2004.09.001

Coon, D., & Mitterer, J. O. (2013). *Introduction to psychology*: Gateways to mind and behavior (13th ed.). Wadsworth: Cengage Learning.

Durik, A. M., Vida, M., & Eccles, J. S. (2006). Task values and ability beliefs as predictors of high school literacy choices: A developmental analysis. *Journal of Educational Psychology*, 98, 382-393, doi:10.1037/0022-0663.98.2.382.

Eccles, J. S., & Wigfield, A. (1995). In the mind of the actor: The structure of adolescents' achievement task values and expectancy-related beliefs. *Personality and Social Psychology Bulletin, 21*, 215-225, doi. 10.1177/ 0146167295213003

Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). *Expectancies, values, and academic behaviors*. In J. T. Spence (Ed.), Achievement and achievement motivation (pp. 74-146). San Francisco, CA: W. H. Freeman

Ferguson, C. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology Research and Practice, 40,* 532-538, doi. 10.1037/a0015808.

Flake, J. K., Barron, K. E., Hulleman, C., McCoach, B. D., & Welsh, M. E. (2015). Measuring cost: The forgotten component of expectancy-value theory. *Contemporary Educational Psychology*, 41, 232-244, doi.org/10.1016/ j.cedpsych.2015.03.002



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

Flake, J. K. (2012). *Measuring cost: The forgotten component of expectancy-value theory* (Unpublished master's thesis). James Madison University, Harrisonburg, VA. https:// commons.lib.jmu.edu/master201019

Getty, S., Hulleman, C. S., Barron, K. E., Stuhlsatz, A. M. & Marks, J. C. (2013, April). *Factors that affect learning in high school science: Measuring motivation, achievement, and interest in science*. Paper presented at the annual meeting of National Association for Research in Science Teaching, San Juan, and Puerto Rico.

Ghodsi, A., Tale Pasand, S., Rezaei, A., & Mohammadi Far, M. (2019). Background of academic conflict: A model test based on Expectation-value theory. *Journal of Educational Psychology, 51*, 231-257, doi. 10.22054/JEP.2019.41786. 2675

Grays, M. P. (2013). *Measuring motivation for coursework across the academic career: A longitudinal invariance study (Unpublished doctoral dissertation)*. James Madison University, Harrisonburg, VA.

Hassan Zadeh, R., & Mehdi Nejad, G. (2013). The relationship between motivational orientations (intrinsic, extrinsic and unmotivated) and students' academic achievement in English. *Journal of School Psychology*, 3, 38-60, DOI. 10.4236/psych.2016.78112

Hooman, H. (2005). [Structural equation modeling using LISREL software]. Tehran: Samat. (In Persian)

Hulleman, C. S., Barron, K. E., Kosovich, J. J., & Lazowski, R. A. (2016). *Student motivation: current theories, constructs, and interventions within an expectancy-value framework*. In: Lipnevich AA, Preckel F, Roberts RD, editors. Psychosocial



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

skills and school systems in the 21st century. Springer, Cham; 241–278. In India. https://www.researchgate.net/publication/324819919

Javadi, A., & Faryabi, R. (2016). The relationship between motivation dimensions and academic performance in students of Birjand University of Medical Sciences. *Education Strategies in Medical Sciences*, 9(2), 142-149. http://edcbmj.ir/article-1-974-fa.html.

Kapur, R. (2018). Factors Influencing Performance and Job Satisfaction of Teachers in Secondary Schools in India https://www.researchgate.net/publication/324819919

Kasovich, J. J., Hulleman, C. S., Barron, K. E., & Getty, S. (2014). A Practical Measure of Student Motivation: Establishing Validity Evidence for the Expectancy-Value-Cost Scale in Middle School. *Journal of Early Adolescence*; 35(5-6), 790- 816. doi. 10.1177/027243161455689

Kline, R. B. (2015). Principles and practice of structural equation modeling. New York: Guilford; 3.

Lai, E. R. (2011). *Motivation: A Literature Review*.1-44. http://www.pearsonassessments.com/research

Lawrence, A. (2014). Relationship between study habits and academic achievement of higher secondary school students. *The Indian Journal of Medical Research, 4*(6), 143–145. doi: 10.15373/2249555X/June2014/43

Lazowski, R. A., Hulleman, C. S., Barron, K. E., & Getty, S. (2012). *Development of an expectancy-value scale for an online science curriculum.* Paper presented at the Motivation Retreat, University of Tubingen, Germany.

Lemos, M. S., & Verissimo, L. (2014). The relationships between intrinsic motivation, extrinsic motivation, and achievement, along elementary school. *Procedia – Social and Behavioral*



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

*Science, 112,* 930–938. doi:10.1016/J.SBSPRO.2014.01.1251.

Lipnevich, A. A., Preckel, F., Roberts, R. D. (2016*). Psychosocial Skills and School Systems in the 21st Century: Theory, Research, and Practice.* New York, USA, 241-287.

Maganga, J. H. (2016). *Factors Affecting Student's Academic Performance: A Case Study of Public Secondary Schools in Ilala District, Dar-es-salaam, Tanzania*. University of Tanzania.http://repository.out.ac.tz/1732/1/Jamillah__Maganga-Dissertation_14-10- 2016-Final.pdf

Maina, M. J. (2010). *Strategies employed by secondary school principals to improve academic performance in Embu West District*. A research project submitted in partial fulfilment for the requirement of a Master's Degree in the School of Education. Kenyatta University: Unpublished. http://ir-library.ku.ac.ke/handle/123456789/930

*Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2010). Self-determination theory and the relation of autonomy to self-regulatory processes and personality development. Handbook of personality and self-regulation, 169-191. Wiley-Blackwell,* https://doi.org/10.1002/9781444318111.ch8.

Odiri, O. E. (2015). *Relationship of study habits with mathematics achievement*. Journal of Education and Practice, 6(10), 168–170, Retrieved from: https://files.eric.ed.gov/ fulltext/ EJ1081665.pdf

Parsons, J. E. (1980). *Self-perceptions, task perceptions, and academic choice: Origins and change. (*Unpublished final technical report, ERIC Document Reproduction Service No.



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

ED 186577). Washington, DC: National Institute of Education.

Rashid, K., Yaqubi, A., & Karimi, K. (2020). Validation of expectation-value-cost scale in students of Hamadan University of Medical Sciences and Bu-Ali Sina University. *Iranian Journal of Medical Education*, 20(6), 43-53, https://ijme.mui.ac.ir/browse.php?a_id=4860&sid=1&slc_lang=en

Rashid, K., Zakeri, A., Salahshoori, A., Kord. Noghabi, R. (2012). The educational motivation of high school students in connection with the environmental factors, Journal of Educational Technology, 7(1), 11-20, https://dx.doi.org/10.22061/tej.2012.166

Red Martínez, D. L., Karanik, M., Giovannini, M., Pinto, N. (2015). Academic performance profiles: a descriptive model based on data mining. *European Scientific Journal*, 11, 9. ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55(*1), 68–78. doi.org/10.1037/0003-066X.55.1.68

Samavi, A., & Najar Pourian, S. (2019). The causal relationship between intrinsic motivation, academic conflict and academic self-regulation with academic performance through self-directed learning in high school students in Bandar Abbas. *Quarterly Journal of Cognitive Strategies in Learning*, *12*, 47-68. doi.10.22084/J.PSYCHOGY.2018.15114.1682

Schunk, D. H., Meece, J. R., & Pintrich, P. R. (2020). *Motivation in Education: Theory, Research, and Applications*. Pearson, England. https://www.amazon.com/Dale-H-Schunk/e/B001ILKFLO/ref=dp_byline_cont_book_1.



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

Sikhwari, T. D. (2014). A Study of the Relationship between Motivation, Self-concept and Academic Achievement of Students at a University in Limpopo Province, South Africa. *International Journal of Educational Sciences*, 6(1), 19-25 doi.10.1080/09751122.2014.11890113.

Srinivas, P., & Venkatkrishnan, S. (2016). Factors Affecting Scholastic Performance in School Children. *IOSR Journal of Dental and Medical Sciences*, *15*(7), 47-53, Retrieved from: http://www.iosrjournals.org, doi.10.9790/0853-150714753

Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector auto regressions with possibly integrated processes. J Econ, 66(1-2), 225-50.

Ulstad, S. O., Halvari, H., Sørebø, Ø. & Deci, E. L. (2016). "Motivation, learning strategies, and performance in physical education at secondary school". *Advances in Physical Education*, 6(1), 27-41. doi. 10.4236/ape.2016.61004

Utvaer, B. K. S., & Haugan, G. (2016). The academic motivation scale: dimensionality, reliability, and construct validity among vocational student. *Nordic Journal of Vocational Education and Training*, 6(2) 17–45. doi.10.3384/njvet. 2242-458X.166217

Vora, K., & Naik, R. (2016). Sports motivation among sports players: A gender Comparison perspective. *Journal of Psychosocial Research*, 11(2), 353–360.7

Waqar, S., Shafiq, S., & Hasan, S. (2016). Impact of procrastination and academic Motivation of academic self-efficacy among university students. *Journal of Humanities and Social Science, 21(*6), 7–13. doi. 10.9790/0837-2106040

Watkinson, E. J., Dwyer, S. A., & Nielsen, A. B. (2005). Children theorize about reasons for recess engagement: Does



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]

expectancy-value theory apply? *Adapted Physical Activity Quarterly, 22*, 179-197. doi. 10.1123/apaq.22.2.179

Wigfield, A., & Cambria, J. (2010). *Expectancy-value theory: retrospective and prospective*, Urdan, T.C. and Karabenick, S.A. (Ed.) The Decade Ahead: Theoretical Perspectives on Motivation and Achievement (Advances in Motivation and Achievement, Vol. 16, Part A), Emerald Group Publishing Limited, Bingley, 35-70, doi.org/10.1108/S0749-7423(2010)000016A005.

Wigfield, A., & Eccles, J. S. (2020). 35 years of research on students' subjective task values and motivation: A look back and a look forward. *In Advances in Motivation Science*, 7, 161-198. doi.org/10.1016/bs.adms.2019.05.002

Wigfield, A., Guthrie, J. T., Tonks, S., & Perencevich, K. C. (2004). Children's motivation for reading; Domain specificity and instructional influences. *The Journal of Educational Research*, *97*(6), 299–309. https://doi.org/10.3200/JOER.97.6.299-310

Wong, P. (2008). Transactions, transformation, and transcendence: Multicultural service-learning experience of preservice teachers. *Multicultural Education*, *16*(2), 31-36, https://files.eric.ed.gov/fulltext/EJ832225.pdf

Yang, Y., & Green, S. (2011). Coefficient alpha: A reliability coefficient for the 21st century? *Journal of Psychoeducational Assessment*, *29*, 377-392. doi. 10.1177/0734282911406668.

Yun, Lee Jia. (2019). the Relationship between Academic Motivation and Academic Procrastination among University Students. Factually of social science and humanities TUNKU Abdul Rahman university college. doi. 10.13140/RG.2.2.27474.81607 https://www.researchgate.net/publication/330410625.



[ Downloaded from ijpb.ir on 2026-11-21 ]

[ DOR: 20.1001.1.20081251.2021.15.2.6.7 ]

[ DOI: 10.66224/ijpb.15.2.177 ]