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Study of Academic Achievement and its Predictive Psychological Factors

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There is no doubt that the educational process consists of more than one or two factors. Several scholars maintain that it is important to put the emphasis on the role of psychological factors on academic performance. This study was an attempt to represent a pattern of correlations, through Structural Equation Modeling, among optimism, locus of control and academic achievement as well as the mediating effect of school satisfaction. Five-hundred and ten students, out a total population of the senior high-school (pre-university) male students, were selected randomly through cluster sampling. Data was collected through a set of questionnaires including: (1) Life Orientation Test-Revised Scale (Scheier &Carver, 1992), (2) School satisfaction sub-scale adopted from Satisfaction with Life Scale (Huebener, 1994), and (3) Internal-External Locus of Control Scale (Rotter, 1966). Data was submitted to a diagrammed structural equation model with its prerequisite exploratory factor analysis. The outcomes indicated that: (a) there is a bidirectional relationship between optimism and locus of control, (b) school satisfaction mediates the relationship between optimism and academic achievement, (c) the direct effect of school

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satisfaction on students' academic achievement and the indirect effect of optimism on academic achievement through the mediating effect of school satisfaction was significant, and (4) there is no significant effect of locus of control on academic achievement while the mediating effect of school satisfaction is taken into account. The goodness of fit index indicated that the proposed diagrammed model is appropriate.

***Keywords*:** academic achievement, locus of control, optimism, school satisfaction,

Students' academic achievement and success at school is the main objective in any educational system. Their successful growth and development that encompass gaining appropriate experiences in all aspects of cognitive, emotional, social, behavioral, and biological development are the main concerns of the society specially of the Education Organization. Obtaining such experiences at school can exert a decisive influence on children and adolescents' present and future life (Vander Zanden, 2007). School, where students spend most of their time, plays a significant role in their growth (Adrienne, Desantis, Scott, Shanmon, & suldo, 2006) . Therefore, recent research on student achievement in schools should not merely concentrate on academic achievement as cognitive functioning, but it also concerns optimal development of cognitive, affective, social, behavioral, and biological dimensions (Veronese, Pepe, & Afana, 2014; Zhang, Ming Li, Li, Li, Zhang, 2015). Optimism is one of the effective concepts which can influence academic achievement (Toor, 2009).

Optimism

Optimism is the tendency to believe, expect or hope that things will turn out well, even if something bad happens.

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Optimism, in Seligman, Reivich, Jaycox, and Gilham's (1996) terms has three components: permanence, pervasiveness, and personalization. Moore (1998),on the other hand, introduced the concept of dynamic optimism containing twelve key characteristics which are categorized within two general components: (1) positive interpretation of events (selective attention, refraining from complaint, sense of humor, sense of abundance, and challenging limitations), and (2) positive influence on outcomes (rationality, self-improving, experimentalism, self-confidence, self-worth, personal responsibility, and selecting environment). Some evidence (Carver, Scheier, Segerstrom, 2010; Chemers, Hu, and Garcia, 2001) suggests that optimism is associated with greater stability in academic efforts and higher incomes. Taati, Shokri and Shahidi (2013) report that in both sexes when individuals encounter academic stressors, the difference in reactions to stressors may be accounted for by the difference in the degree of optimism. Accordingly, researchers look at optimism as a personality trait which leads students to believe in their achievement and capacities in different areas. In addition, it is postulated that students possessing this trait pay more attention to the teacher's instruction which, in turn, leads to their academic achievement (Randolp, Kangas, & Ruokamo, 2010; Yates, 2002).

Similarly, Kapikiran, 2012; Ervasti, Mika, Riikka, Pauliina, Jaana, Sakari, et.al, (2011) found that positive emotions serve as a moderator of the relationship between optimism and life satisfaction. However, in Feldman and Kubota's (2015) study of a sample of 89 college students, counter evidence is provided, that is, optimism was not a strong predictor of academic GPA.

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Seligman (1996) views optimism as an *attributional style* that helps individuals attribute positive events to general and stable attributions and/or to themselves.

Locus of Control

Rotter (1966), through introducing the Theory of Social Learning, was among the first scholars who put forward his theory of the Locus of Control along with the relevant measuring scale. Locus of control is two dimensional: *internal* and *external*. Based on these dimensions, two main types of people can be recognized: The individuals with external-locus-of-control believe that their behavior and attitudes do not have any effect on the environmental stimuli they get; therefore, they do not try to improve the conditions (Sholtez & Sholtez, 2008). On the other hand, individuals with internal-locus-of-control, attribute their success to some internal causes (Taherpour, 1994). Barghi and Alipour (2000) observed that locus of control was a significant predictor of their participants' psychological well-being. Locus of control as a personality trait has gained increasing interest and vitality among researchers, especially those who focus on academic achievement. Some researchers (Hasan & Khalid, 2014; Hassaskhah & Jahedi, 2015; Özen kutanis, Mesci, Övdur, 2011) have found a positive relationship between internal locus of control and academic achievement. Houston (2015), in this regard, examined the role of dimensions of attributional style in predicting subsequent academic performance in both high- and low-achieving schoolers (N = 979) and showed that attributional styles predict higher levels of academic performance. In a similar vein, Sukariyah & Assad (2015), showed a positive effect of attribution retraining

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on students' academic achievement in mathematics and their attribution styles. However, the results of a study by Shehu & Bushi (2015) indicated that learning style as well as locus of control has no significant impact on academic performance of the students.

School Satisfaction

School satisfaction is known as one of the components of overall life satisfaction, cognitive appraisal of one's positive experience with school, and recognition of the positive experiences of school (Huebner & Gilman, 2006). Personal and environmental factors can affect students' school satisfaction as well as their achievement. Furthermore, class atmosphere (e. g., Randolph, Kangos & Rokamo, 2010), teaching: including curriculum content, teaching methods, assessment practices and support from school (Edraki, Rambod & Abdeli, 2011), teacher's support (Natvig, Albrektsen & Qvarnstrom, 2003; Randolph, Kangos & Rokamo, 2010), peers and friends (Natvig et al., 2003) and school culture (Umbach & Porter, 2002) can shape student satisfaction with school. Suldo, Rily and Shaffer (2006) found that school experience strongly influences students' academic goals and attitude towards school. Simialry, Simoes, Matos,Tome, Ferreira, and Chainho (2010) showed that the sense of belonging to school, efficient teacher-student relationships, cooperative life at school, and feeling safe at school contribute to students' well-being, school satisfaction and improvements in academic achievement. Some researchers (Karemera, Reuben & Shillah, 2003, Umbach & Porter 2002) pointed to the possible role of academic achievement on school satisfaction. This may be due to the fact that students with

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higher degrees of school satisfaction, try more to get better scores (Edraki, et al, 2011).

Given that academic achievement is one of the fundamental indices of efficiency in educational systems, exploring the effect of some vital variables that are imperative to academic achievement seems warranted. The current study was, thus, motivated, through Structural Equation Modeling (SEM), to find the pattern of relationship between optimism, locus of control and academic achievement while taking into account the meditating role of school satisfaction. Otherwise stated, the question is whether we can get to a pattern through SEM that shows the effect of optimism, locus of control and school satisfaction on the academic achievement of male students.

A diagrammed model (Figure 1) was, hence, designed to pattern the direct and indirect effects of the above-mentioned variables, the pattern(s) of relationship(s), and the mediating effect of school satisfaction through estimating goodness of fit index.

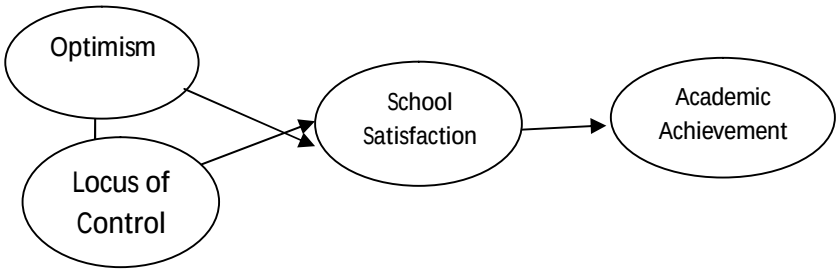


Figure 1. Diagrammed conceptual model of the study.

In order to investigate these interactions, the following hypotheses were formulated and tested.

1. Optimism is associated with locus of control.

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2. Optimism has a direct effect on school satisfaction.
3. Locus of control has a direct effect on school satisfaction.
4. Satisfaction has a direct effect on school achievement.
5. Optimism, via satisfaction, has an indirect effect on academic achievement.
6. Locus of control, via school satisfaction has an indirect effect, on academic achievement.

Method

The present study, due to its nature and objectives, employed a descriptive-correlational method through structural modeling equation. This method generally depicts which independent variable affects specified dependent variables; at the same time, the measurement quality of variables and acceptability of direct and indirect effects as well as specific interactions among variables are dealt with. The statistical population included all senior high-school (pre-university) students in Urmia. Of the total population, 510 subjects selected through cluster random sampling formulated the final sample.

Instruments

Life Orientation Test-Revised Scale (LOT-R) Questionnaires. Scheier & Carver, Optimism Questionnaire: The Life Orientation Test-Revised Scale (LOT-R), that assesses the individual's optimistic/pessimistic status, was originally developed by Scheier and Carver (1985). It comprises 10 items rated on a five-point Likert scale, with 0 meaning 'completely disagree' and 4 'completely agree'. The scores range from 0 to 27 with higher scores indicating higher levels of optimism. In an Iranian context, Goodarzi (2001) reported a Cronbach's alpha of

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0.70 for this scale. In this study, factor analysis that examined the fit of items lead to the exclusion of 3 unsuitable items. The internal consistency (a= .75), coefficient of this scale estimated through Cronbach's alpha, was within acceptable limits.

Satisfaction with Life Scale (SWLS). The SWLS introduced by Huebener (1994) contains 5 items that assess individuals' judgments of life satisfaction within the five domains of family, friends, self, school, and living environment (Zaki, 2007). It yielded a correlation of .60 with the Quality of Life Scale (Huebner & Gilman, 2006). In this study, the School Satisfaction subscale comprised 8 items which rated student satisfaction on a six-point Likert scale, in which number 1 indicated 'strongly disagree' and 6 meant 'strongly agree' (Huebner & Gilman, 2006). The internal consistency of this scale has been reported across numerous studies ranging between .70 to .90 (Greenspoon & Saklofske, 1997). Factor analysis also confirmed the multidimensionality of the SWLS scale (Huebner, 2001). The reliability index (*alpha* = .86) of the students' SWLS in the Iranian context was tested by Zaki (2007) over 200 subjects. Acquiring a higher score in this scale means greater level of life satisfaction whereas a lower score is a sign of lower life satisfaction for the individual respondents. In the current study, an alpha coefficient of .82 was obtained for school satisfaction subscale.

*Rotter's Internal-External Locus of Control Scale***.** Locus of control scale (LOC) that measures individuals' perceived generalized expectancies of internal or external control of reinforcement was adopted from Rotter (1966). The current

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study utilized its revised version that comprised 33 items. The scores were measured on a five-point Likert type scale, where 1 marked 'completely agree' and 5 meant 'completely disagree'. The scores in this scale range from 33 through 165 with the high scores indicating external orientation and lower scores reflecting internal orientation (Biaban Gard, 1991). Robinson, Shior, and Rotter's (as cited in Biaban Gard, 1991) have reported reliability indices of .73 and .70 through split-half method and Kuder- Richardson method on 400 subjects, respectively. In order to determine the test validity, Franklin (as cited in Biaban Gard, 1991), found out that all items had a significant correlation with the *general factor of personal*. In Iran, the test-retest reliability in Darabi's (1994) study was .75. In addition, Hosseinchari (2007) reported a reliability coefficient of .69 by using test-retest method within a three-week time interval. In the current study, the coefficient alpha for locus of control turned out to be .78.

Results

Data obtained through the questionnaires for each school factor were submitted to SPSS version 18 and Lisrel version 8.54. Before SEM was run, the researcher attested normality of distribution. Table 1 represents the descriptive statistics including means, SDs as well as the skewness, and kurtosis which represent normal distribution of the data.

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Testing the Theoretical Model and the Hypotheses

The correlation matrix that indicates significantly positive relationship among the variables (p = < .01 & p< .05) (Table 2) was established before the theoretical model was testified.

Table 1

Escriptive Statistics of the Variables

Variable	Low	High	Mean	SD	Skewness	Kurtosis
Academic Achievement	15.1	19.93	17.74	1.92	-.01	-.57
School Satisfaction	19	48	28.34	7.74	-.16	-1.09
Optimism	73	154	114.33	13.12	-.16	.34
Control Source	2	37	24.95	24.95	-.99	.94

Table 2

Correlation between the Variables

Item	Variable	1	2	3
1	Optimism	1		
2	Control source	.28**	1	
3	School satisfaction	.23**	.14**	1
4	Academic development	.11*	.10*	.26*

*p< .05, **p< .01

Predictors of Academic Achievement

The suggested theoretical model was examined by means of the Structural Equation Modeling through the use of maximum

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likelihood which predicted the academic achievement of the subjects. As the results of data normality (Figure 1) show, data are appropriate for use of maximum likelihood estimation. The goodness of fit indices proposed by Gefen, Straub, & Boudreau (2000) were utilized in the goodness of fit procedure in the present study. These indices include X^2/df with scores lower than 3 as acceptable; the goodness of fit index of GFI; comparative fit index (CFI) where scores of higher than .9 indicate goodness of fit; adjusted goodness of fit index (AGFI) consisting of values of higher than .8; parsimony fit index (PNFI) where values higher than .6 show appropriate fitness and root mean square error of approximation (RMSEA) including values lower than .08.

In the proposed model of the current study, academic achievement and school satisfaction are internal factors and optimism and locus of control are the external factors.

Direct Effects

Figure 1 shows the tested model of academic achievement. Also, Table 3 reports the variable values, direct effect values, standard error of mean, and t value.

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Table 3

Prediction of Direct Effect Values

Variables	Path	Standard error of mean	T	Sig.	Variable value
Impact of school satisfaction on academic achievement	.25	.08	4.86	.001	.40
Impact of optimism on school satisfaction	.20	.12	2.98	.01	.35
Impact of control sources on school satisfaction	-.02	.09	-.34	-	-.03

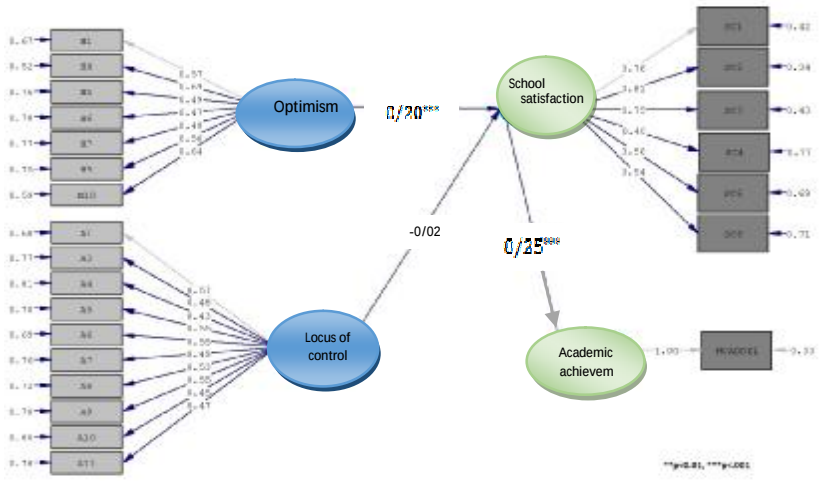


Figure1. Tested Model of Academic Achievement

With regard to Table 3, the direct effect of school satisfaction on academic achievement is positive (.25) and significant (p= .001). The same pattern is observed as regards the direct effect of optimism on school satisfaction which is positive (.20) and

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significant (p=.01). However, the direct effect of locus of control on school satisfaction is not significant (-.02).

Indirect Effects

One of the characteristics of the Structural Equation Modeling that enables researchers to examine the mediating effect of variables within the model is that it predicts the indirect effects of variables on each other. Table 4 summarizes the indirect values.

Table 4
Prediction of Indirect Impact Values

Variables	Variable value	Standardized value	Standard error of mean	T value	Sig.
Impact of optimism on academic achievement	.14	.05	.06	2.57	.05
Impact of control source on academic achievement	-.01	-.01	-.04	-.34	-

The indirect effect of optimism on academic achievement is positive and significant at p= .05 (Table 4). Due to the fact that this effect is established by means of school satisfaction, the mediating effect of school satisfaction on the relationship between optimism and academic achievement is confirmed. The indirect effect of locus of control on academic achievement is non-significant (-.01). The mediating role of school satisfaction

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on the relationship between locus of control and academic improvement is, thus, not confirmed. Regarding Tables 3 and 4, from among optimism, locus of control, and school satisfaction variables, the highest general effect belongs to the effect of school satisfaction on academic achievement (.25). The variables, in total, predict 6% of the variation in academic achievement. From among the variables affecting school satisfaction, the highest effect belongs to optimism (.20). All in all, variables predict 4 % of the variation caused by school satisfaction.

Table 5 shows goodness of fit indices of the tested model. With regard to Gefen, Straub, and Boudreau's (2000) indices, the tested model appropriately fits to the collected data.

Table 5
Goodness of Fit Indices of the Study

X^2/d.f.	PNFI	GFI	CFI	AGFI	RMSEA
2.41	.79	.90	.92	.88	.05

The meditating role of school satisfaction on the relationship between optimism and locus of control with academic achievement

The meditating role of school satisfaction was examined through the concurrent test of the model, the method proposed by Frazier, Tix and Barron (2004). They propose two models: (1) The model of direct effects in which the paths of optimism and locus of control are depicted in academic achievement and, (2) the mediating model (i.e., the model used in the present study), that assumes no effect of optimism and locus of control

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on academic achievement. If the $\chi 2$ difference between these two models (the direct/main effect and intervening effect) is significant, the mediating role of school satisfaction is confirmed. In the present study, $\chi 2$ for the direct effect model (*df*=247), and the mediation model (*df* =249) were found to be 597.89 and 600.77, respectively. Accordingly, the result was ($\Delta \chi 2 = 2.88$) which indicates a non-significant status with regard to *df* of 2. Therefore, the meditating role of school satisfaction on the relationship between optimism and academic improvement is confirmed. Since the indirect effect of the locus of control on academic achievement was non-significant, the meditating role of school satisfaction on the association between locus of control and academic achievement is, therefore, rejected. The general goodness of fit indices of the effects is shown in Table 6.

Table 6

Goodness of Fit Indices of Direct Effects

X^2/d.f.	PNFI	GFI	CFI	AGFI	RMSEA
2.42	.78	.90	.92	.88	.05

Table 6 shows that the addition of the direct paths of optimism and locus of control to academic achievement did not enhance the goodness of fit indices. This means that the model proposed in the current study was appropriate in relation to the model of direct effects or the competing model. Figure 2 shows the tested model of direct effects along with their t-value.

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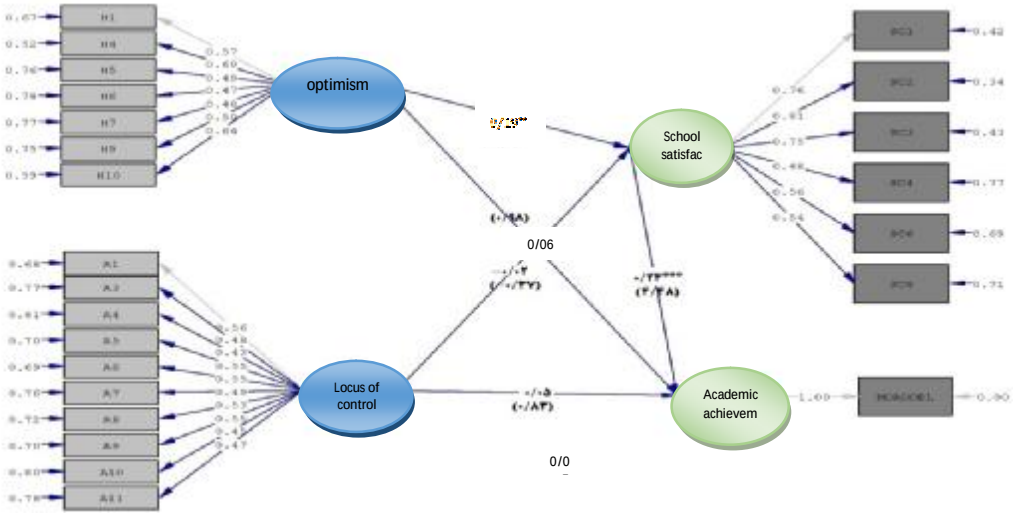


Figure 2. The Tested Model of Direct Effects Along with their T-Value

With respect to Figure 2, the direct effect of optimism (.06) and locus of control (.05) on academic achievement is non-significant. But, considering that the indirect effect of optimism through school satisfaction on academic achievement is significant, the mediating role of school satisfaction on the relationship between optimism and academic achievement is, thus, confirmed, although this role for the control resource is not confirmed.

Discussion

As already mentioned, this study was an attempt to represent the pattern of correlations, through Structural Equation Modeling, among optimism, locus of control, school satisfaction and academic achievement. In addition, the direct as well as indirect

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effect/s of variable(s) on each other was also examined. A conceptual model was, thus, proposed and examined through SEM. The findings indicated that the tested model appropriately fits the collected data.

Being in line with Seligman (1996), the findings indicated that there is positive and significant (r =.28) relationship between optimism and locus of control. This pattern of relationship between optimism and locus of control, psychologically speaking, can be traced back to the negative experiences one might have had in the past. Individuals who attribute their negative past-experiences to certain external factors are optimistic, however, pessimistic individuals attribute such experiences to some fixed internal factors. The concepts of optimism and attributional style, being distinct from each other, are in close relationship. Although both concepts emphasize that optimism or pessimism originate from individuals' expectations, attributional style refers to individuals' justification about the reasons why some events happen, whereas, optimism is directly related to one's expectations from the future.

Further scrutiny of the results implies that the findings corroborate with those reported by Kapikiran (2012), who indicated a direct effect of optimism on school satisfaction. Studies (Kapikiran, 2012; Ervasti et.al. 2011) exploring the indirect impact of optimism on school satisfaction (as one of the five elements of life satisfaction that Huebner proposed) maintain a positive and significant connection between the two variables. This means that optimism can indirectly influence satisfaction. It can, therefore, be concluded that an optimistic person views life events positively, this, in turn, increases his

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satisfaction with life, his living environment and school satisfaction.

The outcomes relating to the third hypothesis, however, did not indicate a significant relationship between locus of control and school satisfaction. This is in contrast with what Barghi and Alipour (2000) observed. Students with positive attributional style (internal locus of control) perceive themselves as capable individuals. Therefore, they control their own behavior and their environment, take responsibility for their actions and behavior, and actively and consciously try to manage the situations to ensure achieving their goals. Hence, it is assumed that such individuals are satisfied with their environment. However, in the current study, locus of control did not have any effect on the school satisfaction of the studied sample. The observed inconsistency in the outcomes can be either the result of respondents' carelessness in answering the questions or possibly due to selecting the sample only from male students.

Findings of the study related to the fourth hypothesis regarding the direct effect of school satisfaction on academic achievement revealed a positively significant relation. The output is in line with the findings of Edraki, et al (2011), Karemera, Reuben and Shillah, (2003) who provided evidence that school satisfaction exerts positive influence on academic achievement. Similarly, Edraki, et al (2011) believe that students who are more satisfied with school work harder to get better scores due to the fact that their school satisfaction correlates with their motivation, personality, academic achievement, and professional accomplishments.

Further scrutiny of the findings proved that a positive relationship between good performance in school and

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satisfaction can be predicted; since a higher level of performance results in a sense of competence, mastery, and self-confidence in children and improves positive attitudes toward school. School satisfaction increases the sense of belonging and dependence on school and the learning environment; influences an individual's motivation and interest and consequently, leads to increase in a positive attitude toward learning and education. Moreover, it increases motivation and, as a result, academic achievement. Students who like school have a good relationship with their friends and peers and they have a good feeling about attending school. This positive outcome promotes courage as well as motivation, and results in competition among students.

Statistical testing of the fifth hypothesis revealed a positive and significant indirect effect of optimism on academic achievement. The same pattern of findings was reported by Carver, et al. (2010), Chemers, et al. (2001), Edraki, et al (2011), Ervasti, et al (2011) and Simoes, et al (2010). Referring back to the findings related to the second research hypothesis, it was observed that optimism has a direct effect on school satisfaction, which in turn, as the results of the fifth hypothesis ratify, has a direct effect on the academic achievement of the students. Thus, this hypothesis is approved and confirmed through various studies including (Rendal et al, 2009; Yates, 2002) who report similar results, that is, optimism influences achievement in school. Rendal et al, (2009) believe that optimism brings about positive self-perceived success and abilities in different fields. Students with such characteristics pay more attention to what teachers teach in the classroom. Such positive attention leads to their academic achievement. Similarly, Ervasti, et al, (2011) believe that positive attitudes

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towards school are related to the students' success, motivation, and interest

The finding related to the sixth hypothesis concerning the relationship between locus of control and academic achievement through school satisfaction demonstrated that the indirect effect of locus of control on academic achievement is not meaningful. This finding is in line with those of Shehu and Bushi (2015) who indicated that learning styles as well as locus of control have no significant impact on academic performance of the students. The finding, however, is in contrast with what Hasan & Khalidaa (2014), Hassaskhah & Jahedi (2015), Özen et al (2011) pointed out in their investigation of the relation between attributional style and academic achievement of boys and girls. It is deemed possible that different findings (i.e., no relations) would have been obtained if the above studies investigated internal-external dimensions rather than controllability.

Given that the current study was limited to the male students of grade four in high school, the findings cannot be generalized to females and students in other grades. Further limitations emerge from the nature of the self-report data collection tools that normally reduce attention. In spite of the mentioned limitations, further studies that investigate the influence of other variables such as different personality characteristics, parents' child rearing styles, and learning styles on school satisfaction are recommended. In addition, gender, as a moderator variable should also be taken into account as regards the relations between optimism, locus of control, school satisfaction, and educational outcomes.

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