

The effects of stress and self-esteem on life satisfaction of high school students: The moderated mediation model of growth mindset

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Abstract

Background/Objectives: The purpose of this study was to examine whether growth mindset moderates the mediation effect, when self-esteem mediates between stress and life satisfaction for high school students.

Methods/Statistical analysis: In this study, SPSS win. 25.0 and PROCESS macro for SPSS version 3.4 were used for frequency, reliability, correlation, and moderated mediation effect analysis.

Findings: First, it was noted that stress had significantly negative correlation with self-esteem and life satisfaction, but not with growth mindset. Second, as the result of moderated mediation effect analysis, the growth mindset had significant conditional indirect effects on the path to stress, self-esteem and life satisfaction. Thus, it is discovered that the mindset for growth moderated the path of relationships among stress, self-esteem and life satisfaction.

Improvements/Applications: This result suggested mitigation measures through growth mindset in situations where stress adversely affects quality of life for high school students in Korea.

Keywords: Stress, Growth mindset, Self-esteem, Life satisfaction, High school student, Moderated mediation effect.

1. INTRODUCTION

Life's satisfaction is the highest good that man seeks, and is therefore seen as the underlying motive for all human actions[1]. Life satisfaction is an evaluation of an individual's life based on synthesis of his reflection, value, and his experiences, achievements, quality of relationships, and his function across different areas of life[2].

This incidence of life satisfaction is reported to be affected by various variables. In other words, a study was conducted that the satisfaction of life was influenced by academic, occupational and marital status such as external, situational or upward factors. However, a number of studies have more interested in identifying the effects of internal and downward attributes in the individual, such as adaptability, personality, and self-

esteem[3].

In addition, the prevailing discipline notes that personal characteristics, social and cultural characteristics, self-efficacy, positive emotions, subjective well-being, race, culture, occupation, religion, marriage, family environment, and interpersonal relationships are factors that affect life satisfaction [4,5]. Also, it is known that the level of life satisfaction is determined by genetic factors according to the personality and temperament of the individual, environmental factors faced by the individual, and psychological factors, which are the internal environment of the individual. Among them, psychological factors can change the level of life satisfaction more than 40%. The reason for this result is that in the long run, genetic factors are most closely related to the level of happiness, but in the temporary sense, life satisfaction is more affected by the events and psychological factors experienced by individuals[6]. Therefore, there are many factors and variables that affect a person's overall life satisfaction, and further research is needed to discover more regarding these factors and results. In particular, one of the variables influencing adolescent's life satisfaction is stress, which requires more research going forward.

Stress, on the other hand, not only causes the incidence of chronic disease, but also affects the course and outcome of the disease, and ongoing stressful situations lead to various physical and psychological problems and affect life satisfaction [7]. Upon review of a study of college students showed that stress is a variable affecting life satisfaction. In other words, the lower the stress, the greater the satisfaction of life for most individuals[8]. In other words, stress affects emotional and behavioral problems, and self-esteem mediated in this relationship[9]. In addition, self-esteem is a stress buffer that protects individuals from stress[10], and student's stress negatively affects self-esteem[11]. In the preceding studies, it was shown that stress acts as a variable that negatively affects various positive aspects such as quality of life. Going forward, research in high school students also needs to determine how stress negatively affects life satisfaction.

Self-esteem turns out to be a very strong and predictive factors of life satisfaction[12]. It is a subjective evaluation of one's own liking, respect, and worthiness, and is defined as a degree of respect oneself[13]. Broadly speaking, it also represents the degree to which humans believe in their ability, importance, success, and value in their personal assessment of themselves, expressed in a positive or negative attitude[14]. By the same token, self-respect is also an individual evaluation of self-worth, defined as a positive or negative view of one's existence[15]. In this sense, a person with high self-esteem thinks of himself as a valuable competent being and has a sense of satisfaction with himself. Although having very high self-esteem leads to negative consequences, most people who have high self-respect seem to lead happy and productive lives[16]. Some self-esteem has been reported to play a role in relieving stress[17]. However, in this instance it is important to identify whether self-esteem mediates between stress and life satisfaction for high school students.

Growth mindset, a moderate and moderated mediation variable in this study, has recently emerged in positive psychology and has become a key variable in various fields. Mindsets are beliefs about one's intelligence or ability[18]. Mindsets are based on an implicit theory or self-theory. It is shown that implicit theories are people's perceptions of the psychological characteristics of themselves, their surroundings, others, and their relationships[19]. Unlike explicit theory, which interprets surrounding situations or individuals based on data empirically measured by experts, implicit theories are invisible informal beliefs. In that case, it provides a framework for that implicitly predicting the surroundings and interpreting meaning.

Sociocognitive motivation models were first proposed by Dweck and Leggett[20]. This suggests that goal orientation depends on the mindset and that performance results in different perceptions of their abilities and subsequent achievement reactions [21,22,23,24,25].

Looking at the extended sociocognitive motive model, the goal orientation varies depending on the mindset. This brings us to understand that people with a fixed mindset tend to think of intelligence as being fixed, and they are more interested in identifying their level of ability and aiming at performance goals than improving it. Conversely, a person with a high growth mindset believes that intelligence can be improved, and he actually tries to improve it, and therefore is aimed at mastery goals. However, they experience difficulties or failures in performing tasks, while fixed mindset disposition interprets failure as lack of self-ability, while growth mindset disposition thinks that various variables are the causes such as efforts, learning strategies, and external situations that affect learning.

People with mindsets of high growth perceive that they can improve their intelligence and skills through work and dedication[26]. Students with high growth mindsets also are likely to think about academic life in terms of learning, growth and development[27].

Growth mindset, meanwhile, has been reported to play a moderator or moderated mediator in many studies. In other words, in the study of adults, growth mindset showed moderated mediation effects on the relationship between authentic leadership, hope and organizational effectiveness[28]. It was noted that in a study of middle school students reported that growth mindset plays a moderated mediation role in the path of parental abuse damage, self-esteem, and school violence damage[29]. From these results, it is necessary to confirm whether the growth mindset moderates the path between stress, self-esteem, and life satisfaction in high school students.

Therefore, this study analyzed whether growth mindset moderates the mediation effect when self-esteem mediates between stress and life satisfaction for high school students, and provided mitigation measures through growth mindset in situations where stress adversely affects quality of life.

The following are the research questions for achieving this purpose. Firstly, what is the correlation between stress, growth mindset, self-esteem, and life satisfaction? Secondly, do growth mindsets moderate the path between stress → self-esteem → life satisfaction?

2. RESEARCH METHOD

2.1. Research Model

The main analysis method of this study is the moderated mediation effect analysis by using model 58 of PROCESS macro ver. 3.4. In this case, the conceptualized research model for this analysis is set in Figure 1.

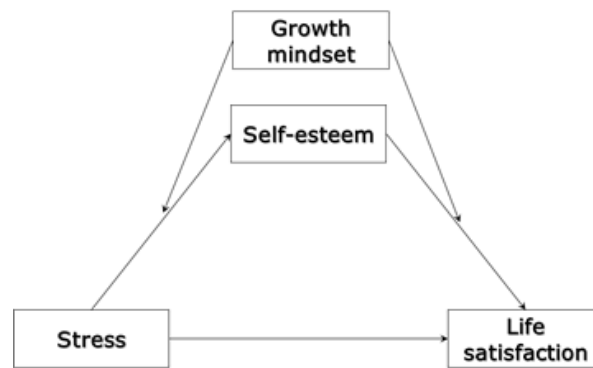


Figure 1. Conceptual model of the moderated mediation effect

2.2. Survey Subject and Data Collection Method

The area of the survey was D city, Chungnam province, and 479 high school students who were purposively selected from five high schools. In this case, the data were collected through questionnaires. The researchers visited five schools and introduced the purpose of the study, and then distributed the questionnaires to students and collected.

In this study, the subjects were 62.2% of females and 37.8% of males. The academic score was 52.5% for middle, 31.7% for lower, and 15.8% for upper. Additionally, the most common form of family member was 74.4% of living with their parents, and 65.7% responded that their parents work together for living.

2.3. Research tools

2.3.1. Stress

In this study, adolescent stress was measured using the BEPSI-K (Brief Encounter Psychosocial Instrument). In these terms, this scale was composed of a Likert scale with 5 points, and the higher scores, the higher stress levels. The internal consistency of the stress in this current study was Cronbach's α .876.

2.3.2. Growth mindset

In this study, we used the growth mindset scale which was developed by Dweck[30] and translated and used by researchers. This scale is a total of 8 questions, 4 questions measuring the belief in the change of intelligence and 4 questions measuring the belief in the change of personality. Additionally, this scale is a Likert 5-point scale and higher scores indicate higher growth mindset. The internal consistency of growth mindset in current study was Cronbach's α =.830.

2.3.3. Self-esteem

In order to measure the self-esteem scale, we used the Self-Esteem Scale (RSES) developed by Rosenberg[31]. In fact, this scale is a 5-point scale of Likert, with a total of 5 positive and 5 negative questions. In this case, higher scores mean higher self-esteem. The internal consistency of self-esteem in this study was Cronbach's α =.840.

2.3.4. Life satisfaction

In order to measure life satisfaction, we used the short-term happiness scale developed by Seo and Gu[32]. Broadly speaking, the scale consists of three questions measuring personal, relational, and collective satisfaction, and six questions asking about the emotions experienced over the a past month. Here, it is noted as a 7-point Likert scale. The higher the score, the higher the satisfaction level of life. The internal consistency of life satisfaction in current study was Cronbach's α =.873.

2.4. Data analysis

In this study, we used SPSS Win 25.0 and SPSS PROCESS macro for collected data analysis. The focus of the frequency analysis and reliability analysis were undertaken for basic analysis. In addition, Pearson's correlation analysis was utilized to identify the associations between major variables, and model 58 of the SPSS PROCESS macro was used to verify moderate mediating effects.

3. RESULTS AND DISCUSSION

3.1. Correlation between variables

Pearson's correlation analysis was performed to identify the associations among stress, growth mindset, self-respect and life satisfaction. The results are reported in Table 1. Particularly, it was shown that stress had significantly negative associations with self-respect and satisfaction with life. However, stress did not show a significant associations with growth mindset. Growth mindset, self-esteem and life satisfaction were all positively correlated in this case. It was also shown that positive variables, growth mindset, self-esteem and life satisfaction, were higher than 3 points, and stress, negative variables, was noted at lower than 3 points.

Table 1: Results of correlation analysis and descriptive statistics

	Stress	Growth mindset	Self-esteem	Life satisfaction
Stress	1			
Growth mindset	-.064	1		
Self-esteem	-.318**	.341**	1	
Life satisfaction	-.324**	.258**	.554**	1
M	2.9706	3.4703	3.4576	4.8382
SD	.96935	.69671	.61543	1.27504

**p<.01

3.2. Moderate mediation effect of growth mindset

To verify whether the growth mindset moderates the mediating effects of self-esteem in the relationship between stress and life satisfaction of high school students, we analyzed the data based on the model 58 of the PROCESS macro proposed by Hayes[33]. A bootstrap was used to verify moderated mediation effect. During bootstrap verification, the number of bias-corrected bootstrap samples was set to 5000 and the confidence interval was 95%. The values of stress, growth mindset, and self-esteem were mean-centered. The analysis results are reported in Table 2.

First, as a result of analyzing whether the growth mindset moderates the relationship between stress and self-esteem, the interaction term between stress and growth mindset was shown to be significant ($-.0988, p < .01$) and the increase of R^2 according to the interaction term ($R^2 = .0113, p < .01$) was also significant. Therefore, the moderated effect of growth mindset on the relationship between stress and self-esteem was proved.

Due to the result of conditional effect analysis of stress according to the growth mindset value, the conditional effect was significant in M-SD, M, and M + SD of the growth mindset value.

With this in mind through the current analyzing the significance area of moderating effect, the conditional effect of stress was significant when the value of growth mindset was higher than $-.9884$.

Second, as a result of analyzing whether the growth mindset moderates the relationship between self-esteem and life satisfaction, the interaction term between self-esteem and growth mindset was significant ($.2218, p < .01$) and increasing amount of R^2 ($.0113, p < .01$) according to the interaction term was also significant. Therefore, it is shown in this case that the moderated effect of growth mindset on the relationship between self-esteem and life satisfaction was proved.

As a result of the conditional effect analysis of self-esteem according to the growth mindset value, the conditional effect was significant in $M-SD, M,$ and $M + SD$ of growth mindset value. As a result of analyzing the significance area of moderated effect, the conditional effect of self-esteem was significant when growth mindset was noted to be higher than $-.9884$.

Third, as a result of analyzing the conditional indirect effect of growth mindset on the path of stress on life satisfaction through self-esteem, the conditional indirect effect was verified by the significance in all $M-SD, M, M + SD$ values of growth mindset. In other words, growth mindset moderated the path leading to stress, self-esteem and life satisfaction. In particular, these findings suggest that the growth mindset moderated an significant influence of stress on the satisfaction of life through self-esteem, and for that reason it is meaningful to solve the stress problem using the growth mindset.

Table 2: Results of moderated mediation effects of growth mindset

Variables	Effect	SE	t-value	p	LLCI*	ULCI**
Mediation variable model (Dependent variable: Self-esteem)						
Constant	-.0045	.0247	-.1831	.8548	-.0531	.0441
Stress	-.1904	.0256	-7.4430	.0000	-.2406	-.1401
Growth mindset	.2927	.0359	8.1542	.0000	.2222	.3632
Stress x Growth mindset	-.0988	.0378	-2.6148	.0092	-.1731	-.0246
R^2 increase depending on interaction:						
	R^2		F		p	
Stress x Growth mindset	.0113		6.8372		.0092	
Conditional effects of stress at values of growth mindset:						
Growth mindset	Effect	se	t-value	p	LLCI*	ULCI**
-.6974	-.1214	.0384	-3.1643	.0017	-.1968	-.0460
.0000	-.1904	.0256	-7.4430	.0000	-.2406	-.1401
.6974	-.2593	.0350	-7.4083	.0000	-.3280	-.1905
Conditional effect of stress at values of growth mindset:						
Growth mindset	Effect	se	t	p	LLCI	ULCI

-1.9650	.0038	.0807	.0473	.9623	-.1548	.1625
-1.7900	-.0135	.0745	-.1809	.8565	-.1598	.1329
.						
.						
.						
-1.0900	-.0826	.0504	-1.6384	.1020	-.1818	.0165
-.9884	-.0927	.0472	-1.9650	.0500	-.1854	.0000
-.9150	-.0999	.0449	-2.2279	.0264	-.1881	-.0118
.						
.						
.						
1.3600	-.3247	.0553	-5.8763	.0000	-.4333	-.2161
1.5350	-.3420	.0612	-5.5880	.0000	-.4623	-.2218

Dependent variable model (Dependent variable: Life satisfaction)

Variables	Effect	SE	t-value	p	LLCI*	ULCI**
Constant	4.8017	.0492	97.6100	.0000	4.7050	4.8983
Stress	-.1974	.0518	-3.8111	.0002	-.2992	-.0956
Self-esteem	1.0142	.0877	11.5632	.0000	.8418	1.1865
Growth mindset	.1248	.0737	1.6943	.0909	-.0199	.2695
Self-esteem x Growth mindset	.2218	.0955	2.3233	.0206	.0342	.4095

R² increase depending on interaction:

	R ²	F	p
Self-esteem x Growth mindset	.0113	6.8372	.0092

Conditional effect of self-esteem at values of growth mindset:

Growth mindset	Effect	se	t-value	p	LLCI*	ULCI**
-.6974	-.1214	.0384	-3.1643	.0017	-.1968	-.0460
.0000	-.1904	.0256	-7.4430	.0000	-.2406	-.1401
.6974	-.2593	.0350	-7.4083	.0000	-.3280	-.1905

Conditional effect of self-esteem at values of growth mindset:

Growth mindset	Effect	se	t-value	p	LLCI	ULCI
-1.9650	.0038	.0807	.0473	.9623	-.1548	.1625
-1.7900	-.0135	.0745	-.1809	.8565	-.1598	.1329
.						
.						
.						
-1.0900	-.0826	.0504	-1.6384	.1020	-.1818	.0165
-.9884	-.0927	.0472	-1.9650	.0500	-.1854	.0000

	-0.9150	-0.0999	.0449	-2.2279	.0264	-.1881	-.0118
				.			
				.			
				.			
	1.3600	-.3247	.0553	-5.8763	.0000	-.4333	-.2161
	1.5350	-.3420	.0612	-5.5880	.0000	-.4623	-.2218
Direct effect of stress on life satisfaction:							
Effect	se	t-value	p	LLCI*	ULCI**		
	-.1974	.0518	-3.8111	.0002	-.2992	-.0956	
Conditional indirect effects of stress on life satisfaction:							
Growth mindset	Effect	se	t-value	p	LLCI*	ULCI**	
	-.6974	.8594	.1084	7.9284	.0000	.6464	1.0724
	.0000	1.0142	.0877	11.5632	.0000	.8418	1.1865
	.6974	1.1689	.1118	10.4532	.0000	.9491	1.3886

*LLCI = lower limit within 95% confidence interval of boot indirect effect

** ULCI = upper limit within 95% confidence interval of boot indirect effect

4. CONCLUSION

The purpose of this study was to analyze whether growth mindset moderates the path of the mediation effect of stress on life satisfaction through the self-esteem for high school students in Korea. The conclusions of the study are as follows. First, stress had a negative correlation with self-esteem and life satisfaction, but not with growth mindset. Second, the growth mindset had significant conditional indirect effects on the path to stress, self-respect and satisfaction with life. Thus, it was determined that the growth mindset moderated the path of stress, self-esteem and life satisfaction of the study participants.

Limitations for further study are as follows. Since this study was limited to studying participants in the city of D, further research is needed to expand the survey to the whole country, and to increase the possibility of generalization of several demographics of participants with the country. Second, although this study found that the mindset for growth moderated the path to stress, self-esteem, and life satisfaction for high school students, this study showed limitations in identifying specific reasons for this result. Future research needs to elucidate the role of growth mindset by applying qualitative research methods to results and studies going forward.

ACKNOWLEDGMENT

This study was done with the support of a research grant in 2019 from Hanseo University.

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