

The Mediating Role of Rumination in Adolescent Life Events and Junior High School Students' Doubt of Learning Value

Jing Xu^{1,2a}, Chunlei Fan^{1b}, Ligang Wang^{1c}, Ting Tao^{1d}, Wenbin Gao^{1e*}

^a404327932@qq.com, ^b fancl @psych.ac.cn, ^cwanglg@psych.ac.cn, ^dtaot@psych.ac.cn,
^e*gaowb@psych.ac.cn

¹Institute of Psychology, Chinese Academy of Sciences, Beijing 100101, China

²Department of Psychology, University of Chinese Academy of Sciences, Beijing 100049, China

Abstract: Objective To explore the mediating role of rumination in the life events of adolescents and the value doubt of junior middle school students. **Methods** 968 junior high school students in Nanjing were investigated by using the Scales of Value of Learning(SVL), Ruminative Response scale(RRS) and Adolescent Self-rating Life Events Checklist(ASLEC). **Results** Life events were significantly correlated with learning value doubt, rumination and the three dimensions of rumination (forced thinking, introspection and symptomatic rumination). The symptom rumination dimension of rumination plays a mediating role between life events and learning value doubt, and the mediating value should account for 40% of the total effect. **Conclusion** Life events can affect the doubt of learning value through symptom rumination, which reflects the effect of symptom rumination on enhancing the doubt of learning value. Psychological intervention related to depression for junior high school students can help alleviate the doubt of learning value of junior high school students.

Key words: adolescent life events; doubt of Learning value ; rumination; junior high school students

1 Introduction

School alienation or weariness is an increasingly prominent adverse phenomenon among junior high school students^[1]. When entering junior high school, students often face greater pressure in academic work than those in primary school because the learning content, and methods are completely different from those in primary school^[2]. However, students at this stage are in the second leap of self-awareness. They will think about the value of learning and will be troubled by why they are learning. Learners' judgment of the value of learning objects^[3] is the sense of doubt of learning value, which is simply the students' understanding of whether learning is useful or not. If they do not correctly recognize the value of learning, it is difficult for them to hold a positive attitude towards learning, and their subjective initiative in learning decreases, which will have a negative impact on their knowledge mastery and academic performance. If they are not guided, it will even produce a vicious circle^[4]. Paying attention to the value of learning can help us understand the value orientation of students to learning activities and grasp the learning and development of students.

Life events refer to all kinds of stressful or stimulating events experienced by individuals in social life, such as family changes, academic pressure, parent-child conflicts, etc^[5]. Life events are a kind of psychosocial stressors, which often have a negative impact on people's physical and mental health^[6]. The physical development of adolescents is rapid, but the mental development is relatively stable, which results in various contradictory behaviors. Adolescents are not yet mature psychologically, so they often face various psychological crises at this stage. Life events tend to have a greater impact on adolescents than adults.

Rumination, also known as rumination thinking, refers to the repeated attention of individuals to their negative emotions, their causes and the possible consequences of the event after experiencing a negative event^[7], which is often related to negative emotions. Rumination focuses the individual's attention on his or her own dark side, which exacerbates negative emotions and depressive symptoms^{[8][9]}.

In summary, this study intends to explore the relationship among life events, learning value doubt and rumination among junior middle school students, in order to relieve the learning pressure of junior middle school students, improve the degree of psychological stress of junior middle school students, carry out targeted mental health education for junior middle school students, prevent adolescent psychological and behavioral problems, and provide theoretical support for improving the mental health level of junior middle school students.

This study proposes the following hypotheses: 1. There is a significant positive correlation between life events and learning value doubt among junior middle school students; Second, rumination and its dimensions play a mediating role between adolescent life events and doubt of learning value. The purpose of this study is to test the above hypothesis.

2 Objects and Methods

2.1 Objects

The paper questionnaires were distributed to students from Grade one to grade three of a middle school in Nanjing by convenient sampling method. 1061 questionnaires were received, of which 968 were valid, with an effective rate of 91.2%. In terms of gender, there were 535 boys (55.3%) and 433 girls (44.7%). In grade, 282 students (29.1%) were in grade 7, 377 students (38.9%) were in grade 8, and 309 students (31.9%) were in grade 9. The average age was 13.46±0.91 years.

2.2 Research tool

2.2.1 Learning Value Doubt Scale (SVL)

The scale was compiled with reference to the skepticism subscale of patterns of adaptive learning scales (PALS)^[10] on the impact of learning on future life. The SVL was a 5-point scale, in which choice 1 indicated strong disagreement and was counted as one point. Choice 2 indicates some disagreement and counts two points; If you choose 3, you are not sure. Choice 4 indicates some agreement, counting four points; If you choose 5, you strongly agree. Items 2, 4, 7 and 10 of the scale are scored in reverse. The items were summed to obtain the total score of learning value doubt. The higher the total score, the stronger the suspicion of learning value.

The Cronbach's α coefficient of the SVL was 0.71, which indicated that the SVL had high reliability in this study.

2.2.2 Rumination Scale (RRS)

RRS was compiled by psychologist Nolen-Hoeksema and revised into Chinese by Xiu Han and Hongfei Yang[11]. The scale consisted of 22 items and three dimensions, including forced thinking, introspection and symptom rumination. The first dimension consists of five items (5, 10, 13, 15, 16), the second dimension consists of five items (7, 11, 12, 20, 21), and the third dimension consists of twelve items (1, 2, 3, 4, 6, 8, 9, 14, 17, 18, 19, 22). The questionnaire was scored on a 4-point scale, in which choice 1 indicated never, and one point was calculated. The choice of 2 means sometimes, two points; Choose 3 means often, mark 3; 4 means always, 4 points. The total score of each dimension was obtained by adding the items of each dimension, and the higher the total score of each dimension, the more serious the thinking tendency of the subjects in this dimension. The total score of rumination was obtained by summing the total scores of the three dimensions, and a higher total score of rumination indicated a more severe tendency of the subjects to ruminate. The Cronbach's α coefficient of Rumination scale is 0.94, which has high reliability

2.2.3 Adolescent Life Events Inventory (ASLEC)

ASLEC was compiled by Xianchen Liu, Lianqi Liu et al[12]. and verified by Xiuhong Xin and Shuqiao Yao[13]. It was used to assess the frequency of adolescent life events and the stress intensity of adolescents when responding to such events. The ASLEC consisted of 27 items and was scored on a 5-point scale. Where 1 means it never happened, and the score is 0. 2 means no effect, 1 point; 3 represents mild impact and is assigned 2 point; 4 represents moderate impact and is assigned 3 points; 5, severe impact, 4 points; 6 represents extremely heavy impact and is given 5 points. The period of assessment was within the past 12 months. The total score was obtained by summing the items. A higher total score indicates a higher stress intensity in response to life events. The correlation coefficient between each ASLEC event score and the total ASLEC score was 0.2412 to 0.5662, with an average of 0.4461. The Cronbach's α coefficient of 27 items in ASLEC was 0.93, which indicated that the internal consistency of the scale could be approved.

2.3 Statistical analysis

Statistical analysis was conducted using SPSS 22.0 software. The measurement data is subject to Normal distribution through normality test, it is described by $\bar{x}\pm s$. The mean between the two groups is compared by group t test. The mean between multiple groups is compared by variance analysis of completely randomized design data. The mean between groups is compared in pairs by LSD method; The Pearson correlation analysis method was used to analyze the correlation between indicators. The Bootstrap method is used to test the mediating role. Using SPSS22.0 software and model 4 of SPSS PROCESS macro program version 3.4 to analyse the mediating role. Set to extract 5000 bootstrap samples, if its 95% confidence interval (CI) does not contain 0, it means that the the mediating role is significant, otherwise it means that the the mediating role is not significant.

3 Results

3.1 Common method bias and control

Since the questionnaires in this study were completed by the same subjects, the possibility of a serious common method bias problem cannot be ruled out. After testing the data with Harman's single-factor method, it was found that there were 11 factors with a characteristic root ratio of 1, and the first factor explained 26.43% of the variance, which was less than the critical standard of 40%. Therefore, there was no major common method bias in this study.

3.2 Correlation analysis of adolescent life events, suspicion of learning value, rumination and their dimensions

In this study, the score of adolescent Life Events Scale was 28.37 ± 19.58 , the score of Learning Value doubt Scale was 21.87 ± 6.08 , the score of rumination scale was 47.23 ± 13.85 , the score of forced thinking was 12.27 ± 3.68 , and the score of introspection was 10.60 ± 3.45 . Symptom rumination score was 24.36 ± 7.80 .

Pearson correlation analysis showed that the influence of adolescent life events was significantly positively correlated with the suspicion of learning value ($r=0.17, P < 0.001$). Among the three dimensions of rumination, forced thinking ($r=0.45, P < 0.001$) and introspection ($r=0.45, P < 0.001$) were significantly positively correlated with adolescent life events, but there was no statistical significance in the correlation analysis with the sense of learning value doubt. Symptom rumination was significantly positively correlated with adolescent life events ($r=0.57, P < 0.001$) and learning value doubt ($r=0.17, P < 0.001$), and rumination was significantly positively correlated with adolescent life events ($r=0.54, P < 0.001$) and learning value doubt ($r=0.12, P < 0.001$). See Table 1.

Table 1 Correlation analysis of adolescent life events with learning value doubt and rumination (n=968, r value)

Variable	Adolescent Life Events Inventory total score	The total score of the Learning Value Doubt Scale	Forced thinking	Introspection	Symptomatic rumination
The total score of the Learning Value Doubt Scale	0.17***				
Forced thinking	0.45***	0.04			
Reflect upon	0.45***	0.05	0.74***		
Symptom Rumination	0.57***	0.17***	0.78***	0.78***	
Total score on the Rumination Scale	0.54***	0.12***	0.89***	0.89***	0.97***

Note: *** represents $P < 0.001$.

3.3 Model test of mediating effect of rumination between adolescent life events and doubt of learning value

Adolescent life events were used as the independent variable, rumination as the mediating variable, and doubt of learning value as the dependent variable to test the mediating effect. The results showed that the regression coefficient of learning value doubt on life events was significant ($B=0.05$, $P<0.001$), the regression coefficient after adding the mediating variable was significant ($B=0.04$, $P<0.001$), and the regression coefficient of rumination on life events was significant ($B=0.39$, $P<0.001$). However, the regression coefficient of learning value doubt on rumination is not significant, which indicates that rumination does not play a mediating role between life events and learning value doubt in junior high school students, and the mediation model is not valid. See Table 2.

Table2 Mediating model tests of adolescent life events, doubt of learning value and rumination among junior high school students

Variable	Learning value doubt			Rumination			Learning value doubt		
	B	SE	t	B	SE	t	B	SE	t
Adolescent Life Events	0.05	0.01	5.22***	0.39	0.02	20.67***	0.04	0.01	3.76***
Rumination							0.18	0.02	1.06
R		0.17			0.55			0.17	
R ²		0.03			0.31			0.03	
F		27.27***			427.43***			14.20***	

Note:***represents $P < 0.001$.

3.4 Model test of mediating effect of symptom rumination between adolescent life events and suspicion of learning value

With adolescent life events as the independent variable and the dimension of rumination -- symptom rumination as the mediating variable, The suspicion of learning value was used as the dependent variable to test the mediating effect model. The results showed that the regression coefficient of learning value doubt to life events was significant ($B=0.05$, $P<0.001$), the regression coefficient after adding the mediating variable was significant ($B=0.03$, $P<0.05$), and the regression coefficient of symptom rumination to life events was significant ($B=0.23$, $P<0.001$). The regression coefficient of learning value doubt to symptom rumination was significant ($B=0.09$, $P<0.01$). This suggests that symptom rumination plays a partial mediating role in the relationship between life events and learning value doubt in junior high school students. See Table 3.

Table3 Test of the mediating model of adolescent life events, doubt of learning value and symptom rumination in junior high school students

Variable	Learning value doubt			Symptom rumination			Learning value doubt		
	B	SE	t	B	SE	t	B	SE	t
Adolescent Life Events	0.05	0.01	5.22***	0.23	0.01	21.75***	0.03	0.01	2.57*
Symptom rumination							0.09	0.03	3.00**
R		0.17			0.57			0.19	

R ²	0.03	0.33	0.04
F	27.27***	473.26***	18.25***

Note: *represents $P < 0.05$, **represents $P < 0.01$, ***represents $P < 0.001$.

The results of non-parametric percentile Bootstrap mediation effect model test show that life events have a significant direct effect on learning value doubt among junior high school students (The Bootstrap 95% confidence interval of the coefficient is 0.010~0.007, excluding 0). Symptom rumination had a significant mediating effect between life events and the suspicion of learning value (The Bootstrap 95% confidence interval of coefficient accumulation 0.007~0.034, excluding 0). The mediating effect accounted for 40% of the total effect. See Table 4.

Table4 Breakdown table of total effect, direct effect and mediation effect

Effect	Effect size	Standard error	Lower limit	Upper limit	Relative effect size
Total effect	0.052	0.010	0.000	0.032	
Direct effect	0.031	0.012	0.010	0.007	60%
Mediator effect	0.021	0.007	0.007	0.034	40%

The mediation effect model diagram is shown in Figure 1.

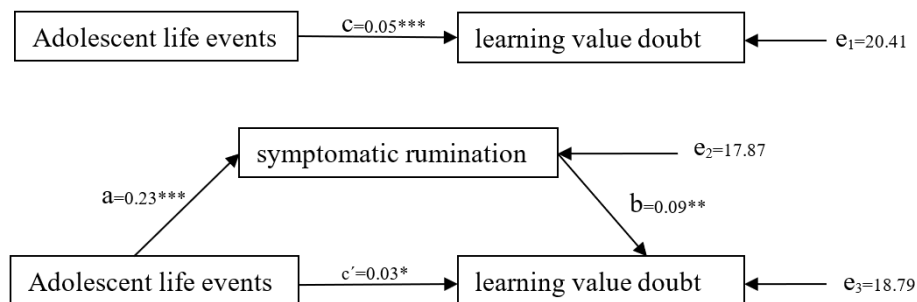


Figure1 Diagram of the mediation effect model

4 Discussion

The results of Pearson correlation analysis in this study show that: First, life events are significantly positively correlated with rumination among junior middle school students, which is consistent with the research results of Pai Wang, Wenbo Li and Xiaojie Sun^{[14][15]}. As to the reason, this study believes that life events provide a basis for rumination, and junior high school students will have negative emotions after experiencing life events. In addition, junior high school students' psychology is not mature, and they will think about the event repeatedly. Second, rumination is significantly positively correlated with the suspicion of learning value. This study believes that the reason is that junior high school students can't focus on learning when they are immersed in negative emotions, and they have a negative tendency to be tired of learning, which leads to negative cognition of the value of learning. Third, in junior middle school students,

Life events are significantly positively correlated with the sense of doubt of learning value. This study believes that there are two reasons. First, negative emotions generated by life events will hit learners' subjective initiative in learning. Second, some life events enhance junior high school students' doubt of learning value, such as poor test scores, do not want to go to school, etc.

According to the results of the mediation effect model test of rumination and its symptom rumination dimension in this study, rumination did not play a mediating role between life events and doubt of learning value in junior high school students, but symptom rumination played a partial mediating role between them. This study suggests two reasons. First, in junior middle school students, symptom rumination is significantly positively correlated with life events and learning value doubt, but the other two dimensions of forced thinking, introspection and learning value doubt have no statistical significance in Pearson correlation analysis. Forced thinking and introspection affect rumination, so rumination does not play a mediating role between life events and doubt of learning value in junior middle school students. Second, symptom rumination refers to symptom-based rumination related to depression. According to Xinchun Wu's review of rumination and mental health^[16], the more serious the tendency of rumination, the more serious the depression will be, and the longer it will last. Due to their immature mind and less social experience, teenagers are more likely to be affected by life events. Therefore, after experiencing life events, they go through the processing of depression, which discourages junior high school students' enthusiasm for learning and deepens their doubts about the value of learning.

5 Conclusion

In conclusion, some of the hypotheses proposed in this study were confirmed. Life events, learning value doubt and rumination were significantly correlated in junior middle school students. Rumination did not play a mediating role between life events and learning value doubt in junior high school students, but the dimension of rumination and depression related symptom-based rumination played a partial mediating role between life events and learning value doubt in junior high school students. Life events can not only affect learning value doubt directly, but also affect learning value doubt through symptom rumination.

At present, the mental health and behavior problems of junior high school students are becoming more and more prominent, which also receive more and more attention from the society. This study explored the relationship between the impact of life events, the doubt of learning value, rumination and its dimension symptom rumination in junior middle school students, and drew enlightenment: Reducing the stress degree of junior high school students to life events can help to prevent their suspicion of learning value. At the same time, it is necessary to pay attention to the mental health status of junior middle school students, timely intervention when junior middle school students experience life events, provide necessary psychological energy, timely enlightenment, and reduce symptomatic rumination, which will help reduce the negative impact of life events on junior middle school students and improve their learning enthusiasm.

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