



The Associations of Family Functioning with Learned Helplessness: A Moderated Mediating Model

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Abstract. Objective: To explore the relationship between family functioning, action control style, self-esteem and learned helplessness among rural secondary vocational school students. Methods: The learned helplessness scale, ASC-90 scale, The Family Functioning Rating Scale (FAD) of Chinese Revised and Self-esteem scale (SES) were used to survey 250 secondary vocational school students. Results: (1) Family functioning positively predicted learned helplessness. (2) The mediating role of action control style between family functioning and learned helplessness was significant. (3) The mediating role of action control style was moderated by individual self-esteem. Conclusions: Family functioning positively predicted learned helplessness and also influenced learned helplessness through the mediation of action control style. The individual self-esteem played a significant moderating role between action control style and learned helplessness.

Keywords: Learned helplessness · Family functioning · Action control style · Self-esteem

1 Introduction

Secondary vocational school students are a vulnerable group to the phenomenon of learned helplessness (Zhu Jinchao, 2010) [11]. Learned helplessness refers to the “conditioning” of the human/animal after repeating failures and setbacks in which the individual acquires the belief that no matter what he/she does, he/she will not be able to change the current situation or the future. He/She is incapable of controlling the situation that the human/animal will give up some kind of resistance or effort and stop trying to get out of the painful or bad situation (Seligman, 1967) [26]. Psychologists have long believed that learned helplessness is strongly associated with parenting style and family environment. Filippello & Luana Sorrenti (2015) [17] found that parental psychological control was negatively associated with school self-efficacy among 186 school students aged 14–18 years. School psychological efficacy fully mediated the relationship between parental psychological control and learned helplessness. A study by Corine showed that children’s learned helplessness was associated with controlling parenting and parental anxiety states. They were significantly correlated (Corine, 2008) [16].

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Family functioning is a comprehensive assessment of family system functioning, family members' relationships and family adaptability. The current exploration of family functioning mainly adopts the process theory orientation represented by Skinner and Epstein. It focuses on the process by which the family system achieves each function. It defines family functioning in terms of the tasks accomplished by the family and contains seven dimensions: role, communication, emotional involvement, emotional expression, values, control and task completion (Skinner & Steinhauer 2000) [27]. Family functioning is closely related to individual physical and mental health. For example, the frequency and quality of parent-child communication is significantly associated with adolescents' implicit and explicit problem behaviors. Parent-child conflict can negatively affect adolescents' antisocial behavior, interpersonal adjustment and emotional control. Brouillard explored the relationship between parent-child conflict and a range of mental health problems. It showed that parent-child conflict was associated with depression and suicidal ideation. They were significantly and positively correlated (Brouillard, et al., 2018) [14].

Action control was first proposed by Kuhl, a German psychologist. He believed that in the process of executing goals, individuals will encounter various kinds of interference. It is necessary to eliminate interference in order to ensure the achievement of goals. This process of eliminating interference is action control. Action control consists of two major parts: action control style and action control strategy. Action control style is divided into action-oriented and state-oriented. Action-oriented individuals are better at using action control strategies to protect current intentions in the face of interference while state-oriented individuals influence the use of action control strategies. As an individual's personality tendency, the formation of action control style is influenced by personal life experiences and learning processes. It's closely related to parenting styles and socialization processes. First, the parent-child relationship and the form of interaction during childhood influence the development of individual's action control style. Second, overprotection can lead to parental dependence which will prevent children from developing autonomous, self-directed activities. On the other hand, overprotection can lead to irrational beliefs that are based on unmet needs. Furthermore, too much stimulation and external control interventions can interrupt the individual's activities and raise his or her action control threshold. They will lead to a lack of decisiveness and insufficient action (Feng Monv, 2015) [1].

As a distal environment for individual development, family functions influence learned helplessness behavior by affecting mental health factors such as individual's emotion regulation. First, Bowlby's attachment theory suggests that attachment to parents early in life will internalize a child's internal working model that transcends time and space. This working model forms the basis of an individual's emotional responses in other contexts and has a profound impact on an individual's later social adjustment and emotional regulation skills. Bar-Haim (2007) [13] and others found that children who established a secure early attachment in children had better emotional adjustment later in life. Second, attachment lays the foundation for emotion regulation only. Children can eventually develop good emotion regulation is also closely related to their parents' continuous parenting (Wang Yulong, Yao Zhihong, Jiang Jinwei, 2016) [8]. Research shows that both the process and outcome of family functioning are significantly related to adolescents' emotional problems. The process of family functioning not only has a

directly but also indirectly affects adolescents' emotional regulation through the mediating variable of the outcome of family functioning (Xu Jie, Fang Xiaoyi, et al., 2008) [10]. The improvement of the process of family functioning not only directly improves adolescents' mental health but also indirectly affects adolescents' psychological regulation again by influencing the outcome of family functioning. Finally, individual action control is closely related to emotion regulation. Koole's (2007) [18] study found that the implicit self and emotion regulation play a very critical role in volitional action control. The action-oriented individuals can automatically initiate the regulation of negative emotions and state-oriented individuals promote the persistence of negative emotions under the threshold. The implicit self and emotion system of action-oriented individuals are strongly linked. A small amount of activation can influence the allocation of cognitive resources by down-regulating negative emotions whereas state-oriented individuals have a weaker association between their implicit selves and the emotion system require more activation to effectively regulate emotions. The development of this emotion regulation-related action control style is inextricably linked to the family upbringing (Feng Moni, Liu Xiaoming, 2015) [1]. The lack of action control associated with emotion regulation is one of the important reasons for the development of learned helplessness. Kuhl (1981) [20] proposed a three-factor hypothesis for learned helplessness: It suggested that individuals' expectations and motivation to complete a test task were not reduced by experiencing frustration in the training task but rather motivated them to want to succeed in the test task (Atkinson 1958; McClelland, Atkinson, Clark & Lowell, 1953) [12] [22]. The failure on the test task is associated with deficits in behavioral control. Deficits in behavioral control may be achieved through adherence to emotions and cognitions associated with failure where individuals are unable to focus their attention exclusively on task-related intentions. They may concentrate on information related to present, past, or future states which ultimately lead to task failure (Kuhl, 1984) [21] and produce the phenomenon of learned helplessness. It leads to research hypotheses:

H1: Family functioning positively predicts learned helplessness.

H2: Action control style mediates the relationship between family functioning and learned helplessness.

According to Kuhl, the two most important tasks of volition are the maintenance of personal goals and the integrity of the self. The former is called "action control" and the latter "self-regulation" (Kuhl, 1984) [21]. According to the PSI theory of action control, volitional activities are coordinated by various psychological subsystems (such as external or implicit cognition, motivation, emotion, arousal, etc.). Their roles cannot be separated and viewed in isolation. It is important to examine the regulatory role of cognition in volitional activities and self-esteem is an important factor of self-perception. Self-esteem refers to an individual's emotional experience and evaluation of self-worth developing during the socialization process (Tian Lumei, Li Shuang, 2005) [6]. Self-esteem is not only closely related to psychological qualities but also an important protective factor for an individual's mental health. Self-esteem alleviates negative emotions such as depression and anxiety. It's like the immune system of consciousness that providing immunity and regeneration for the individual psyche. Depletion of self-esteem can damage the individual's psychological protection system and lead to a series of

psychological problems such as depression affecting the individual's ability to regulate emotions. It leads to research hypothesis:

H3: Individual's self-esteem plays a moderating role in the second half of the above mediated model.

2 Method

2.1 Sample

The questionnaire was administered on site to 270 students from two secondary vocational schools in Guangxi. 252 responses were collected after eliminating invalid questionnaires, 240 responses were determined with an efficiency rate of 95.23%. 135 were male and 105 were female. Their average age was 16.44 year ($SD = 0.76$). 175 were from rural areas and 65 were from towns. 190 were ethnic minority students and 50 were Han Chinese students.

2.2 Materials

1) **Learned Helplessness Scale.**

Wu Xiaoyan, et al. (2009) [9] developed a Chinese localized learned helplessness scale with 18 questions which divided into two dimensions: helplessness and despair. The scale was scored on a five-point Likert-type self-assessment scale. Score of 1 for complete non-compliance and 5 for complete compliance. The higher scores indicate more severe learned helplessness. The Cronbach's α for the total scale and the two subscales were 0.87, 0.97 and 0.63, respectively.

2) **Action Control Style Scale ASC-90.**

Kuhl developed the Action Control Scale ASC-90 which is divided into three dimensions: failure, decision and performance. Each dimension consists of 12 questions. Every question has two answers, one score for correct and zero score for incorrect. Due to the instability of the performance dimension, two dimensions of failure and decision can be used when applying this scale (Liu Xiaoming and Liu Hong, 2012) [4]. Above-average scores are action-oriented and below-average scores are state-oriented. The Cronbach's α for the total scale and the two subscales of this measurement were 0.87, 0.86 and 0.85, respectively.

3) **Family Functioning Assessment Scale FAD of Chinese Revision.**

The FAD was originally developed by Epstein, et al. to measure family functioning based on the McMaster Model of Family Functioning (MMFF) theory and the factor structure varied by culture. The study used the Chinese version revised by Rongfeng Li and Fuzhen Xu in 2013 with 30 questions in five dimensions: emotional communication, positive communication, egoism, problem solving and family rules [2]. Four-point scale was used with scores ranging from 1 to 4 on a scale of "not at all" to "completely". The higher scores indicate poorer family functioning. The Cronbach's α for the total scale and the five subscales were 0.76, 0.70, 0.58, 0.61, 0.51 and 0.60, respectively.

4) **Self-esteem Scale SES.**

The Self-Esteem Scale (SES) developed by Rosenberg in 1965 which was originally used to assess adolescents' general feelings about self-worth and self-acceptance. It consisted of 10 items on a four-point scale. Score 4 indicate a high compliance, 3 indicate compliance, 2 indicate low compliance and 1 indicates very low compliance. 1, 2, 4, 6, 7, 8 questions are forward scoring. 3, 5, 9, 10 questions are reverse scoring. The total score range of 10 ~ 40 points. The higher scores indicate higher level of self-esteem. The Cronbach's α for this measurement was 0.80.

5) **Control of Common Method Deviations.**

The following measures were used to control for the study to avoid the common method effect: (1) We adopted the methods of balancing the order between items. Cross-over between forward, reverse scoring and anonymous responses were adopted to reduce the chance of common bias. (2) Some heterochronic measurements were used. Several scales were administered to students in different classes over multiple periods of time. (3) We used Harman's one-way test. Results showed that a total of five factors had a characteristic root greater than 1 with a cumulative contribution of 62.37%. The variance explained by the factor ranked first was 35.10% which was less than the critical value of 40%. It suggested that there was no significant common method bias problem in this study.

6) **Experimental procedure.**

The experiment was conducted in unison with the empirical study of three-factor learned helplessness of secondary vocational school students. The samples came from two vocational schools in different areas. The most important feature of data collection is heterochronic and heterogeneous segmental measurement. Three steps were as follows: (1) Studied each scale carefully, mixed questions with different dimensions, reverse and positive scoring. Then disrupted the order for anonymous responses. (2) Only one class from each school was selected to administer the test for the first time. Under the guidance of the psychology teacher and the classroom teacher, one scale was administered every other day. The whole data were analyzed. (3) The remaining classes were administered the test every other day under the guidance of the psychology teacher and the classroom teacher after one week. We should ensure that the students' answers were true.

2.3 Data Analysis

SPSS 26.0 and the POROCES macro program written by Haye were used for the analysis. Model 4 of PROCESS was used for the mediating effect test analysis and model 14 for the mediating effect analysis with moderation. The significance tests of regression coefficients were all performed using Bootstrap method (1000 repetitions of sampling).

Table 1. Descriptive statistics of variables and product-difference correlation analysis (n = 240)

	1	2	3	4	5	6	7
1. Learned helplessness	0.87						
2. Action Control Style	-0.63 **	0.87					
3. Self-esteem	-0.46**	0.38**	0.80				
4. Family Functions	0.20*	-0.26*	-0.18*	0.76			
5. Age	0.10	-0.08	0.04	-0.04			
6. Gender	0.10	-0.13*	0.02	0.02	0.10		
7. Whether to stay behind	-0.12*	-0.06	0.04	0.07	-0.02	0.07	
M	46.92	12.52	26.17	75.24	16.44	1.45	1.73
SD	14.99	4.55	4.01	9.96	0.76	0.50	0.45

Note. * P<0.05, **P<0.01, ***P<0.001. Gender: 1 for male, 2 for female. Whether to stay-behind: 1 for yes, 2 for no. The data on the diagonal are Cronbach's a coefficients.

3 Result

3.1 Related Statistics

The results of the correlation analysis of all study variables are shown in Table 1. H1 was preliminarily supported by the fact that learned helplessness scores were negatively correlated with action control style and self-esteem scores, positively correlated with family functioning scores. Action control style scores were positively correlated with self-esteem scores and negatively correlated with family functioning scores. Family functioning scores were negatively correlated with self-esteem scores. Action control style was negatively correlated with the gender of the sample. In other words, the scores of male students were higher than those of female students. The scores of staying behind experience and learned helplessness were significantly and negatively correlated. That is, the scores of learned helplessness were relatively higher for samples with left-behind experience.

3.2 The Relationship Between Family Functioning and Learned Helplessness: A Test of the Mediating Effect of Action Control Style

Model 4 (mediation model) of PROCESS v3.4 was used to calculate the mediation effect of action control style between family functioning and learned helplessness. A bias-corrected percentile Bootstrap (1000 repetitions) was used to test for the mediation effect. The results showed that the total effect of family functioning on learned helplessness was significant ($\beta = 0.15, p = 0.03$) and the direct effect was not significant ($\beta = 0.06, p = 0.41$). The Bootstrap test showed that the mediating effect of action control style between family functioning and learned helplessness was significant ($\beta = 0.09, \text{Boot SE} = 0.09$) with Boot confidence intervals of [0.01, 0.27]. The ratio of mediating effect to total effect was 60%. Action control style played a fully mediating role between family functioning and learned helplessness. The mediation model was valid and H2 was argued.

Table 2. Mediated effects of family functioning on learned helplessness with moderation test (n = 240)

Variables	Equations 1			Equations 2			Equations 3		
	Valid standard: LH			Valid standard: ACS			Valid standard: LH		
	SE	β	t	SE	β	t	SE	β	t
1 Gender	0.11	0.39	1.04	0.78	-1.15	-1.48	0.02	0.47	0.73
2 S-B	0.34	-0.70	-1.15	0.87	-0.42	-0.49	0.22	0.41	1.54
3 FF	0.09	0.09*	1.93	0.04	-0.30*	-2.73	0.11	0.03	0.72
4 ACS							0.23	0.80***	-7.76
5 S-E							0.26	-0.35*	-3.49
6 ACS*S-E							0.04	0.07*	1.73
R ²	0.14			0.40			0.46		
F	15.63*			44.90*			29.04***		

Note. LH-learned helplessness ACS-action control style S-B-stay-behind
 FF-family functions S-E-self-esteem

Table 3. Analysis of the moderating effect self-esteem (n = 240)

S-E	EV	Boot SE	BootCI UL	BootCI LL
M-1SD	0.08	0.09	0.10	0.28
M	0.07	0.08	0.09	0.23
M+1SD	0.05	0.07	0.07	0.21

Note. S-E-self-esteem EV-effect value
 UL-upper limit LL-low limit

3.3 The Testing of Intermediary Model with Moderation

The moderating effect of self-esteem was tested by Model 14 of SPSS plug-in PROCESS v3.4 (a mediating model for the second half of regulation) with the following four steps: (1) Eq. 1 tested whether the predictive effect of family functioning on learned helplessness was significant. (2) Eq. 2 tested whether the predictive effect of family functioning on action control style was significant. (3) Eq. 3 tested whether the predictive effect of action control style on learned helplessness and the interaction term predictive effect of action control style and self-esteem. (4) To test whether the R-squared of the interaction term is greater than the R-squared without the interaction term when it is entered into the regression equation. According to the correlation statistics in Table 1, age was not significantly correlated with any of the variables, only gender and left-behind experience were put into the equation as control variables. In each equation, all predictor variables were standardized and the variance inflation factor (VIF) of all predictor variables was not higher than 1.2. There was no significant multiple co-linearity problem. The detailed results are shown in Table 2.

The results showed that the regression coefficient $\beta = 0.09$ in Eq. 1 was marginally significant ($p = 0.054$). Family functioning positively predicted learned helplessness with a 95% confidence interval of [0.01, 0.46]. H1 was again argued. Equation 2 predicted

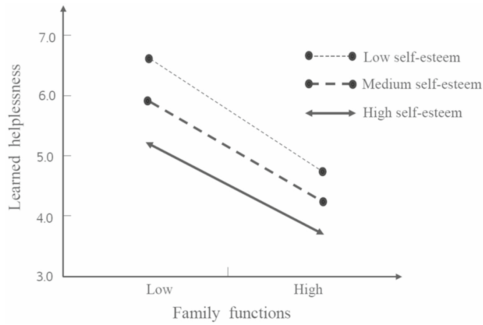


Fig. 1. Self-esteem moderation effect

significant effects with a 95% confidence interval of $[-0.17, -0.05]$. Equation 3 had a significant predictive effect, $\beta = -0.80$ ($p < 0.001$) with a 95% confidence interval of $[-1.27, -0.35]$. The R-squared of Eq. 2 was 0.40. The R-squared of Eq. 3 with the addition of the interaction term was 0.46. The value of the change in R-squared was $0.46 - 0.40 = 0.06$. The test in step (4) was satisfied. In Eq. 3, action control style significantly and negatively predicted learned helplessness. The interaction term between action control style and self-esteem was a significant predictor of learned helplessness, $\beta = 0.07$ ($p < 0.05$) with a 95% confidence interval of $[0.013, 0.161]$. Self-esteem moderated the second half of the mediated model's path and the mediated model with moderation held.

To reveal more clearly the interaction effect between action control style and individual self-esteem of rural Secondary vocational school students. Further simple effects analysis was performed. As suggested by Preacher, et al., self-esteem was grouped to one standard deviation above and below the mean. The mean plus one standard deviation was the high self-esteem group and the mean minus one standard deviation was the low self-esteem group. Figure 1 shows a simple slope diagram of self-esteem regulation and Table 3 shows the analysis of the effect of self-esteem regulation. Figure 1 and Table 3 were analyzed in combination: the negative predictive effect of action control style on learned helplessness was significant for secondary vocational school students in the low self-esteem subgroup with a moderating effect of self-esteem $\beta_{\min} = 0.08$, $\text{BootSE} = 0.09$, 95% confidence interval $[0.10, 0.28]$. In the high self-esteem subgroup, the negative predictive effect of action control style on learned helplessness was diminished with a moderating effect of self-esteem, $\beta_{\max} = 0.05$, $\text{BootSE} = 0.07$, 95% confidence interval $[0.07, 0.21]$. The indirect effect of family functioning on learned helplessness through action control style among rural secondary vocational school students was moderated by individual self-esteem. The indirect effect index = 0.02, $\text{BootSE} = 0.01$, 95% confidence interval was $[0.003, 0.017]$. H3 was argued.

4 Discussions

4.1 The Mediating Role of Action Control Styles

The results suggest that action control style plays a fully mediating role between family functioning and learned helplessness. On the one hand, as an external factor to the

individual, family functioning does not necessarily act directly on external behavior but plays a role through internal factors of the individual. Personality traits are an important internal factor. It has been shown that family parenting styles during early childhood have an important influence on the development of individual action control. Caring and supportive family parenting styles predict high levels of individual action control more than harsh and conflicting family parenting styles. Positive parental guidance leads to greater use of constructive ways to cope with frustration such as distraction whereas a tendency toward commanding and controlling family parenting leads to less use of adaptive regulation strategies. Coercive and arbitrary family parenting is positively associated with low action control in children (Calkins, Dedmon, Gill, Lomax & Johnson, 2002) [15]. Action control styles affect individuals' use of cognitive resources. State-oriented individuals develop negative emotions and cognitions that severely interfere with information processing of the task and exhibit cognitive. These behavioral deficits (Kuhl, 1981) [20] are prone to learned helplessness.

On the other hand, different action control styles affect individuals' choice of motivation and their performance and control of behavior (Kuhl, 1994) [19]. Action-oriented individuals actively adopt strategies to solve problems. The correct use of action control strategies helps action-oriented individuals to spend more cognitive resources on a given task. State-oriented individuals tend to stay on the negative side of things, diminish cognitive resources and hinder the individual's ability to adopt correct strategies to complete the task. Action control strategies regulate emotions, motivation and cognition associated with goal attainment (Wolters, 2003) [31]. Individuals are required to use action control strategies to protect goal attainment when coping with stressful goals to protect ongoing intentions from distractions and regulate conflicts between external demands and their own needs (Zimmerman, 2000) [32]. Action control strategies take over and accompany the mental history after goal setting and participate in the re-rating of motivational goals. They can allow individuals to better control and utilize multiple goal resources and effectively coordinate the achievement of multiple goals in a task (Wang Li Rong, Qin Hong Fang, 2011) [7]. In summary, action control style influences individuals' learned helplessness by affecting the use of action control strategies. It is an important mediating variable between family functioning and learned helplessness.

4.2 The Moderating Effect of Self-esteem

The results showed that the interaction term between action control style and self-esteem reached significant levels ($p = 0.05$) when family functioning was used as the independent variable and learned helplessness was used as the dependent variable with controlling for gender and left-behind experience. On the one hand, individual action control styles of state-oriented redundant and ruminative thinking were associated with lower levels of self-esteem. Ruminant thinking has been pointed out as a key factor influencing mood disorders such as depression and as a significant predictor of such mood disorders (Nolen Hoeksema, 2000; Robinson & Alloy, 2003) [23][24]. People with low externalized self-esteem are more inclined to focus on their shortcomings and inadequacies. They encode negative information more fully that may exhibit more ruminative thinking (Tafarodi, Mashall, & Milne, 2003) [29]. The emotional changes produced by rumination affect cognitive processing by taking up the individual's cognitive resources which lead

to passive behavior and inhibiting him or her from taking effective measures for the task at hand (Ruigendijk & Koole, 2014) [25]. Then producing the phenomenon of learned helplessness. The higher the level of self-esteem, the more pronounced the buffering effect on difficult stressful events. When faced with various conflicts the less stress they experience, they can adopt reasonable strategies to deal with the problem (D. Li, M. Huang, W. Chen, W. Wu, 2019) [3]. The above suggests that individual self-esteem is prone to influence action control styles and serves to regulate learned helplessness.

On the other hand, the self-esteem protection theory of learned helplessness suggests that learned helplessness arises because people have a strong desire to protect their self-esteem from harm (Peng Yajing, 2007) [5]. When individuals experience multiple failures in uncontrollable situations, they will attribute the cause to their own lack of ability if they continue to try and still fail. That is undoubtedly very damaging to their self-esteem. To protect their self-esteem, individuals tend to reduce their efforts that resulting in worse performance and forming learned helplessness. In other words, learned helplessness becomes a form of defense by which individuals avoid the pain of a blow to their self-esteem (Snyder, 1989) [28]. Witkowski's (1998) [30] study showed that individuals who completed the task in the open condition experienced more learned helplessness than those in the confidential condition. Because the failure or frustration they experienced while completing the task in the open condition weakened their self-esteem whereas in the confidential condition did not. Individuals will make less effort. It shows that learned helplessness is somehow a means of protecting and enhancing self-esteem and self-esteem plays a moderating role in learned helplessness.

4.3 Significance and Limitations of the Study

This study has certain implications: First, most previous studies have examined the relationship between family relationships and individual volitional abilities from a single factor and lacked a deeper perspective of the role of family systems. Second, the lack of individual action control and learned helplessness caused by the family environment has significant implications for future prevention and intervention efforts that examined from the perspective of the family functional system. The limitations of the study are specifically: First, the number of samples used is small. The study population and experimental setting are relatively homogeneous. The generalization of the study results needs to be treated with caution. Future studies should be extended to different populations of different age groups to make the results more objective. Second, the characteristics of changes in the time course of the variables could not be obtained and failed to reveal the causal relationship between the interaction of the factors with using a cross-sectional design. The development of adolescents' volitional ability has a complex relationship with the environment, individual differences and age groups. The model of longitudinal studies should be adopted in the future. Third, each test scale was completed by the students themselves which is prone to subjective bias. Future studies should increase the scale information answered by parents and teachers for comprehensive evaluation. Fourth, only the psychological factors of volitional ability and learned helplessness of secondary vocational school students were investigated. The physiological mechanisms were not explored. These shortcomings should be improved in future studies.

5 Conclusion

1. Family functioning significantly and positively predicts learned helplessness.
2. Action control styles play a fully mediating role between family functioning and learned helplessness.
3. The mediating role of action control style was moderated by individual self-esteem. That is, the negative predictive effect of action control style on learned helplessness was significant for secondary vocational school students in the low self-esteem subgroup and the negative predictive effect of action control style on learned helplessness was diminished but still significant in the high self-esteem subgroup.

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