Regulatory Emotional Self-Efficacy and Test Anxiety: The Mediating Effect of Reappraisal

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【Abstract】 This study investigated the effect of the emotional regulation on test anxiety of high school students. Participants included 757 secondary school students aged 15 to 18 years(M=16.42, SD=1.08). Measures were consisted of the Test Anxiety Scale, the Scale of the Regulatory Emotional Self-efficacy, and Emotion Regulation Questionnaire. Results indicated that test anxiety was not only negatively related with perceived self-efficacy in managing negative affect(NEG), perceived self-efficacy in expressing positive affect(POS), and reappraisal frequency. Meanwhile, there was also a significant positive association of reappraisal frequency with POS and NEG. Additionally, frequency of expressive suppression was negatively correlated with POS, and positively related with NEG. Most importantly, the present study observed that reappraisal partly mediated the relationship between perceived self-efficacy in managing negative affect and test anxiety.

【Key words】 Regulatory emotional self-efficacy; Cognitive reappraisal; Test anxiety

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情绪调节自我效能感对中学生考试焦虑的影响:情绪调节策略的中介作用

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【摘要】 本研究拟从情绪调节策略角度入手,探讨情绪调节效能感对中学生考试焦虑的影响。研究以年龄15~18岁(M=16.42,SD=1.08)之间的757名中学生为研究对象,采用考试焦虑量表、情绪调节自我效能感量表以及情绪调节策略量表,探讨了情绪调节自我效能感、情绪调节策略(认知重评、表达抑制)与考试焦虑三者之间的关系。研究结果发现,中学生考试焦虑与表达积极情绪自我效能感和管理消极情绪自我效能感之间呈显著负相关,与认知重评策略使用频率之间呈显著负相关;中学生认知重评策略使用频率与表达积极情绪自我效能感和管理消极情绪自我效能感之间呈显著正相关;中学生表达抑制策略使用频率与表达积极情绪自我效能感呈显著负相关,与管理消极情绪自我效能感呈显著正相关;中学生认知重评策略在管理消极情绪自我效能感与考试焦虑之间起部分中介作用。

【关键词】 情绪调节效能感; 认知重评; 考试焦虑

1 Introduction

In general, test anxiety is regarded as a consequence of a poor learning state and testing skills (Naveh-Benjamin, McKeachie, Lin, & Holinger, 1981; Nelson, Lindstrom, & Foels, 2014), while also referring to negative feelings individuals generate when in a testing situation. These feelings can include stress, depression, fear, anxiety, and so on(Dan, Bar Ilan, & Kurman, 2013; Putwain, Woods, & Symes, 2010; Spielberger & Vagg, 1995). In addition, test anxiety is often accompanied by several physiological responses(Dan et al., 2013; Sena, Lowe, & Lee, 2007).

Several studies have found that even if students have high learning motivation, performance capabilities while under stress is usually below their competence level(Beilock, 2008; Ramirez & Beilock, 2011). Moreover, one study found that 61% of high school students had experienced test anxiety several times, and test anxiety had a significant negative impact on students' test performance(Bradley et al., 2007; Bradley et al., 2010). Another study showed that students' test anxiety increased once they entered elementary school, with anxiety peaking during high school, followed by a downward trend(Hill & Sarason, 1966; Peleg-Popko,

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2004; Wigfield & Eccles, 1992). If a student is experiencing test anxiety over extended periods, his/her learning scores will likely decrease(Eum & Rice, 2011; Segool, Carlson, Goforth, Von Der Embse, & Barterian, 2013). Furthermore, rates of students choosing to drop out of school are very closely correlated with test anxiety(Lowe, 2014; Yousefi, 2012; Wild, Hofer, Pekrun, 2006).

Test anxiety is influenced by various factors, including teacher-student relationships(Bembenutty, 2009; Dan et al., 2013; Goetz, Preckel, Zeidner, & Schleyer, 2008; Hancock, 2001), parental pressure (Dan et al., 2013; Lowe et al., 2008; Lowe & Lee, 2008), personality characteristics(Lowe et al., 2008), achievement motivation(Stoeber, Feast, & Hayward, 2009; Zeidner, 1998), and self-esteem(Pekrun, 2000). However, recent studies have argued that individual differences in emotion regulation might also impact test anxiety. Emotion regulation is a set of processes by which people consciously or unconsciously change/modulate their emotional experience(Gyurak, Goodkind, Kramer, Miller, & Levenson, 2012). Cognitive reappraisal and expressive suppression are two widely used emotion regulation strategies(John, Gross, & Gross, 2007). Cognitive reappraisal is regarded as an antecedent-focused emotion regulation strategy that refers to people trying to change their understanding and evaluation of an emotional situation. In contrast, expressive suppression is a response-focused emotion regulation strategy whereby people adjust their emotional experience by suppressing the expression of that emotional state(Gross & John, 2003). Generally, individuals with stronger emotion regulation self-efficacy are more likely to use effective and positive emotion regulation strategies(Caprara et al., 2008). Regulatory emotional self-efficacy is measured by determining whether an individual is confident in his/her ability to effectively regulate his/her emotional states(Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). Additionally, some researchers believe there is large variability in individuals' abilities to manage their emotional experience, and regulatory emotional self-efficacy plays a significant role in this variability(Caprara et al., 2008).

In the past decade, research has demonstrated that test anxiety is an adverse emotional reaction given that people are likely over-concerned with potential failure on examinations(Spielberger, 1980). Traditionally, when a student's motivation does not match the prevailing situation, he/she will engage in a cognitive appraisal to change his/her understanding of the test. This is done as a way to regulate any emotional reactions. Thus, test anxiety is viewed as the tension that accompanies a student's use of cognitive reappraisal (Sarason, 1980). Similarly, when students with test anxiety need to think about the exam, concerns over grades might lead to negative perceptions of the test. This thought process likely interferes with effectively completing the test, thereby reducing test scores. In contrast, when faced with an examination, individuals with low test anxiety are likely less affected by these negative thought patterns, which helps their chances of achieving a good grade(Sarason, 1990). In addition, a previous study indicated that fear of failure and test anxiety were positively correlated(Hagtvet & Benson, 1997; Hewitt & Flett, 2004; Mills & Blankstein, 2000; Stoeber, Feast, & Hayward, 2009).

Given the aforementioned evidence, the present study predicted a relationship between test anxiety and reappraisal frequency. Specifically, those students with higher regulatory emotion self-efficacy are likely to be more habitual in adopting reappraisal to regulate negative emotions generated by an exam scenario. Thus, students with high regulatory emotion self-efficacy will more frequently use reappraisal to diminish test anxiety. Furthermore, reappraisal will likely mediate the relationship between regulatory emotional self-efficacy and test anxiety.

2 Methods

2.1 Participants

Participants were high school students from Zhangye City, Gansu Province in China, a total of 1000 questionnaires(757 valid questionnaires) were collected. Among respondents, ages ranged from 15 to 18 years(M=16.42, SD=1.08). Of those, 364 were boys, accounting for 48.1%; 393 were girls, accounting for 51.9%. In total, academic grade breakdown was as fol-

lows: senior one accounts for 49.3%, 373 people; senior two accounts for 29.3%, 222 people; and senior three accounts for 21.4%, 162 people.

2.2 Instrumentation

2.2.1 Emotion Regulation Questionnaire Cognitive reappraisal and expressive suppression frequency during a student's daily life was assessed with the Emotion Regulation Questionnaire(Gross & John, 2003). The scale is divided into two dimensions: the reappraisal frequency scale includes 6 items, and the suppression frequency scale includes 4 items(Gyurak, Gross, & Etkin, 2011). Items are assessed on a 7-point Likert scale ranging from 1 "strongly disagree" to 7 "strongly agree." Higher scores indicate a higher frequency in using a particular emotion regulation strategy. A previous study indicated that the Chinese version of this scale has good reliability and validity(Wang, Liu, Li, & Dou, 2007). For the current sample, alpha reliability was .721 for the scale, and alpha reliabilities were .764 and .721 for the reappraisal and suppression scales, respectively.

2.2.2 The Regulatory Emotional Self-Efficacy scale To measure perceived self-efficacy in expressing positive affect(POS) and perceived self-efficacy in managing negative affect(NEG), participants completed the 17-item Scale of Regulatory Emotional Self-Efficacy (Caprara et al., 2008). The positive subscale(POS) includes 6 items and the negative subscale(NEG) includes 11 items. The Chinese version of this scale has good reliability and validity(Wang, Dou, & Liu, 2013). Participants rated their feelings on a 5-point Likert scale ranging from 1 "not at all agree" to 5 "very much agree." Higher scores indicate higher regulatory emotional self-efficacy. For the current study, the total scale's alpha reliability was .80, and alpha reliabilities were .718 and .801 for the POS and NEG subscales, respectively.

2.2.3 Test Anxiety Scale Participants completed the 37-item Test Anxiety Scale, which is used worldwide. Participants answered questions on a binary scare with 0="Yes" and 1="No" based on how often they felt test anxiety. Higher scores indicate higher test anxiety (Sarason, 1978). The Chinese version of the Test Anxiety Scale has good reliability and validity (Wang, 2001). Alpha reliability for the present sample was 0.737.

2.3 Procedure

Participants used paper and pencil to complete the questionnaires. All questionnaires were completed in a quiet environment.

2.4 Data Analysis

Statistical analyses were conducted with SPSS 16.0 software, Amos 17.0 software and Bootstrap program. The mediating effect of emotion regulation was analyzed using the inspection approach of an intermediary effect(Wen, Zhang, Hou, & Liu, 2004). We utilize the Structural Balance and Factor Analysis to pack the items(Landis, Beal, & Tesluk, 2000).

3 Results

3.1 Correlations between regulatory emotional self-efficacy, emotion regulation strategy, and test anxiety

Students' test anxiety was negatively related to POS and NEG. Test anxiety was also negatively related to cognitive reappraisal. The frequency of reappraisal was positively related to POS and NEG, while suppression frequency was negatively related to POS and positively related to NEG(see Table 1).

Since there is no significant relationship between suppression and test anxiety, and test anxiety was significantly related to cognitive reappraisal and regulatory emotional self-efficacy, we conducted an mediating effect test for cognitive reappraisal and other variables. To analyze the mediating effect of cognitive reappraisal between regulatory emotional self-efficacy and test anxiety, we build two intermediary models among POS, NEG and test anxiety. First at all, we pack the items in each scale in order to control the measurement error from the instability of scale and potential variables. For example, as for a single dimension scale, Test Anxiety Scale is dealt with items-random oriented combined method that randomly allocated to questions of each project team, and finally packed into three project teams scale(Landis, Beal, & Tesluk, 2000). Secondly, adapting Structural balance method to handle the subscale POS and NEG, we use factor analysis: the title descending order according to load size, and then arrangement successively based on the number of teams. Final-

ly, the POS, NEG and reappraisal subscale are packaged into two teams (Landis, Beal, & Tesluk, 2000), of those, the cognitive reappraisal scale projects are packaged into two teams by using content-oriented method (Little, Cunningham, Shahar, & Widaman, 2002; Schau, Stevens, Dauphinee, & Del Vecchio, 1995).

Table 1 Pearson correlations among regulatory emotional self-efficacy, emotion regulation strategy, and test anxiety(n=757)

	Test anxiety	Cognitive reappraisal	Expression suppression	POS	NEG
Test anxiety	1				
Cognitive reappraisal	−0.189**	1			
Expression suppression	0.049	0.100**	1		
POS	−0.102**	0.249**	−0.183**	1	
NEG	−0.381**	0.308**	0.184**	0.141**	1

Note: *P<0.05, **P<0.01, ***P<0.001

Table 2 The roadmap and fit index of model structure of reappraisal between POS and test anxiety

The fit index of model	χ^2	df	χ^2/df	GFI	CFI	AGFI	RMSEA
POS	21.25	11	1.93	0.992	0.993	0.979	0.035
POS → Reappraisal	Reappraisal → Test anxiety			POS → Test anxiety			
0.33***	−0.26***			0.041			

Note: *P<0.05, **P<0.01, ***P<0.001

3.2 The roadmap and fit index of model structure of reappraisal between POS and test anxiety

Through analytical modeling and model comparisons, we can know the fit index of model structure of reappraisal between POS and test anxiety. That is to say, the strategy of cognitive reappraisal has effect on students' test anxiety by POS. In further data analyses, we adopt Bootstrap program in AMOS software to test the significant level of mediator. In first step, a random Bootstrap sample of 1000 was picked up from the raw data(n=757), the capacity of each sample was 30% of the original sample size(n=227). The each path coefficients of generated 1000 paths was preserved. In second step, according to the results of 1000 operations, the average path coefficient of the mediating effect was shown. If the confidence interval of 95% in the average path coefficient does not include zero, then it indicate the mediating effect is significant(Shrout & Bolger, 2002).

The result shows that, the path coefficient between POS and test anxiety was not significant(P>0.05; see Table 2). Therefore, we terminate the mediating effect analysis of reappraisal between POS and test anxiety(Shrout & Bolger, 2002). The above analysis showed that cognitive reappraisal strategy is not a mediator between POS and test anxiety.

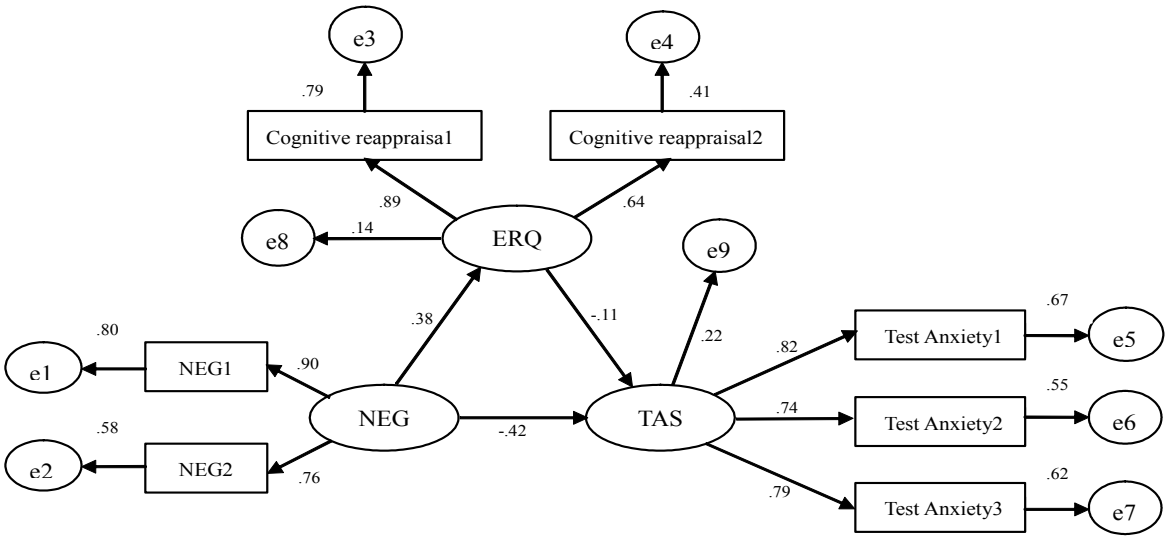

Figure 1 The model picture of the mediating of reappraisal between NEG and test anxiety

Table 3 The roadmap and fit index of model structure of reappraisal between NEG and test anxiety

The fit index of model	χ^2	df	χ^2/df	GFI	CFI	AGFI	RMSEA
NEG	25.3	11	2.3	0.991	0.992	0.976	0.042
NEG→Reappraisal	Reappraisal→Test anxiety					NEG→Test anxiety	
0.38***	−0.11*					−0.42***	

Note: *P<0.05, **P<0.01, ***P<0.001

3.3 The roadmap and fit index of model structure of reappraisal between NEG and test anxiety

Through analytical modeling and model comparisons(see Table 3; Figure 1), we gain the ideal fit index of model. Due to only part of the hypothesis was proved in this model, we need to further analyze the significant test of the mediating effect of reappraisal. That is to say, the strategy of cognitive reappraisal has effect on students' test anxiety by NEG.

In further data analyses, we adopt Bootstrap program in AMOS software to test the significant level of mediator. We can see the standardized estimates and standard errors using the Bootstrap method, it is important that 95% confidence interval of cognitive reappraisal(−0.087, −0.006) did not include 0, which indicates that reappraisal play a significant mediating role in NEG and test anxiety. These results show that NEG can negatively predict the test anxiety(P<0.001), meanwhile, NEG can positively predict the reappraisal(P< 0.001). When NEG and reappraisal predict test anxiety simultaneously, the prediction is more siginficant(P< 0.001). Other result show that standardized direct effects and indirect effects of NEG both are significant for test anxiety. Thus, cognitive reappraisal partially mediated the relationship between NEG and test anxiety.

4 Discussion

The current study examined the relationship between regulatory emotional self−efficacy, emotion regulation strategies(cognitive reappraisal and expression suppression), and test anxiety. Results revealed, consistent with previous research(Caprara et al., 2008), students' test anxiety was significantly negatively related to POS and NEG. Test anxiety tends to be associated with stress, depression, anxiety, and other negative emotions(Putwain et al., 2010; Spielberger & Vagg, 1995). In addition, previous studies on regulatory emotional self−efficacy suggest that individual differences in emotional experience are correlated with regulatory emotional self−efficacy(Caprara et al., 2008), whereby individuals with higher regulatory emotional self−efficacy are better at regulating their negative emotional experience during an exam.

The present study also found a negative correlation between test anxiety and cognitive reappraisal. Cognitive reappraisal is considered an effective emotion regulation strategy(Boden, Gross, Babson, & Bonn−Miller, 2013; Caprara et al., 2008; Gross & John, 2003; John et al., 2007; Miu, Vulturar, Chiş, Ungureanu, & Gross, 2013), and people who often use cognitive reappraisal feel less depressed(Gross & John, 2003), social anxiety(Boden et al., 2012; Miu et al., 2013), other negative emotions, benefit from, higher positive emotional experiences(Gross & John, 2003; John et al., 2007), and report higher subjective well−being(McRae et al., 2012). Some researchers have assessed the influence of cognitive appraisal during a testing scenario(Hagtvet & Benson, 1997; Hewitt & Flett, 2004; Mills & Blankstein, 2000; Stoeber et al., 2009), and they believe there is a close relationship between test anxiety and recognition evaluation. We also found that cognitive reappraisal frequency was significantly positively related to POS and NEG among high school students, which is consistent with previous studies(Caprara et al., 2008). People with high regulatory emotional self− efficacy tend to adopt strongly effective and positive approaches to emotion regulation. However, we have observed that frequency of expressive suppression was significantly negatively correlated with POS and significantly positively correlated with NEG. These results suggest that individuals with stronger NEG are more habituated to using expressive suppression, while those with stronger POS are not. As expressive suppression is a strategy that involves hiding currently manifesting emotions (Gross & John, 2003; John et al., 2007), people who have stronger POS do not engage in such strategies. They are more likely to experience or express their positive emotions(Caprara et al., 2008). Most importantly, the current study observed partial mediating effects of reappraisal on the relationship between test anxiety and NEG. In other words, during an exam scenario, individuals with higher NEG who are not disappointed or discouraged, but have high confidence when coping with exam stress, tend to use cognitive reappraisal(Caprara et al., 2008) to reduce test anxiety.

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