

Cognitive Reevaluation Ability and Subjective Well-Being: A Mediation Model

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Abstract—The purposes of the present study is to explore the relationship between cognitive reevaluation ability, emotional self-efficacy, the meaning in life and subjective well-being as well as the mechanism the effect of cognitive reevaluation ability on subjective well-being of college students. A total sample of 1000 college students from some universities was selected, and be asked to answer questionnaires. The questionnaires included the Emotion Regulation Questionnaire (ERQ), the Subjective Well-being (SWB), the Regulatory Emotional Self-Efficacy (RES) and the Meaning in life Questionnaire of China (C-MLQ). The results show that: 1) The relationships between each pair of cognitive reevaluation ability, emotional self-efficacy, the meaning in life and subjective well-being are correlated significantly and positively. 2) Cognitive reevaluation ability has a significant direct effect on subjective well-being; cognitive reevaluation ability has a significant direct effect on emotional self-efficacy; cognitive reevaluation ability has a significant direct effect on the meaning in life; emotional self-efficacy has a significant direct effect on subjective well-being; the meaning in life has a significant direct effect on subjective well-being. 3) Emotional self-efficacy moderates the relation between cognitive reevaluation ability and subjective well-being of college students, that is, there is a significant positive relation between cognitive reevaluation ability and subjective well-being under the high emotional self-efficacy. And the meaning in life moderates the relation between cognitive reevaluation ability and subjective well-being of college students, that is, there is a significant positive relation between cognitive reevaluation ability and Subjective well-being under the high the meaning in Life.

Index Terms—Cognitive reevaluation ability, emotional self-efficacy, subjective well-being, the meaning in life, mediating effect.

I. INTRODUCTION

Subjective well-being is a comprehensive evaluation of an individual's quality of life made on their own according to internal standards [1]. It is not only an important measure of mental health [2] but also a major psychological indicator of social harmony [3]. However, even though it played such an important role, research results show that, in recent years, the subjective well-being of Chinese college students has declined by years [4], [5].

But what has caused the decline in the subjective well-being of Chinese college students?

Cognitive reappraisal is one of the main strategies of emotion regulation, and is defined by the researchers as “the

strategy that individuals use to regulate emotion by changing the way one thinks of or endows personal meaning to emotional events.” Previous studies have shown that cognitive reappraisal may be an important factor affecting individual subjective well-being [6], [7]. Not only is there a significant positive correlation between the two [6], [7], in their research, Chai Xiaoyun *et al.* also proved that cognitive reappraisal ability has a positive predictive effect on subjective well-being [8]. In other words, the more proficient an individual is to use their cognitive reappraisal ability, the higher their subjective well-being level. This paper will further verify Hypothesis H₁, which is that cognitive reappraisal has a positive predictive effect on subjective well-being.

Researchers such as Bandura pointed out that self-efficacy promotes individual psychological and behavioral changes [9]. Regulatory emotional self-efficacy refers to the degree of individual confidence in whether they can effectively regulate their own emotional state, and it is essentially a sense of self-confidence based on subjective evaluation. Numerous studies have shown that high regulatory emotional self-efficacy can not only relieve tension and impulse, but also increase positive emotional experience and thus improve subjective well-being [10]-[14]. At the same time, people tend to utilize their advantages, and individuals with strong cognitive reappraisal ability are more inclined to use this strategy; those who actively regulate their emotions have a higher regulatory emotional self-efficacy. Therefore, based on the above two points, this paper proposes Hypothesis H₂, which is that regulatory emotional self-efficacy plays a mediating role in the relationship between cognitive reappraisal ability and individual subjective well-being.

The meaning of life refers to the individual's perception and awareness of the nature of human beings and their own existence, as well as what they consider to be more important [15], including the presence of meaning in life and the search for meaning in life. The presence of meaning in life is the degree of an individual's feeling about whether their life is meaningful, and the search for meaning in life is the degree of an individual's active search for meaning in life [16]. On the one hand, the meaning-making model believes that individuals constantly revise their definition for the meaning in life through repeated cognition, comparison, and evaluation of situations and past experiences [17], [18], and cognitive therapy repeatedly verified its belief [16]. On the other hand, the empirical research result shows that an individual's subjective well-being can be positively predicted by their meaning in life [19]-[21], and cognitive reappraisals have a positive predictive effect on the meaning of life [22]. Therefore, this paper proposes Hypothesis H₃, which is that the meaning of life has a mediating role in the relationship

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between cognitive reappraisal ability and an individual's subjective well-being. See Fig. 1 for the model hypothesis.

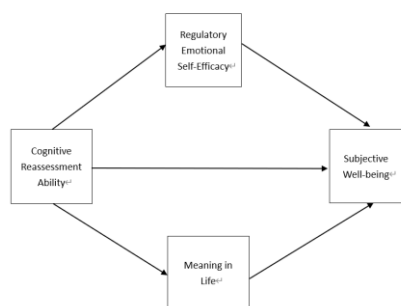


Fig. 1. Hypothetical model of the mechanism of the effect of cognitive reappraisal ability on subjective well-being.

II. SUBJECT AND METHODOLOGY

A. Subjects

The study is conducted with undergraduate students from a university each in Harbin and Inner Mongolia as the subjects, using the class as a unit to conduct intensive measurement. A total of 451 questionnaires were collected, and 381 of them were valid with a validity rate of 85%. The gender ratio is 50%, with 191 boys and 190 girls, and the average age is 19.76 years old. There are 325 Han people, and 56 others are of minority ethnicities, respectively accounting for 85% and 14.7% of all the subjects. 236 of the subjects are the only child of their family, whereas the other 144 subjects are not, respectively accounting for 62% and 38% of all the subjects.

B. Tools

1) The scale of subjective well-being

The subjective well-being scale is used to measure individuals' subjective well-being, and it consists of Campbell's Index of Well-being, Bradburn's Affect Balance Scale [23], and Diener's Satisfaction with Life Scale [24]. The higher the score, the stronger the individual's subjective well-being. There are 24 questions in the questionnaire, and a different number of questions were selected from the measurements. Five questions are selected from the Satisfaction with Life Scale, using a seven-point scale from strongly disagree to strongly agree. Nine questions are selected from the Index of Well-being, and a seven-point scale is used to indicate the gradual transition of the negative emotions on the left to the positive emotions on the right in the first eight questions, and, in the ninth question, to indicate the general satisfaction with life, from very dissatisfied to very satisfied. Whereas the remaining 10 questions are from the Affect Balance Scale, five questions each for positive and negative affect. The subjects are required to answer the questions with "Yes" or "No". The internal consistency coefficient of the total scale is 0.81, and the internal consistency coefficients of the three scales are between 0.77 and 0.87.

2) The scale of regulatory emotional self-efficacy

Using Caprara's Scale of Regulatory Emotional Self-efficacy [25], and its Chinese version revised by Wang Yujie *et al.* [26], this scale is used to measure the

self-confidence of individuals in regulating their own emotions. The higher the score of the subject, the higher the individual's regulatory emotional self-efficacy. There are two factors in this scale: self-efficacy to express positive emotions and self-efficacy to manage negative emotions. Among them, the self-efficacy that expresses positive emotions includes self-efficacy in expressing happiness and excitement (HAP) and self-efficacy in expressing glory (GLO), whereas the self-efficacy in managing negative emotions includes self-efficacy in managing anger and rage (ANG), self-efficacy in managing depression and pain (DES), and self-efficacy in managing compunction and shame (COM). There are a total of 17 items, using a five-point scale from being inapplicable at all to very applicable. The internal consistency coefficient of the total scale is 0.82, and the internal consistency coefficients of the five dimensions are between 0.66 and 0.78.

3) Emotion regulation questionnaire

This study utilizes Gross's Emotion Regulation Questionnaire [27], and its Chinese version revised by Zhao Xin *et al.* [28]. This questionnaire consists of 13 questions, and is divided into two sub-questions, which are cognitive reappraisal and expression suppression. In this study, sub-questions for the cognitive reappraisal are selected, with a total of 6 items, and a five-point scale ranging from 1 (never before) to 5 (always). The internal consistency coefficient of this sub-questionnaire is 0.80.

4) The meaning in life questionnaire of China

This study utilizes the meaning in life questionnaire compiled by Steger *et al.* [15], and its Chinese version revised by Wang Mengcheng and Dai Xiaoyang [29]. There are a total of nine questions in the meaning in life questionnaire of China, which can be divided into the presence of meaning in life and the search for meaning in life. It adopts a seven-point score from being absolutely untrue to being absolutely true. The internal consistency coefficient of the entire questionnaire is 0.87, whereas the internal consistency coefficients of the two elements are 0.88 and 0.87.

C. Statistical Approaches

Descriptive statistics and correlation analysis were performed on data through SPSS 23.0, and the bootstrap method (5,000 times) was applied to test the model through Mplus 7.0.

III. RESULTS AND ANALYSIS

There are pairwise positive correlations between cognitive reappraisal ability, subjective well-being, regulatory emotional self-efficacy, and meaning in life. See Table I for the means and standard deviations.

Taking these demographic variables such as age, gender, grade in school, ethnicity, and whether the subject is an only child or not as covariates into the confirmatory factor analysis model (CFA), this research examines the effects of demographic variables on various psychological values. The result showed that as the grade increases, there is a gradual declining trend in the subjects' subjective well-being ($r=-0.03$ $P=0.007$) and their cognitive reappraisal ability

($r=-0.14$ $P=0.003$). Compared with females, males have higher cognitive reappraisal ability ($r=0.48$ $P=0.000$) and the perception of meaning in life ($r=0.17$ $P=0.010$). While compared with minority students, Han students have a higher cognitive reappraisal ability ($r=0.39$ $P=0.001$) and regulatory emotional self-efficacy ($r=0.09$ $P=0.034$). Cognitive reappraisal ability, subjective well-being, regulatory emotional self-efficacy, and the perception of meaning in life are not affected by age and whether the subject is an only child.

TABLE I: MEAN, STANDARD DEVIATION, AND ONE-WAY ANOVA FOR EACH VARIABLE

variable	1	2	3	4
1CRA	1	0.55**	0.32**	0.35**
2EASE	0.55**	1	0.38**	0.55**
3MLQ	0.32**	0.38**	1	0.34**
4SWB	0.35**	0.55**	0.34**	1
M	21.02	55.35	46.86	75.48
SD	4.37	8.70	8.65	12.39

**. Significant correlation at the 0.01 level (two-tailed).

After controlling demographic variables such as age and gender, the model fit is evaluated, and the results are acceptable, which are $\chi^2=235.44$, $df=50$, $\chi^2/df = 4.70$, CFI = 0.86, TLI = 0.79, RMSEA = 0.09, SRMR=0.05. It is then tested according to the mediating effect test procedure and the deviation-corrected nonparametric percentile Bootstrap method proposed by Wen Zhonglin and Ye Baojuan [30]. Figure 2 and Table 2 demonstrate that the direct effect of cognitive reappraisal ability on subjective well-being is not significant after adding the mediating variables ($r=0.26$). Regulatory emotional self-efficacy plays a fully mediating role between cognitive reappraisal ability and subjective well-being ($r_{a1b1}=0.67$, $p<0.05$), while meaning in life also has a fully mediating role between cognitive reappraisal ability and subjective well-being ($r_{a2b2}=0.20$, $p<0.05$). On top of that, at the level of 0.01, there are significant differences between the two mediators.

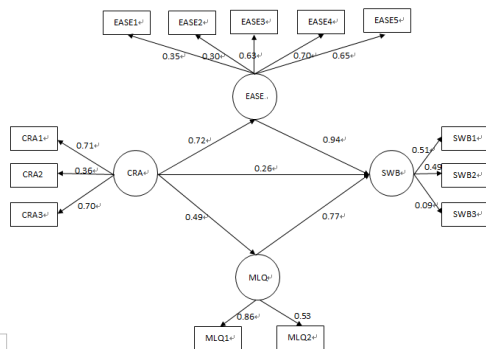


Fig. 2. Diagram of the internal mechanism model of the effect of cognitive reappraisal ability on subjective well-being (standardized).

TABLE II: RESULTS OF SEM ANALYSIS OF MEDIATING EFFECTS

	Point estimate	95% confidence interval		P
		down	up	
a1b1(EASE)	0.67(0.35)	0.32	1.59	<0.05
a2b2(MLQ)	0.20(0.08)	0.08	0.40	<0.05
Total indirect effect	0.87(0.38)	0.49	0.84	<0.05
TEST	-16.86(5.73)	-35.26	-	<0.01
		9.81		

IV. DISCUSSIONS

A. Discussion on the Direct Effect of Cognitive Reappraisal Ability on Subjective Well-Being

The research results show that cognitive reappraisal ability positively predicts subjective well-being, which validates Hypothesis H₁ and is consistent with previous research results [6]-[8]. This explains the source of individual subjective well-being from a cognitive perspective. The subjective well-being of the individual is influenced by the individual's subjective judgment of the environment; a higher cognitive reappraisal ability means that individuals can frequently evaluate the external environment more quickly and automatically, analyze events from multiple angles, and consume less cognitive resources. Therefore, it is easier for these individuals to find the balance between their psychological health and external environment, and have a higher level of subjective well-being. On the contrary, individuals with low cognitive reappraisal ability are more passive in regulating their emotions and treat things more pessimistically. So, they have lower subjective well-being [31], [32]. These results suggest that researchers can improve individual subjective well-being by improving the cognitive reappraisal ability, such as increasing the frequency of using cognitive reappraisal strategies and consciously analyzing problems from multiple perspectives.

B. Discussion on the Mediating Effect of the Regulatory Emotional Self-efficacy

The research results indicate that the regulatory emotional self-efficacy plays a mediating role in the influence mechanism of cognitive reappraisal ability on subjective well-being, which validates Hypothesis H₂. Compared with individuals with weak cognitive reappraisal ability, individuals with strong cognitive reappraisal ability are more likely to successfully regulate emotions according to their own needs, and have a stronger regulatory emotional self-efficacy. At the same time, studies have shown that social adaptation can promote subjective well-being, whereas regulatory emotional self-efficacy can improve social adaptation. Therefore, regulatory emotional self-efficacy can improve subjective well-being [13]. On the contrary, as individuals with weak cognitive reappraisal ability lack confidence in regulating their emotions and tend to play ostrich, they are often unable to positively handle emotions and events, so they have low subjective well-being. These results remind researchers that establishing good emotion regulation beliefs is a feasible solution to improve subjective well-being [10]. Individuals can strengthen their regulatory emotional self-efficacy through direct and indirect experiences.

C. Discussion on the Mediating Effect of the Meaning in Life

The results of this study show that meaning in life plays a mediating role in the influence mechanism of cognitive reappraisal ability on subjective well-being, which proves that Hypothesis H₃ is tenable. Specifically, cognitive reappraisal ability positively predicts meaning in life, and meaning in life positively predicts subjective well-being. This result is consistent with the viewpoint of the construction model of the sense of meaning [17], [18]. The

use of cognitive reappraisal strategies and the construction of the perception of meaning in life are both cyclical cognitive processes, during which individuals constantly adjust their views on things to adapt their internal psychology to changes in the external environment. In the same cognitive process, individuals constantly revise the meaning of their life. Compared with individuals with weak cognitive reappraisal ability, individuals with strong cognitive reappraisal ability believe that they are more useful and unique, so they have a higher meaning in life. Such individuals are more satisfied with themselves and more receptive to changes in the external world, so they have high subjective well-being. On the contrary, individuals with weak cognitive reappraisal ability feel powerless to changes in the external environment and have little perception of their meaning in life, so they have negative coping responses and low subjective well-being. These results imply that researchers can improve subjective well-being by acquiring a clear meaning in life. For college students, engaging in public welfare activities, learning about exemplary experiences of others, participating in academic research, and establishing close relationships are all good ways to gain a sense of meaning in life.

V. CONCLUSIONS

- 1) Cognitive reappraisal ability positively predicts subjective well-being.
- 2) Meaning in life plays a mediating role between cognitive reappraisal ability and subjective well-being.
- 3) Regulatory emotional self-efficacy plays a mediating role between cognitive reappraisal ability and subjective well-being.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

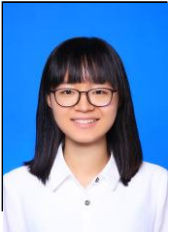
The author conducted the research, analyzed the data, and wrote the paper; the author had approved the final version.

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