

# Influence Factors of College Students' Creativity: The Effect of Self-Esteem and Motivation

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**Abstract:** This study attempted to examine the influence of self-esteem and learning motivation for college students' creativity. Data was obtained from 530 students in 11 schools of 7 cities in China. From the results: (1) self-esteem (self-competence and self-liking) has a significantly positive influence on creativity; (2) IM (internal motivation) and SEM (synergistic external motivation) have significantly positive influences on creativity; (3) IM mediates the relationship between SEM and creativity, IM mediates the relationship between self-competence and creativity; (4) N-SEM (non-synergistic external motivation) moderated the relationship between self-esteem and creativity. When the level of individual self-esteem is higher, the higher N-SEM has a stronger promoting effect on creativity. Thus, self-esteem and motivation both impact on creativity, and constitute a dynamic cycle system of creativity which improving constantly. Implications of this study are further discussed.

**Keywords:** Self-Esteem, Internal Motivation, External Motivation, Creativity

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## 1. Introduction

Creativity is an innovative and effective problem-solving ability [1-2], it is an excellent and effective capacity for college students to solve problems in daily life. Creativity has caught the attention of many scholars because college students are the direct beneficiaries of higher education and the main force of nation-building, under this condition students' comprehensive capabilities, especially creativity is the core force of the national competition in the future. Since 1950, Gilford called for enhancing more research on creative thinking, a large number of scholars have devoted to the study of creativity and its influencing factors. One of the most important studies is the relationship between self-esteem and creativity. As one of the key elements of personality, self-esteem has a close relationship with creativity, but the exact nature of their relationship is still unclear and controversial. Therefore, the first research question is exploring the factual relationship between self-esteem and creativity.

Motivation is the main driving force of individual creative activity [1, 3-5], but different mechanisms of internal

motivation and external motivation lead to different influences on creativity. Especially, the relationship between external motivation and creativity has not been consistently concluded. Thereby, the relationships between internal motivation, external motivation and creativity are one of the major exploring objectives in this research. In addition, motivation and self-esteem have a certain interaction on creativity, apart from their main effects on creativity. [6]. But previous studies had focused only on the whole level of internal motivation and self-esteem, how the different components of motivation and self-esteem interact with creativity will be discussed in further studies. This paper will take a group of college students, synthesize previous research results, explore the relationship between their self-esteem, motivation and creativity, and make an in-depth study of what kind of mechanism it takes to co-influence creativity with different components of self-esteem and motivation.

### 1.1. Self-Esteem and Creativity

#### 1.1.1. Component of Self-Esteem

Previous studies had suggested that self-esteem is

primarily composed of individual competence [7-8]. James first proposed the concept of self-esteem in the *Principles of Psychology*, he suggested that self-esteem was the integration of individual attitudes towards himself/herself [7]. Then James put forward a formula for self-esteem which was  $\text{self-esteem} = \text{success}/\text{expectation}$  in 1890, he considered that self-esteem depended on the ratio of success to success desire. Other researchers suggested from the social aspect of human being that the sense of value was the main component of self-esteem. Rosenberg [9] pointed out that self-esteem was a positive or negative attitude toward individuals themselves. Leary presented the Sociometer Theory of self-esteem from the perspective of relationships [10]. That theory indicated that self-esteem played a role of the relationship meter, a change in self-esteem will encourage individuals to strive to remain in the accepted state of others.

As the basic component of self-esteem is competence or value that still in the debate, Branden argued in psychology of self-esteem: a new concept in the nature of human nature that self-esteem was made up of two interrelated aspects: the sense of competence and the sense of value [11]. Self-esteem was a belief that one has the ability to survive and meaningful or valuable survival. After confirmatory factor analysis of Rosenberg self-esteem scale (SES), Tafarodi found that the projects measured by the Rosenberg self-esteem scale not only focused on the value factor, but also another factor: the sense of competence [12]. Therefore, Tafarodi thought that the structure of self-esteem should include two basic dimensions: self-liking and self-competence, then he developed a new self-esteem scale—the Self-Liking/Self-Competence Scale (SLCS). His follow-up studies also confirmed that self-esteem does consist of two dimensions, which were self-liking and self-competent [13-14]. Then Mruk (2006) analyzed previous concept of self-esteem from the perspective of phenomenology and put forward a comprehensive description, he pointed out that "Self-esteem is a state of ability to cope with life challenges in a valuable way", self-competence and self-liking are two main factors that constitute self-esteem, and the combination of the two factors is particularly important [15].

### 1.1.2. Self-Esteem and Creativity

Most scholars have confidence in that self-esteem is positively associated with creativity [16]. It was suggested that high self-esteem individuals are eager and excited about the challenge; seek capacity development and the greatest development of potential; not afraid of facing selection, decision-making, judgment and action; seek value realization and harmonious interpersonal relationship, these features are conducive to creativity. But low self-esteem individuals are driven by worthless emotions, which are often defeated by anxiety and fear. They are afraid of facing challenges of life, try to avoid selection and decision-making, manifest self-renunciation and self-rejection, thus harmful to creativity [17]. Goldsmith adopted Kirton Adaptor Innovator Inventory (KAI) and found that high self-esteem was highly correlated

with innovative personality and not with adaptive personality [18]. Subsequently, Goldsmith [19] studied the creative motivation scale compiled by Torrance [20], and found that there was a positive correlation between self-esteem and creativity. Cast, & Burke [21] argued that self-esteem was an important psychological resource that acted as a stress buffer for creativity [22-23]. In the direction of the influence of self-esteem and creativity, some scholars believe that high self-esteem individuals have the personality qualities necessary for creativity, such as experience openness, tolerating vague situations, passion, disobedience and free will, so self-esteem has positive impact on creativity. For instance, Wang believed that self-esteem positively predicted creativity, and played a moderate role in self-construction and creativity, which could strengthen the relationship between self-construction and creativity [24]. Other scholars, starting from the concept of self-esteem, suggested that creativity inspired individual's sense of ability and value [25]. Researchers such as Fleith demonstrated that highly creative individuals had a more positive self-concept [26].

However, Torrance [27] and Dowd [28] argued that creativity was negatively correlated with self-esteem. That was because children were required obedience by maturity, culture and important others. But creative children tended to be disobedient, behaved differently [29], therefore, parents would suppress their unique ideas. While self-perception was the reactivity evaluation of important people's evaluation, parental suppression caused children to have difficulty in forming self-concept [30]. It resulted in creative children with fancy ideas had low self-esteem and confidence because of the inhibition. A small group of voices also pointed out that there was no relationship between self-esteem and creativity, and the evidence came from research into the effectiveness of creativity training. Meador [31] and Camp [32] showed that creativity training programs could improve creativity, but not self-concept; training program did not lead to the same or opposite change in self-esteem and creativity.

It is considered that scholars' negative views on self-esteem and creativity are related to empiricism that lacking practice evidence; and the inhibitory effect of mature and culture is strong or weak, the positive effect of self-esteem is still significant when the intervention does not reach the critical level. Zero correlation experimental results come from the study of the effectiveness test of the creativity training for gifted children, training in the absence of control of other variables may result in cover-up of changes in self-esteem; and the training content is creativity, increase of creativity does not mean an immediate improvement in self-esteem, this positive impact of sense of ability should be build up gradually in life by solving problems creatively. Therefore, it is suggested that there is a positive relationship between self-esteem and creativity, and the two predictors are both existing: individual with higher self-esteem will provide the necessary personality conditions for creative activities, which will motivate them to engage in creative behaviors actively; when their creative behaviors and products are recognized, their self-esteem will be enhanced, and the high

self-esteem can inspire them to create and invent, then the circulation model of "creating achievement → self-esteem → creativity" has been formed.

As mentioned above, is there a positive relationship between the two components of self-esteem (self-competence and self-liking) and creativity? Tafarodi [11, 12] harbored the idea that self-competence was related to the assessment of our ability and confidence, which was very similar to "self-efficacy" of Bandura [33] but not quite. Just as the positive impact of self-efficacy on creativity [34-37], self-competence also increases individuals' confidence in their own abilities, have positive relationship with creativity. Self-liking is perception of our value and social identity that based on our desire to be social acceptance [38], it can promote individuals show their ability and value which will be accepted by society through solving problems novelly and effectively. In this sense, there is also a positive relationship between self-love and creativity. Following the above reasons, it is hypothesized:

Hypothesis 1: Self-competence has a positively relationship with creativity.

Hypothesis 2: Self-liking has a positively relationship with creativity.

### 1.2. Motivation and Creativity

In 1983, Amabile deeply studied and explained the motivation, she divided motivation into intrinsic motivation and extrinsic motivation. Referring to the decisive influence of internal motivation on creativity [1, 2, 4, 38, 39], the role of external motivation in creativity was not so promising, suggesting that external motivation hindered creativity [40-41]. However, with the theoretical development of external motivation, people found that external motivation has two aspects: control and information [42]. Amabile identified two types of external motivation: synergistic external motivation (SEM) and non-synergistic external motivation (N-SEM), the former could provide information, or helped individuals perform better, and was consistent with internal motivation; the latter made individuals feel controlled and incongruous with internal motives. "Internal motivation can lead to creativity, and controlling external motivation is harmful to creativity; but the information external motivation can lead to creativity, especially when the initial level of individuals is high [43]." She described two mechanisms to illustrate how the external motivation makes a positive contribution to creativity: a. external motivation served internal motivation—that was, the SEM would support individuals' recognition of their ability or increase commitment to the task—could enhance creativity with high levels of internal motivation. b. "Motivation-work cycle match", different types of motivation had different roles in every process of creativity [43-44]. Based on the theory of Amabile, it is hypothesized:

Hypothesis 3: Intrinsic motivation has a positive relationship with creativity.

Hypothesis 4: Synergistic extrinsic motivation has a positively relationship with creativity, and intrinsic

motivation plays a mediate role between them.

Hypothesis 5: Non-synergistic extrinsic motivation is negatively associated with creativity.

### 1.3. Self-Esteem, Motivation and Creativity

Theoretically, self-esteem is an awareness of individual themselves, have a strong characteristic of need. Maslow also mentioned the "need for self-esteem" in his famous Hierarchical Theory of Needs, and regarded it as a basic human need [45]. Rosenberg described the self-esteem need as "the need to maintain the sense of self-worth on a certain level [46]." A strong self-esteem experience will be generated when individual's competence and value needs are meet. So how does this need relate to individual motivation? The self-determination theory (SDT) [47] summarized three psychological needs of human being adapting to society actively through a large number of empirical studies with a method of induction and deduction: autonomy, competence and relatedness. Autonomous refers to individuals who experience a high degree of autonomy in a certain activity, experience internal attribution, and requires experiencing choice and feeling like the initiator of one's own actions. Competence requires succeeding at optimally challenging tasks and attaining desired outcomes. Relationship requires a sense of mutual respect, caring, and reliance with others [48]. Deci also believed that internal motivation was related to self-competence, competence and autonomy needs could not be used to adequately define internal motivation, but they were necessary for internal motivation and interest [49]. The theory also pointed out that the relationship need was not the most direct factor in maintaining internal motivation like autonomy and competence, but it could provide support for the possibility and stability of internal motivation development [50]. Therefore, it is suggested that self-competence is a necessary factor that influences internal motivation, then influences creativity. There is no direct relationship between self-liking and internal motivation.

Some studies have further proved the effect of self-esteem and intrinsic motivation on creativity. For instance, Prabhu [41] suggested that individuals' confidence in their ability could mobilize their motivation, especially the internal motivation, and proved the mediate effect of internal motivation through investigation. In the study of 236 engineers, Chiang found that internal motivation played a mediating role in their self-esteem and creativity, the relationship between self-esteem and internal motivation reached a significant level [51]. Wang believed that high levels of self-esteem would maintain the high internal motivation of individuals and reduce external motivation, which was essential for creativity [24]. But the above studies took self-esteem as a whole, without discussing the mechanism of different components of self-esteem. According to stated reasons, it is hypothesized:

Hypothesis 6: Intrinsic motivation mediates the relationship between self-competence and creativity. But no

significant effect between self-liking and creativity.

More and more studies have found that external motivation has a positive effect on creativity in certain circumstances [52-55]. For example, Eisenberger and Shanock found that expected monetary rewards can enhance creativity - a specific form of performance - when participants understand the necessity of performing creative actions, either through instructions or prior experience [56]. These results are consistent with the findings by Deci and Ryan [57]. They found that bonuses for acknowledging the work of individuals are very effective when these knowledge workers expect a bonus. Other researchers, like Malik *et al.*, found controversial results: Although rewards in general correlated significantly and positively with creativity, financial rewards showed no significant effect on creativity [58]. Malik *et al.* explained this finding with the lack of salient transactional stimuli [58]. Mehta made series of five studies demonstrated that within the context of creativity contingency, monetary rewards induce a performance focus, while social-recognition rewards induce a normative focus. Such performance (normative) focus in turn enhances (attenuates) approach motivation to be original and hence leads to higher (lower) originality in a creative task. [59]. Such performance (normative) focus in turn enhances (attenuates) approach motivation to be original and hence leads to higher (lower) originality in a creative task.

Therefore, it is suggested that N-SEM may also show positive influences under certain conditions (higher self-competence or intrinsic motivation). The following hypothesis is presented:

Hypothesis 7: N-SEM moderates the relationship between self-esteem and creativity.

#### 1.4. Research Purpose

This paper will synthesize previous research results, explore the relationship between college students' self-esteem, motivation and creativity. And what kind of mechanism it takes to affect creativity between different self-esteem components and different motivations will be deeply studied.

As an important concept of personality, self-esteem is closely related to creativity. The addition of motivational variables is no doubt opened a black window on the relationship between self-esteem and creativity, and makes the process of "creating achievement → self-esteem → creating potential" becomes more fresh and dynamic. There is a model (Figure 1) according to hypothesis 1-7, this model well explains the mechanism of self-esteem, motivation and creativity. College students with higher self-esteem will provide the necessary personality conditions for creative activities, which will motivate individuals to engage in creative behaviors actively; when their creative behaviors and products are recognized, their self-esteem level will be enhanced, and the high self-esteem can inspire them to create and invent. Internal motivation plays a mediating role between self-esteem and creativity. The synergistic components in the external environment influence creativity through intrinsic motivation; the non-synergistic component mediates the relationship between self-esteem and creativity. This is the reason why highly creative individuals can continue to produce innovative products. This dynamic process continues to spiral up, allowing individuals to continually create activities in constant self-esteem meet and motivation moderate.

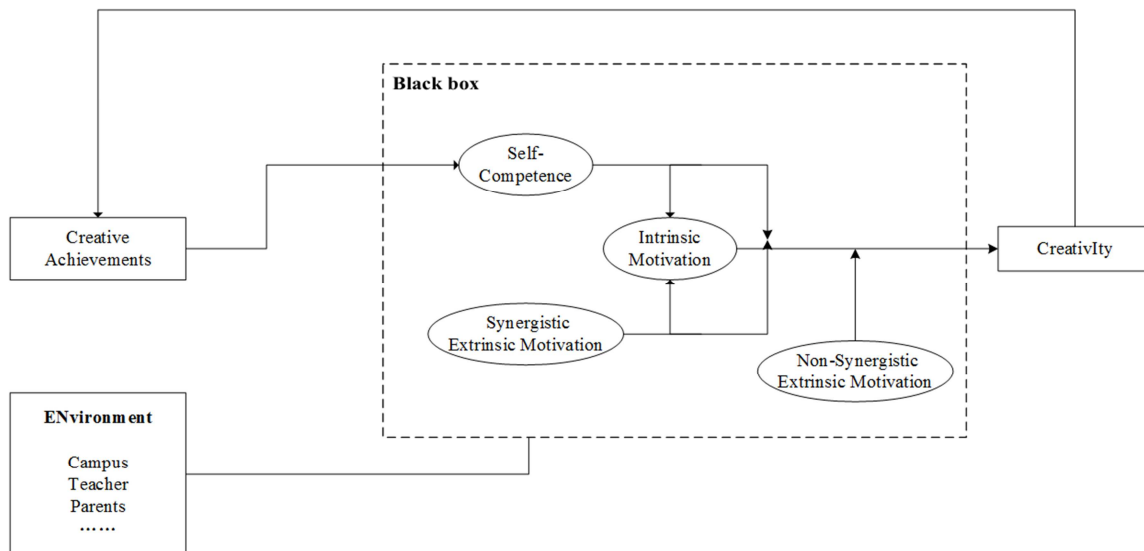


Figure 1. Dynamic circulation system of self-esteem, motivation and creativity.

## 2. Method

### 2.1. Participants and Procedure

The questionnaires used in this study are derived from

mature English scale. First, the research team, proficient in English and Chinese, translated the original questionnaire into Chinese according to Chinese customs. Other members of the team translated the Chinese questionnaire into English, then compared with the original questionnaire and amend it.

Subsequently, network and paper questionnaires were adopted from 11 universities in 7 cities, including 530 students. The effective recovery rate was 97.4%, excluding invalid questionnaires and 516 remaining. The recovery data were recorded in Excel2013. SPSS23.0 and Amos22.0 were used for statistical analysis. Gender, age, grade, origin and school were measured as control variables. The average age of the students was 22 years old and standard deviation 3.20, the proportion of boys is 38.4%. The proportion of undergraduate students in different grades are as followed freshmen 26.2%, sophomore 15.5%, juniors 20.0%, senior 13.8% and fifth-year students (medicine, architecture, etc.) 3.5%, postgraduate students 19.4%, doctoral students 1.7%.

## 2.2. Materials

### 2.2.1. Self-Esteem Scale

Adapted from Swann's Self-Liking/ self-Competence Scale (SLC-R; 1995), consisting of 2 dimensions (self-competence and self-liking) and 8 items. Self-competence dimension (5 items) measures generalized intrinsic self-efficacy, self-liking dimension (3 items) measures the intrinsic sense of self-worth arising from the examination of individuals who regard themselves as social objects and moral objects. Considering the questions involve students' self-abilities and self-worth, in order to eliminate the negative effect of reverse scoring, all the reverse scoring questions in the questionnaire are changed into positive scoring. Such as change "I do not have much to be proud of" to "I have much to be proud of". Subjects were asked to rate from 1 (strongly disagree) -5 (strongly agree), Cronbach's  $\alpha$  was .63.

### 2.2.2. Motivation Scale

Amabile's Work Preference Inventory (WPI; 1994) is considered as one of the most authoritative scales of measurement motivation [60]. In this study, WPI was revised with removing items that do not fit the Chinese context and structural analysis load were less than 0.4, then remaining 11 items. The questionnaire includes two dimensions, internal motivation and external motivation. Internal motivation (4 items), including self-determination, ability, commitment to tasks, curiosity and interest, such as "for me, the most

important thing is to do my favorite job". External motivation is divided into two parts: SEM (4 items) includes others' recognition and feedback, wish for praise, etc., such as "I hope others discover how well my academic studies are"; N-SEM (3 items) includes being controlled by others, controlling competition, wish for returns, etc. such as "I'm more concerned with what I get from it but what I do". Questionnaire scores from 1 (strongly disagree) -5 (strongly agree). Cronbach's  $\alpha$  was .65 for intrinsic motivation, .70 for SEM and .70 for N-SEM.

### 2.2.3. Creativity Scale

This questionnaire was adapted from the 9-item Work Innovation Behavior scale (WIB) developed by Janssen [61]. This study used the dynamic definition of Shalley [62] which defined creativity as the process of using new methods or ideas to solve challenging problems during aims achieving, rather than used the classic definition of Amabile [1] which hold the view that regarded creativity as an innovative and valuable idea. This process covers three stages: idea generation, idea promotion and idea realization, each stage has three items. Questionnaire scores from 1 (strongly disagree) -5 (strongly agree). Cronbach's  $\alpha$  was .71 for idea generation, .74 for idea promotion and .75 for idea realization.

## 3. Results

Table 1 displays the means, standard deviations, and bivariate correlations for all study variables. Creativity is positively correlated with internal motivation ( $r=.437$ ,  $p<0.001$ ), SEM ( $r=.256$ ,  $p<0.001$ ) and self-competence ( $r=.361$ ,  $p<0.001$ ), and has a weak positive correlation with self-liking ( $r=.099$ ,  $p<0.05$ ). Secondly, in addition to creativity, internal motivation only has significant positive association with SEM ( $r=.128$ ,  $p<0.001$ ) and self-competence ( $r=.256$ ,  $p<0.001$ ). There are also significant positive correlations between SEM and self-competence ( $r=.110$ ,  $p<0.01$ ). Correlation between N-SEM and other variables are not significant. Therefore, hypothesis 1, 2, 3 and 5 are validated, hypothesis 4 is partially validated.

Table 1. Means, Standard Deviations and Correlations for the Main Study Variables.

Variables	M $\pm$ SD	1	2	3	4	5
1 IM	3.92 $\pm$ .53	—				
2 SEM	3.53 $\pm$ .66	.128***	—			
3 N-SEM	3.28 $\pm$ .64	-.020	.010	—		
4 S-C	3.27 $\pm$ .56	.256***	.110**	-.033	—	
5 S-L	3.45 $\pm$ .64	.034	.108	.045	.196***	—
6 creativity	3.26 $\pm$ .60	.437***	.256***	.009	.361***	.099*

Note. \* $p<0.05$ . \*\* $p<0.01$ . \*\*\* $p<0.001$ .

### 3.1. Self-Esteem, Synergistic External Motivation and Creativity—The Mediating Effect of Internal Motivation

Continuing to explore the internal relations between

creativity, self-esteem and motivation in figure 1, this study explores the path correlations between variables using structural equation modeling. The results are shown in figure 2. In this figure, intrinsic motivation respectively mediates on

self-competence & creativity and SEM & creativity. Hypothesis 4 and 6 are verified.

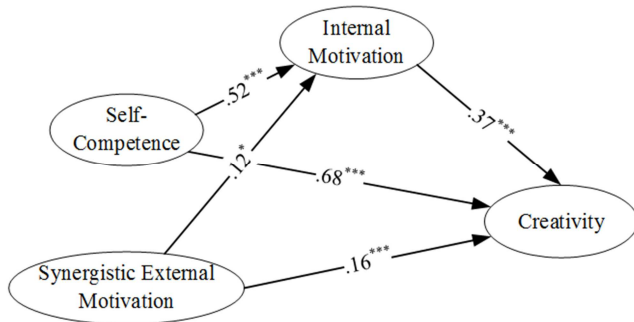


Figure 2. SEM results of the proposed research model.

Note.  $\chi^2/df=1.78$ , CFI = 0.94; GFI = 0.93; NFI = 0.87; RMSEA = 0.04.

b \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < 0.001$ .

### 3.2. The Moderating Effect of Non-synergistic External Motivation

In order to verify the moderating effect of external motivation, the author used the hierarchical regression method of Aiken and West to make the variables decentralized [63]. The first step is to integrate the control variables into the regression equation; the second step takes the main influence variables into the regression equation; and the third step takes the product of the interaction variables into the regression equation. Table 2 and 3 display the results, they show that N-SEM plays a moderate role between self-competence and creativity ( $\beta=.39$ ,  $\Delta R^2=.14$ ,  $p<0.001$ ); and self-liking and creativity ( $\beta=.124$ ,  $\Delta R^2=.019$ ,  $p<0.01$ ). But SEM doesn't (self-competence:  $\beta=-.045$ ,  $\Delta R^2=.002$ ,  $p>0.05$ ; self-liking:  $\beta=.019$ ,  $\Delta R^2=.000$ ,  $p>0.05$ ). Hypothesis 7 is verified.

Table 2. Interaction effect of self-competence and non-synergistic extrinsic motivation on creativity.

Variable	Step1		Step2		Step3	
	B(SE)	$\beta$	B(SE)	$\beta$	B(SE)	$\beta$
Gender	-0.236(.08) **	-0.124**	-0.148(.08)	-0.078	-0.157(.07) *	-0.082*
Grade	0.032(.02)	0.06	0.017(.02)	0.032	0.01(.02)	0.018
Origin	-0.045(.04)	-0.052	-0.014(.04)	-0.016	-0.035(.03)	-0.04
School Type	0.001(.05)	0.001	0.011(.04)	0.01	-0.001(.04)	-0.001
N-SEM			0.037(.04)	0.037	-0.029(.04)	-0.029
S-C			0.376(.04) ***	0.376***	0.283(.04) ***	0.283***
S-C×N-SEM					0.343(.03) ***	0.39***
$R^2$	.023*		.161***		.300***	
$\Delta R^2$	.023***		.138***		.138***	
F for $\Delta R^2$	3.017		41.918		100.425	

Notes. \*  $p < .05$ . \*\* $p < .01$ . \*\*\* $p < 0.001$ .

<sup>b</sup> S-C is short for self-competence.

Table 3. Interaction effect of self-liking and non-synergistic extrinsic motivation on creativity.

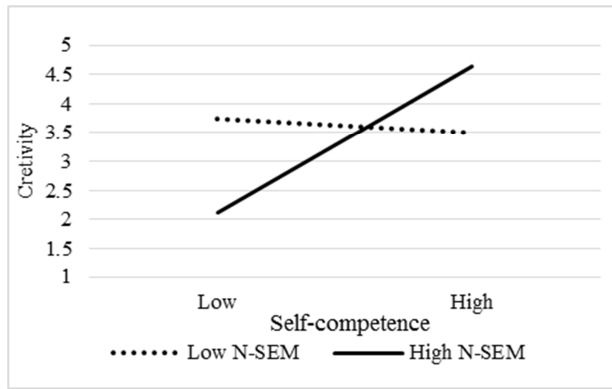
Variable	Step1		Step2		Step3	
	B(SE)	$\beta$	B(SE)	$\beta$	B(SE)	$\beta$
Gender	-0.236(.08) **	-0.124**	-0.21(.08) *	-.110*	-0.19(.08) *	-.102*
Grade	0.032(.02)	0.06	0.03(.02)	0.056	0.03(.02)	0.05
Origin	-0.045(.04)	-0.052	-0.05(.04)	-0.051	-0.04(.08)	-0.046
School Type	0.001(.05)	0.001	0.00(.05)	0	-0.001(.04)	-0.001
N-SEM			0.03(.04)	0.028	-0.03(.04)	0.025
S-L			0.12(.04) **	.117**	0.11(.04) *	.106*
S-L×N-SEM					0.13(.04) **	.138**
$R^2$	.023*		.038*		.057**	
$\Delta R^2$	.023*		.015*		.019**	
F for $\Delta R^2$	3.017		3.86		10.158	

Notes. \*  $p < .05$ . \*\* $p < .01$ . \*\*\* $p < 0.001$ .

<sup>b</sup> S-L is short for self-liking.

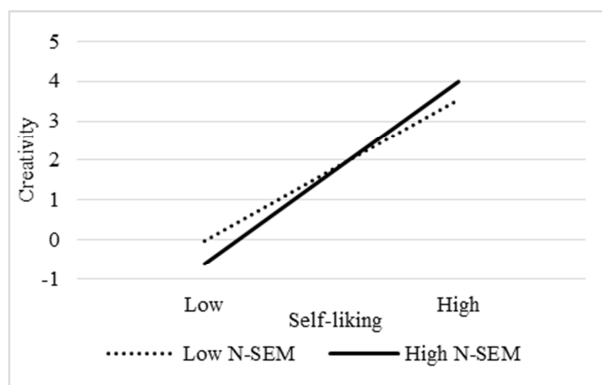
For further analysis of the moderating effect direction of N-SEM, simple slopes tests were then conducted. As shown in figure 5, self-competence relates more positively to creativity when N-SEM is higher rather than when N-SEM is lower. Similarly, figure 6 shows the same trend like figure 5,

therefore, N-SEM is more conducive to creativity in the case of higher self-liking. In conclusion, the higher the self-esteem of college students, the more effective the N-SEM is for their creativity.



**Figure 3.** Interaction effect of self-competence and non-synergistic extrinsic motivation on creativity.

Note. Conditional regressions of creativity on self-competence were conducted when non-synergistic extrinsic motivation was high ( $M + 1$  SD) and low ( $M - 1$  SD). Endpoints of the lines represented the scores of creativities when self-competence was low or high.



**Figure 4.** Interaction effect of self-liking and non-synergistic extrinsic motivation on creativity.

Note. Conditional regressions of creativity on self-liking were conducted when non-synergistic extrinsic motivation was high ( $M + 1$  SD) and low ( $M - 1$  SD). Endpoints of the lines represented the scores of creativities when self-liking was low or high.

## 4. Discussion

The relationship between self-esteem and creativity has been widely studied, but there are still a lot of debates. This study attempts to add motivation to explain the real relationship between different self-esteem components and creativity. Then the potential mechanism between them will be found, then a better way to promote the creativity of college students will be established.

### 4.1. The Relationship Between Self-Esteem, Motivation and Creativity

There are three relationships between self-esteem and creativity in previous studies (positive, negative and zero), results of this study support the positive effect of self-esteem on creativity, which is consistent with most studies [16, 18, 19, 22, 25]. However, this study does not stop there, and further analyzes the relationship between the two

components of self-esteem and creativity, it is found that both of them are positively affecting creativity. According to the analysis, self-competence of college students is a kind of cognition and confidence to their own abilities, which is similar to self-efficacy, is about their ability to perform certain tasks of personal beliefs. Consequently, the affirmation on their own capabilities makes them more confident in dealing with difficult problems, and be able to motivate more positive thinking, develop their innovation ability. Compared with self-competence, self-liking is the perception of individuals' value and social identity, performing as that students want to be social acceptance, so this kind of students will seek approval from others through solving problems creatively.

The positive effect of internal motivation on creativity is undeniable, but there has always been a lot of disagreement about external motivation. The results of this study show that internal motivation is still a powerful factor affecting creativity, while two types of external motivation are different: SEM positively influences creativity through internal motivation, but there is no significant relationship between N-SEM and creativity. These views coincide with Amabile [43], but Amabile suggested that N-SEM is harmful to creativity. In this study, the N-SEM of college students showed a moderating effect, that is, when their self-esteem is low, it is indeed harmful to creativity; but when their self-esteem is high enough, it is benefit for creativity (table 2, table 3, figure 3, and figure 4). It is thought that N-SEM has certain negative effects on creativity, but the high level of self-esteem can offset some of the effects. Specifically, when students have high self-esteem, they have a dominant position in self-belief and affirmation, at this time they prefer depend on internal motivation to solve problems. Therefore, a certain degree of competitive pressure or reward will lead to and maintain students' better goal orientation [64-65] or reinforce positive behavior (Behaviorist perspective), which can make them more active in their study.

### 4.2. Theoretical and Practical Significance

This study not only reveals the deep relationship between self-esteem, motivation and creativity, but also constructs a dynamic circulatory system of college students' creativity (figure 1). This model well explains the mechanism of self-esteem, motivation and creativity. The high self-esteem of college students can promote creativity and innovation behavior, which can be understood as a certain potential. And students with this potential will produce creative ideas and products to a large extent, that is, creative achievement. This achievement will enable them to realize their own abilities and values, thus showing higher self-competence and self-liking, then the continuous cycle of innovation and creation is realized. And in this cycle, external environment and motivation promote and regulate it unceasingly, make the whole process full of dynamic and energy, thus this dynamic process achieves an ideal state with continuing spiral up and creative. In practice, the system also provides a way to improve the creativity of college students, that is



the students themselves, parents, teachers, and even the entire school, can be trained to improve and stimulate students' internal motivation, excavate students' own ability and value to improve the level of self-esteem, cooperate with the effect of external motivation under the right circumstances and so on.

#### 4.3. Limitations and Prospect

There are still some deficiencies in this study. First of all, the measurements of all variables are self-assessment of students, so it is inevitable that there will be some "Social Desirability", which affects the objectivity of data [66]. Therefore, quantitative indicators can be used in future research, or the Faking Detection Scale can be added to avoid the impact. Secondly, this study defines creativity as a dynamic process, but the article does not discuss the different processes of creativity. It can be further studied to investigate how self-esteem and motivation affect different stages of creativity. Thirdly, the research focuses on the psychological variables of the student group. However, as the integration of the external environment, people's psychological changes are the products of interaction with environment. Therefore, in order to explore influencing factors of creativity, some environmental factors should also be added. Finally, although this article discusses the moderating effect of N-SEM, some specific moderating effects still need to be further studied, such as what extent of competition, and when and how giving rewards are beneficial or detrimental to creativity. Furthermore, in addition to the self-esteem and motivation variables in this study, there are other mediators and moderators that affect the model, and the mechanisms of action between them are still worth exploring.

## 5. Conclusion

1 Self-esteem (self-competence and self-liking) has a significantly positive influence on creativity;

2 IM (internal motivation) and SEM (synergistic external motivation) have significantly positive influences on creativity;

3 IM mediates the relationship between SEM and creativity, IM mediates the relationship between self-competence and creativity;

4 N-SEM (non-synergistic external motivation) moderated the relationship between self-esteem and creativity.

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