

行政院國家科學委員會專題研究計畫 期中進度報告

子計畫三：大學生網路科技創造歷程的自我覺察之研究：對 抗慣性思考及有損創造力的因子(2/3)

計畫類別：整合型計畫

計畫編號：NSC94-2520-S-009-005-

執行期間：94 年 08 月 01 日至 95 年 07 月 31 日

執行單位：國立交通大學教育研究所

計畫主持人：林珊如

報告類型：精簡報告

報告附件：出席國際會議研究心得報告及發表論文

處理方式：本計畫可公開查詢

中 華 民 國 95 年 6 月 15 日

行政院國家科學委員會補助專題研究計畫 ☐ 成果報告
☐ 期中進度報告

大學生網路科技創造歷程的自我覺察之研究：

對抗慣性思考及有損創造力的因子(2/3)

計畫類別：整合型計畫

計畫編號：NSC 94－2520－S－009－005

執行期間：2005 年 8 月 1 日至 2006 年 7 月 31 日

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成果報告類型(依經費核定清單規定繳交)：精簡報告

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中 華 民 國 95 年 6 月 1 日

Does creative self-efficacy act as an immune mechanism protecting creative performance and intrinsic motivation from influences of expected evaluation?

Chien-Yu Lin Sunny Lin

Abstract

This study intends to test if individuals' creative self-efficacy could serve as a moderating mechanism to immunize against the damaging effects of expected evaluation on their creative writing performance. An experiment with 2 (creative self-efficacy: enhanced/impaired) \times 2 (expected evaluation: present/absent) factorial design was held to clarify this effect. The dependent measures were the Flow Scale and creative writing scores obtained by the Consensual Assessment Technique(CAT) proposed by Amabile (1996) to evaluate the creativity of the short story articles.

In order to increase or decrease subjects' creative self-efficacy, two external cues were adapted together. One manipulation was to give successful or failing creation experiences from controlling the task difficulty by setting time limits—the task with longer time was considered as an easier one and that with shorter time as a more difficult one. The other manipulation was to give creativity-related feedbacks: positive/negative. In the first trial, sixty-five subjects were randomly assigned to two settings. The self-efficacy enhancement group was given the treatment of easy task/positive feedback, and the impairment group was given the treatment of difficult task/negative feedback. The results showed the creative self-efficacy of two groups were significantly different after the efficacy treatments. Creative efficacy of the easy task/ positive feedback group didn't show much improvement, while that of the difficult task/negative feedback group significantly declined.

In the second trial, these two groups received the treatment of expected evaluation (present or absent) when doing the similar creative writing task.

The results are as the following.

1. The interaction of creative self-efficacy and expected evaluation on the flow state were statistically significant. The higher creative efficacy groups showed no difference on the Flow Scale whether the expected evaluation was present or not, while in lower creative efficacy groups, the flowing feeling was less strong when the evaluation was present than absent, which supported the experimental hypothesis.

2. The interaction of creative self-efficacy and expected evaluation on three dimensions of the creative writings—novelty, resolution and elaboration, were not significant. However, by comparing the effects of expected evaluation in the two groups of different

creative-efficacy levels separately, expected evaluation displayed significant effects in the lower efficacy group. On the criteria of originality, complexity, liking and style, the lower efficacy group scored less on those criteria when evaluation was present than absent, while the higher creative efficacy group showed no difference with or without evaluation.

Detailed discussions on the nature of creative self-efficacy and its influence within Amabile's componential framework of creativity and motivation are provided with several implications for future study.

Introduction

Almost everyone has experienced anxiety while waiting to be evaluated on required school assignments or company reports. Under such pressure from expected evaluations or judgments, it seems really difficult to remain calm, concentrate on the composing process and to bring out one's most novel and ingenious performance. However, there are some people who cope better than others with expected scrutiny and deliver surprisingly innovative results. Do these people possess a certain psychological immunity? Based on previous research, the author believes that a sense of efficacy is very likely to play a critical role during these people's creative process.

This study aims to examine perceived self-efficacy produced through the creation process and its relevant impact on individuals' creativity on the written works. Tierney and Farmer (2002) termed creative self-efficacy to describe people's belief about their capabilities to produce designated levels of creative performance. According to Bandura (1986), people with a high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters intrinsic interest and deep engrossment in activities; that's when the journey of creation begins. Therefore, this study intends to observe the effects of expected evaluations on creative writing performance and intrinsic motivation in a sample of Taiwan college students, all while the author focuses on observing the role of creative self-efficacy during the process.

Literature review

According to Amabile's model of creativity in the social context (Amabile, 1986), the expectation of evaluation is conceptualized as one of the non-synergistic, extrinsic motivations that convey external control, decreases intrinsic motivation, and therefore leads to the decline of creativity in individuals' output. This hypothesis has been tested by several experimental studies (e.g., Amabile et al., 1990; Shelley, 1995; Hennessey, 1989; Shelley &

Oldham, 1985; Amabile, 1979). The results show that the presence of an expected evaluation has detrimental effects on subjects' intrinsic motivation and their creative performance in comparison with those who didn't expect being evaluated.

Previous research also found that simply being under others' scrutiny, which delivers an implicit message of being evaluated, would deteriorate individuals' intrinsic motivation and creativity. For example, Enzlo and Anderson's (1994) experiment showed that subjects in the surveillance-with-evaluative-intention group revealed significantly lower intrinsic motivation than the surveillance-without-evaluative-intention group and no-surveillance group. In another experiment by Amabile, Goldfarb and Brackfield (1990), the collective creativity scores of a group without an audience were slightly higher than those of the group with an audience. Working under other's surveillance, subjects reported a significantly higher degree of anxiety and pressure.

Following the trend in researching evaluation and performance, some researchers suggested that whether an expected evaluation brings a negative impact or not depends on what kind of feedback is anticipated. Shalley and Perry-Smith (2001) found that subjects expecting to receive unthreatening and constructive evaluations showed stronger intrinsic motivation and appeared more creative in their projects than those with an expectation of receiving threatening and severe judgments. Amabile and Hill's (1994) investigation on motivation factors in the work environment proved that receiving constructive work-focused feedback proved to be a positive extrinsic variable that enhanced an individual's intrinsic motivation and creative performance.

In reality, however, we can rarely predetermine the nature of feedback that will come from our supervisors or judges. In most cases, individuals are usually exposed to the anxiety of waiting for evaluative feedback on the ongoing works. Surrounded by these unavoidable threatening external factors, how can we still generate novel and ingenious performances? In response to this question, the strand of research addressing the resolution to decrease negative extrinsic motivation on creativity is emerging as follows.

Reward is another widely discussed extrinsic motivating factor that has been proven as similarly detrimental on intrinsic motivation and creativity as expected evaluation (e.g., Amabile, 1996; Joussemet & Koestner, 1999). If people aim at gaining rewards rather than enjoying working on the task, then their overemphasis of extrinsic incentives tends to hurt their creative performance (e.g., Amabile, 1996; Joussemet & Koestner, 1999). Nevertheless, psychologists proposed a way to moderate the harmful effects of extrinsic motivation by enhancing a direct defense of intrinsic motivation when people engage in a creative thinking task. Hennessey, Amabile and Martinage (1989) intended to eliminate the threatening effects of expected reward. They hypothesized that if individuals know practical ways to maintain a state of intrinsic motivation, then their creativity is less likely to be affected by the presence of extrinsic motivation (which is, in their study, the expected reward for tasks). They conducted an experiment showing 113 elementary students an instructional video that teaches

audiences how to focus intrinsic interest toward a rewarded school task. The results showed that, although the group who received the intrinsic motivation training displayed higher creativity when expecting rewards, the trained group had the least creative performance when there was no reward. In another replication experiment (Hennessey & Zbikowski, 1993), the training technique showed significant effect. Nevertheless, after three to four weeks the post-tests showed a decline in effectiveness. These findings imply it is difficult to manipulate the intriguing, psychological dynamics of intrinsic and extrinsic motivation into an optimal and lasting balance simply by using purposeful trainings.

Can we derive a more natural and contextualized immunizing mechanism to protect individuals' creative performance? It seems necessary to revert back to the fundamental question: How does extrinsic motivation decrease intrinsic motivation and finally damage the creative function? Deci & Ryan (1985) states that intrinsic motivation is superseded by extrinsic motivation when one perceives constraints to the inner sense of autonomy from socially controlling events. This shift toward outward goals, such as rewards or evaluations, consequently detracts the individuals' attention on the creation process, causing them to withdraw themselves from taking risks and generating unusual ideas (Amabile, 1996). Notably, self-determination theory claims that an individual is able to transform extrinsic goals into intrinsic motivation. The internalization of such is best facilitated under the social context that satisfies the psychological need for autonomy, competence and relatedness (Deci & Ryan, 1985; Deci, Ryan & Williams, 1996). In other words, people actively engage to determine the psychological locus of a behavior's purpose considering the given external condition. If the social setting allows one to possess more freedom, confidence or personal meaning toward the task, then the initial external goal would be re-interpreted as an intrinsic commitment.

At this point, the study establishes the rational of the proposed immunization mechanism from one key factor that activates the internalization process. This key factor is self-awareness of competence, theoretically identified as self-efficacy—a construct that receives considerable empirical support for its positive relationship with academic or work performance in various domains (Bandura, 1997). The current study speculates that if individuals feel more efficacious toward their creativity, or have stronger confidence to produce creative works, then this belief in creativity-related competence might actively regulate the perception of the expected evaluation and help internalize the task as a personal goal to take challenges and reach self-satisfaction.

In 2002, Tierney and Farmer first presented creative self-efficacy as a newly rising construct. So far, the relevant research has positioned itself to explore the conceptual nature of creative self-efficacy, the measurement issue, and its effect to catalyze creative behaviors (e.g., Tierney & Farmer, 2002; Choi, 2004; Huang & Lin, 2005; Lin & Lin, 2005). However, there is a research gap addressing specific reference criteria used by individuals to judge their ability to produce creative products.

Aiming to enhance creative self-efficacy, this study suggests going back to the original theory of self-efficacy. Bandura (1997) categorized the reference information to assess self-efficacy in four dimensions: enactive mastery, vicarious experience, verbal persuasion and physiological arousal. Among these dimensions, enactive mastery built up from personal, successful experiences is the most significant indicator of self-capabilities (Bandura, 1997; Gist & Mitchell, 1992). Moreover, receiving external positive feedback on individuals' abilities has shown to have a strong impact on improving self-efficacy and subsequent performance (Bandura & Cervone, 1986; Bouffard-Bouchard, 1990). Receiving such feedback is also the most salient and efficient external cue that refers directly to self-efficacy among the four dimensions.

Current study

Altogether, this study intends to either enhance or reduce individuals' creative self-efficacy toward an appointed task by providing external reference cues, in order to observe whether enhancing creative efficacy could immunize individuals against the threat from anticipated evaluations. Since there is still no empirical research examining what the specific efficacy references are in terms of creative self-efficacy, the study decided to adopt two external cues together with the consideration to secure the treatment effects. The two external cues used in the current study are *mastery experience in the creative working process* and *creativity-related feedback*. Specifically, the first group of students was provided with satisfying, creative experiences and positive creativity-related feedback in order to increase their level of efficacy. Meanwhile, the comparison group was provided with unsatisfying, creative experiences and negative feedback to decrease their level of efficacy. This manipulation allowed the observation of whether college students' creative self-efficacy could be adjusted as proposed by Bandura (1997) and Tierney and Farmer (2002).

The author aims to observe whether gaining a higher sense of efficacy, as cued in the first group, would relieve the negative impacts of expected evaluation; and also whether they demonstrate higher creative performance than those whose self-efficacy has been impaired. The hypothesis is tested by a 2 (creative self-efficacy enhancement/ creative self-efficacy impairment) \times 2 (evaluation expectation/ non evaluation expectation) factorial design.

Method

Subjects

The experiment included sixty-five graduate and undergraduate students enrolled in a fall 2003 educational psychology class at a research university in North Taiwan. Among these participants, 27 were male and 38 were female. Their average age was 23.8 years.

Procedure

Trial 1. In the first experimental trial, all subjects randomly entered two experimental

settings to receive creative self-efficacy enhancement or impairment treatments. In the enhancement setting, 33 subjects were assigned to complete a creative written task: writing a short story entitled “hope” during a 20-minute block. They were told to write in whatever form they liked and that the purpose of this writing exercise was to examine the relationship between the writing activity and individuals’ moods. A preliminary study (Lin and Lin, 2004) had already proven that the topic “hope” was easy and fun to write about, and that the time limit was sufficient enough to finish. Therefore, this writing exercise was more likely a satisfying creative experience. After completing the writing activity, all subjects received an evaluation note on their previous homework assignments from their class teacher. These notes all were marked with an “A” rating and read, “Your project is highly creative and attractive, full of novel ideas and interesting opinions.” In the impairment setting, 32 subjects were assigned to complete the same creative writing task with identical instructions with the exception of a pressing, 5-minute time limit. This time limit had been found in the preliminary study to be inadequate for this task, and therefore perceived as a less satisfying, or even a failing, creative experience. After the writing activity, they received evaluation notes marked with a “C” rating that read, “A dull and mediocre project without originality and creativity in comparison with other works.”

Trial 2. After a 10-minute break, all subjects returned to the previous setting for the next trial. Subjects in each setting were randomly assigned to either an expected-evaluation condition or a non-evaluation condition. They were all asked to complete a similar writing task using the topic “The Earth through a Mars inhabitant’s eyes.” This topic had been judged to be both challenging and interesting in the preliminary study. All subjects were given sufficient time, 30 minutes, to finish. Evaluation expectation was introduced by notifying the subjects, “Several expert professors and writers will rate your writing thoroughly according to a set of professional criteria. We will then compare your writing with other articles we have collected in order to understand the quality of your writing. Also, we might use your work as a modeling sample in other relevant studies.” In the non-evaluation condition, no specific statement was mentioned to the subjects.

At the end of the second trial, the experimenter revealed the true intention of this study to all of the subjects and clarified that the enhancement and impairment treatments were designed for experimental purposes and not representative of their actual writing quality.

Measures

Creative self-efficacy. The Students’ Creative Self-efficacy Questionnaire (Huang & Lin, 2005) was distributed before and after Trial 1. This scale, with 11 items, measures personal assessment in individuals’ capabilities to generate a creative output, and falls into three dimensions: efficacy of creative production (e.g., “I believe I can make a unique product.”); efficacy of creative thinking (e.g., “I believe I can generate many different ideas to finish this product.”); and efficacy of recovery from negative feedback (e.g., “I think I will insist in my

initial idea even if my product is severely criticized.”).

Creativity. Creativity, as a dependant variable, was defined as the products of a written creative task. In this study, we used the frequently adopted task of story writing as a means to measure individuals’ creative performance (Amabile, Goldfarb & Brackfield, 1990). After coming to a consensual agreement of creativity, expert judges judged the creativity of the subjects’ written stories following Amabile’s Consensual Assessment Technique (1996). One elementary school writing teacher and two secondary school Chinese language teachers were invited to rate the written products generated in Trial 2. They rated each product using 10 criteria categorized into three dimensions: creativity(originality of idea, novelty of word choice, complexity of idea, liking), technological goodness(appropriateness, clarity, organization) and style(content consistency with theme, elaboration, sophistication of verbal expression).

Intrinsic motivation. Hennessey & Zbikowski (1993) noted that intrinsic motivation on an experimental setting would be better measured as a “state” of the specific condition instead of a stable “trait”. This study, therefore, decided to measure individuals’ flow state—an optimal experience when one engages in an activity with total involvement, concentration and enjoyment (Csikszentmihalyi, 1975, 1990)—as the indicator of an intrinsic motivational state. Following the definition of flow, the study developed a Flow Scale of 16 items with four dimensions: task challenge (e.g., “This task is very challenging.”); involvement (e.g., “I fully concentrated on my work.”); time distortion (e.g., “I felt time had passed so fast when I finished the work.”); and positive mood (e.g., “I felt satisfied when I finished the work.”). The Flow Scale was distributed after Trial 2.

Results

Creative self-efficacy treatment effects

The pair-t analyses on the pretest and posttest scores of the Creative Self-efficacy Questionnaire (CSQ) were conducted to examine the creative self-efficacy treatment effects for the two groups. In the enhancement group, there was no significant effect, while in the impairment group, the posttest score significantly declined after the treatment ($t = 3.12$, $p < .01$, Cohen’s $d = .4$, $d = \text{small}$). The researchers continued to compare the variations by each dimension of the CSQ before and after the treatment. In the enhancement group, there were no significant differences in the three dimensions. In the impairment group, the scores in the efficacy of creative production ($t = 3.40$, $p < .01$, Cohen’s $d = .4$, $d = \text{small}$) and efficacy of creative thinking ($t = 3.99$, $p < .001$, Cohen’s $d = .7$, $d = \text{medium}$) were significantly lower after the treatments. This result was reasonably acceptable, because the impairment treatments: receiving negative feedback on individuals’ products and experiencing failing creative experiences, were external cues directly referring to ones’ creative performances. The dimensions of creative product efficacy and creative thinking efficacy were more relevant

with ones' creative performances, which consequently explained why the treatments brought significant effects only on these two efficacy levels, but not on the efficacy in recovery from negative feedbacks. ((Besides, comparing the effects of enhancement and impairment treatments, it is found that ones' creative self-efficacy seemed easier to be damaged from negative social cues, while difficult to be enhanced even provided with positive efficacy reference information.)

The independent t-tests to compare the post CSQ scores of the two groups revealed a significant difference on the dimension of creative production efficacy, $t = 2.64$, $p < .01$, Cohen's $d = .7$, $d = \text{medium}$. The efficacy level in generating creative products was lower in the impairment group ($M = 3.05$) than in the enhancement group ($M = 3.45$).

Table 1. Means and standard deviations of creative self-efficacy experimental cells

	CSQ	TOTAL	CSQ subtest : efficacy of creative production		CSQ subtest : efficacy of creative thinking		CSQ subtest : efficacy of recovery from negative feedback	
	pretest	posttest	pretest	posttest	pretest	posttest	pretest	posttest
Enhancement	3.33	3.31	3.41	3.45	3.43	3.30	3.14	3.17
Group (n=33)	.37	.58	.64	.65	.44	.62	.48	.54
Impairment	3.37	3.17	3.29	3.05	3.63	3.17	3.29	3.23
group (n=32)	.44	.50	.58	.59	.57	.69	.48	.64

Intrinsic motivation

The 2×2 (enhanced creative self-efficacy VS impaired creative self-efficacy \times expected evaluation VS no evaluation) ANCOVA with the subjects' pretest scores on Flow Scale as the covariate was performed on the post scores on the Flow Scale. The result revealed a significant interaction effect, $F(3, 64) = 4.06$, $p < .05$, but no main effects was found from each variable. By planned comparison of the simple main effects, the expected evaluation showed a marginally significant effect for the efficacy impairment groups, $F(1, 31) = 4.00$, $P = .053$, where the subjects with expected evaluation scored significantly lower than those without evaluation ($M = 3.32, 3.73$ respectively, Cohen's $d = .7$, $d = \text{medium}$). On the contrast, for the enhancement groups, there was no difference between the flow scores of those with or without evaluation expectation. From Figure 1, it appeared that the task involvement and enjoyment of the subjects with higher level of creative self-efficacy were less likely to be affected by the expected evaluation than those with lower creative self-efficacy.

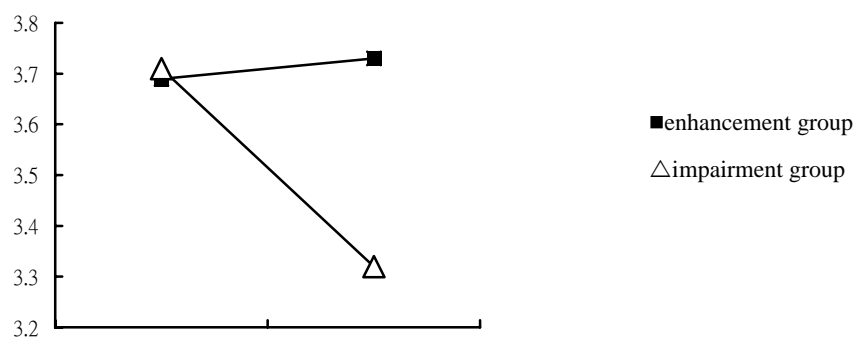


Table 2. Means and standard deviations for the Flow Scale for the four experimental cells

Flow	Creative efficacy enhancement		Creative efficacy impairment		Creative efficacy total		Creative performance The interrator-reliability of the
evaluation	3.71	(.67)	3.32	(.64)	3.61	(.64)	
	n=16		n=17				
no-evaluation	3.69	(.63)	3.73	(.51)	3.62	(.57)	
	n=17		n=15				
total	3.68	(.64)	3.65	(.57)			

creative writing ratings was not as satisfactory as previous researches (eg., Amabile, 1996): Kandall's $W = .54$ ($\chi^2 = 104.08$, $p < .001$) for the creativity ratings, Kandall's $W = .40$ ($\chi^2 = 76.28$, n.s.) for the technological goodness ratings, Kandall's $W = .57$ ($\chi^2 = 108.41$, $p < .001$) for the style ratings. Due to the median degree of interrator-reliability, the researchers decided not to combine each criteria rating into a total score.

The 2×2 (enhanced creative self-efficacy VS impaired creative self-efficacy \times expected evaluation VS no evaluation) ANCOVAs were conducted on the ten criteria ratings with the subjects' prior scores of a similar writing task as the covariate. There were no significant interaction effects between the two variables, so we only reported the main effects. The expected evaluation brought significant effects on the liking rating, $F(1,32) = 6.77$, $p < .05$, and the sophistication rating, $F(1,32) = 4.15$, $p < .05$. The subjects in the evaluation setting scored lower on the criteria of liking ($M = 6.19$; 6.61 , Cohen's $d = .5$, $d = \text{medium}$) and sophistication ($M = 6.80$; 6.02 , Cohen's $d = 1.1$, $d = \text{large}$) than those in the no-evaluation setting. The creative self-efficacy yielded a significant effect on the elaboration rating, $F(1,32) = 4.16$, $p < .05$. The higher creative efficacy group with generated more elaborated writings than the lower efficacy group ($M = 6.54$; 6.14 , Cohen's $d = .5$, $d = \text{medium}$). Noticeably, the experimental effects only appeared on the creativity-related criteria but not on the criteria regarding the technological skills.

According to the above findings, the experimental effects failed to offer powerful evidences to support the research hypotheses. However, when comparing the effects of expected evaluation on the creativity-related ratings separately in the two groups with different efficacy levels, we observed interesting results.

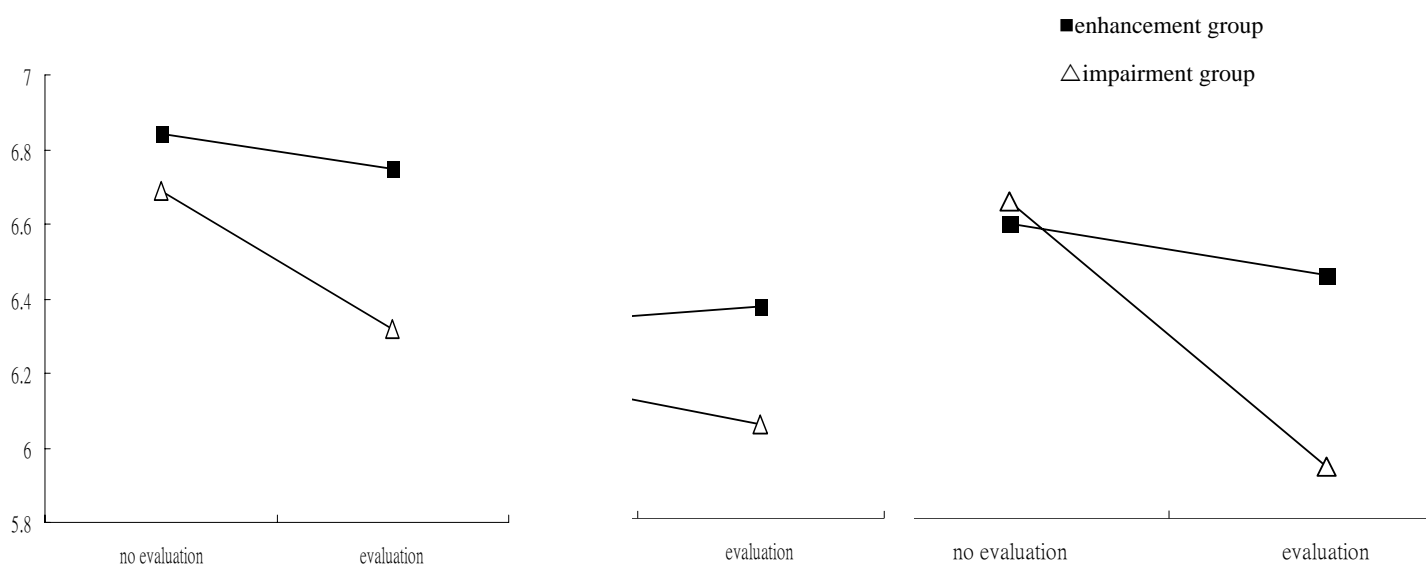
In the impaired creative self-efficacy group, the one-way MACOVAs performed on the four creativity-related scales revealed a significant effect of expected evaluation, Wilk's Λ

=.56, Pillais Trace=.44, $F=5.10$, $p<.01$. From the following one-way ANCOVAs, it is found that expected evaluations had significant effects on the criteria of originality of idea, $F(1, 31)= 5.93$, $p<.05$, complexity of idea, $F(1, 31)= 8.14$, $p<.01$, and liking, $F(1, 31) = 10.65$, $p<.01$. Those under evaluation expectation scored significantly lower on these criteria than those without evaluation (Table 3). On the contrast, for the group whose creative self-efficacy had been enhanced, expected evaluation yielded no significant effect on these creativity ratings, Wilk's $\Lambda = .99$, Pillais Trace=.01, $p>.05$, n.s.

Table 3. means and standard deviations on the creativity-related ratings in the four experimental conditions

creativity criteria	originality of idea		novelty of word choice		complexity of idea		liking		The effects of the expected evaluation in the two
<u>enhanced creative efficacy</u>									
no evaluation	6.84	.89	6.53	1.10	6.32	.91	6.59	.59	
evaluation	6.75	1.09	6.60	1.08	6.37	.88	6.45	.63	
<u>impaired creative efficacy</u>									
no evaluation	6.69	1.05	6.61	.84	6.18	.91	6.65	.84	
evaluation	6.32	1.18	6.35	1.05	6.05	1.14	5.94	1.11	

efficacy groups were illustrated in Figure 2. On all of these three creative criteria ratings, a sharper decline in the evaluation condition can be observed in the impairment group, while in the enhancement group, there wasn't much variation between the evaluation condition and no-evaluation condition. This tendency was similar to the interaction effects of expected evaluation and creative self-efficacy on the subjects' intrinsic motivation (Figure 1).



Instead of treating creative self-efficacy as a variable of trait, the present study attempted

to observe the variation of the state of individuals' creative self-efficacy by giving external cues— feedback(positive or negative) and creative experiences(successful or failing) in an experimental setting. It is found that the individuals' efficacy in creative production of the two groups appeared significantly different after the experimental treatments. On closer examination, the individuals reported significantly lower creative efficacy level in generating creative ideas and performances after receiving negative feedbacks and failing experiences. However, the group with positive feedbacks and more successful creating experiences did not have higher efficacy level. According to these results, several interpretations are considered here regarding the nature of creative self-efficacy.

First, this initial experiment offered an evidence supporting that individuals' creative efficacy could be affected by the environmental information even within as a short period as 30 minutes in the experimental duration. The study surmises that if without sufficient and obvious prior achievements in creativity domain as the evaluative references, individuals' confidence in their creativity, especially in the aspect of creative outcomes, might still have room for variation by the instant external feedbacks. At this point, we suspect that individuals' self-efficacy in the domain of creativity may not be as stable as that in other academic domains, so there is a need to clarify the composite of the stable and tangible part of this construct. In the present study, the answer was limited because the extension effects from the treatment are absent. In the attempt to obtain the general tendency of creative self-efficacy as was measured by Tierney & Farmer (2002), the study suggests that the stability of this construct might be a critical question that needs addressed in the future.

Second, it is surprising to find that the experimental treatments—feedbacks and personal creation experiences, could only damage the participants' creative efficacy level but were unable to enhance it. The creative self-efficacy significantly declined after the impairment treatment, while the efficacy level remained unchanged even when provided with external enhancement. Since these two treatments have been carefully designed to convey effects of similar strength, it appears that individual's assessment toward creativity seems more likely to respond to the threatening and negative external references. Contrastingly, in face with the encouragements and the creativity-related accomplishment, individuals still appear conservative and moderate in their confidence of creativity. Therefore, the study interferes that creative self-efficacy might be more sensitive to the negative external messages, and one can easily lower their confidence under the disapproval circumstances, such as harmful feedbacks or prior unsatisfactory outcomes. As for the enhancement strategies, more research needs to be done to investigate the sufficient quantity and quality of the external references for individuals to feel more certain about their capability in showing novelty.

Besides, the present study confirms that the additive effect of the two efficacy references information, enactive mastery and verbal persuasion (Bandura, 1996), are valid to damage one's creative efficacy. However, which one is stronger to cast the detrimental influence on

the participants' efficacy level in terms of creativity? The separate effects from each reference resource are still unclear. Together with other two reference information: vicarious experiences and physiological arousal, further research on the contributions of each reference to the efficacy level could help map out a more specific and effective route to build one's creative efficacy.

The main purpose of the present study is to examine whether people with higher creative efficacy could relieve themselves from the impact of expected evaluations on their creativity. The hypothesis is supported with respect of the intrinsic motivation. An interaction effect was revealed between the efficacy level (impaired/enhanced) and the expected evaluation (present/absent) on the Flow Scale, especially on the subscales of task challenge and activity involvement. For the lower-efficacy group, those in the evaluation condition reported significant lower flowing state than those in the no-evaluation condition. By contrast, this tendency was not observed in the higher-efficacy group, where no difference appeared between the evaluation and no-evaluation conditions. That is to say, the higher-efficacy group seems to remain indifferent toward the upcoming evaluation and more focused on the activity, while the lower-efficacy group is easily affected by the evaluation message, and their following involvement and enjoyment of the task declined. Though the effect size from evaluation expectation was not as strong as anticipated, this result, in fact, has met our intended goal.

On the dependent variable of our primary interest, creativity, the experiment failed to offer statistically significant evidence to the hypothesis. There were no significant effects from the two experimental variables on the consensually-judged creativity scores or technology scores. Nevertheless, in an effort to examine the impacts of evaluation in the two groups of different creative efficacy, it is found that evaluation expectation did bring damaging power on the scores of creativity-related criteria, such as originality and complexity of the ideas, in the lower-efficacy group. This tendency did not occur in the higher-efficacy group, and was also surprisingly similar with what we have noted on the intrinsic motivation. By these comparisons, the impacts of evaluation were generally more salient in the lower-efficacy group on intrinsic motivation and creativity, whereas the group with higher creative efficacy seems to resist more against the influence of evaluation.

Taken together, the current study try to address the questions posed in the previous research— what effect does creative self efficacy enhancement and impairment have on the impact of expected evaluation on creativity and intrinsic motivation (Hennessey, Amabile and Martinage, 1989)? The study conjectures that the message of the upcoming evaluation might stimulate subjects' to start self- assessment of personal capabilities demanded to fulfill this "severely-examined" task. For the group who received impairment treatment, to decrease their creative self-efficacy might be likely to lower subjects' confidence in their creativity-related skills required to reach the judges' professional standards. This awareness might result in the withdrawal of engagement and lost of the willingness to explore the problem space of the

writing task, and indirectly undermine the creativity of the outcomes.

As for the group who received creative-efficacy enhancement, the present study did not yield potent evidence to confirm the hypotheses. One possible explanation is that actually our enhancement treatment failed to boost the participants' efficacy to a statistically different level. Therefore, the effect of the creative efficacy is probably not strong enough to immunize the participants against the impact of expected evaluation. However, we develop another surmise to interpret the finding - Can creative self-efficacy just serve as so called "hygiene-factor" (Herzberg, 1958), rather than a facilitating (motivational) factor of creativity? That is to say, creative self-efficacy might not be able to help bolster creativity in a direct way as intrinsic motivation does, but only functions in the presence of the extrinsic motivation to protect individuals from the negative impacts.

In addition, the current study also put forward another question: what is the most desirable predication regarding this research trend of introducing an extrinsic intervention to immunize creators' against the external negative impacts? Should we give the highest expectation of creative performance to the group who receives the purposeful treatment in any conditions? Our findings did not totally consist with previous research (Hennessey & Zbikowski, 1993), where an intrinsic motivation training was adopted to immunize children against the negative reward effect on creativity. They found it was those in the training/rewarded condition scored highest on creativity among other groups. In the current study, the subject who received efficacy enhancement treatment just appeared "unaffected" or "neutral" rather than being encouraged to bolster their creativity whether evaluation is present or absent. If "immunize" means "not to be affected or upset by a particular type of behavior or emotion" as defined by Cambridge Dictionary, then perhaps the unaffected state could be considered acceptable to meet our purpose. So far, many inquires has been addressed in the light of the intriguing relationships among creative efficacy, intrinsic motivation, and creativity. The study suggests further replicate experiments can offer more empirical evidences to clarify these essential issues.

The substandard interrater-reliability would be the limitation. The technology-related criteria, such as appropriateness and organization, yielded the lowest reliability, and the creativity-related criteria only reached medium reliability. Although an open-ended topic was predetermined for the subjects to develop their story scenarios, we didn't confine the genre or style. Hence, it was difficult for the raters to make relative judgments on the technology criteria across these articles of various genres. Besides, in the post interviews, we found the raters, most of whom are school teachers, tended to follow personal implicit definitions of what a Chinese creative writing should be to conduct the assessment, instead of the given criteria. As Runco and Johnson (1993) had noted, teachers' idiosyncratic concepts toward "creativity" are likely to act as unconscious standards with which to evaluate students' creative performances. It should be cautious that judges' implicit subjectivity of creativity

would probably interfere with the consistency in using the consensual assessment technique to measure creativity.

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