Predicting cognitive creativity based on adolescents' emotional creativity

Seyed Abolghasem Seyedan*

Instructor of Psychology, Mazandaran University and Torbat Heydariyeh

sa.seyedan@yahoo.com

Bahareh Golmohammadi

Bachelor of Psychology, Payame Noor University

bgolm4@gmail.com

Abstract

The present study aimed to investigate the predictive level of cognitive creativity based on adolescents' emotional creativity in the population of all first grade high school students in Babolsar in the school year of 2017-2018. The sample was selected by single-stage cluster sampling and then a simple random selection of 60 students. Data were collected through the Abedi Creativity Questionnaire (19840) and the Averill Emotional Creativity Inventory (ECI) 1999. The research method is descriptive-correlational and the used statistical method is multiple linear regression. The general finding showed that emotional creativity is able to predict cognitive creativity (F = 2459 and P <0.000).

Keywords: Cognitive creativity, emotional creativity.

Problem Statement

Developing the power of human thought and thinking is the main axis of the learning process. Creativity is a special kind of problem solving. Problem solving is a more objective activity than creativity. In problem solving, the person is faced with a situation for which he must find a solution. In creativity, the person creates both the situation and the solution (Seif, 2012).

Sensitizing or being aware of issues and gaps in knowledge and its missing factors, putting together existing information, defining problems, identifying missing factors, looking for solutions, hypothesizing and modifying and retesting them, completing them and finally presenting the results are a definition of creativity.

In the learning process, a space must be created so that students have the opportunity to think and the teacher teaches how to think instead of teaching thought. Many educational circles emphasize learning information and content, rather than emphasizing the development of adolescents' intellectual talents. Therefore, lecturing remains a superior method of teaching. This method causes the spread of a passive method in education (Abili, 1995)

In active education, the teacher makes the students thirsty instead of slaking them. He takes the mind out of balance and stillness and contentment so that the person himself can

achieve the principle of balance naturally. What exactly is our ultimate goal in learning? Is learning important or how to learn? Does the content of the learning matter or the method of learning? Are we looking for mind density or mind evolution? Do we deal with the balance of thought or its imbalance? Absent science is the same plan of ambiguous situation, problem-finding, passive-finding, confrontation, imbalance of mind, etc., so that the power of creativity, invention, discovery, investigation and research appear (Karimi, 1994).

In fact, a creative person is one who has a searching and creative mind. Webster (1953) defines creativity with terms such as discovery, invention, and innovation, and defines the word creativity as meaning to create. In Sillamy psychology creativity is defined as the desire and taste to create that is potentially present in all people and at all ages and is directly and closely related to the socio-cultural environment. To achieve this natural tendency to self-actualization some conditions are required. Fear of perversion and conformity to society stifles creativity. Young children who are amazed by things and events and try to discover the novelty of world are particularly creative as long as they are not influenced by conventional education (Kefayat, 1994, 61). Based on the definitions and explanations that have been given about the nature and function of creativity, it is clear that creativity is the result of a kind of innovative and unique thinking of individuals that may also lead to the production of a tangible product. Therefore, it would be appropriate to use the term creative thinking instead of the word creativity.

In general, creative thinking and performance is a new factor towards human ideas and experiences. It is the agent of change and evolution which must necessarily be beneficial to human beings and society, such as new ideas, innovations, inventions and discoveries. The meaning of creativity is the ability or mental or physical power to create or reconstruct reality in a unique way (Duffy, Bernadette, 2001, p. 38). Gestalt psychologist Max Wertheimer first coined the term "creative thinking" and described it as thinking that leads to something really useful (Bruno, 1991, p. 82). Torrance interprets creative thinking as the result of explosions of individuals' inner insights (Torrance, 1979, p. 24). Evertt Shostrom (1967), author of the famous book *The Psychology of Man the manipulator*, considers creative behavior to be a yet domineering behavior and says, "I define creative behavior as a self-building behavior. Self-building behavior is a form of imperious behavior which appears more creatively. We are all domineering, but instead of rejecting our domineering behavior, we should change it and turn it into self-building behavior (Sarmad, 2004, p. 25). Calhoun (1961) considers creativity to be inherently emotional in nature and considers it a process during which the creative person transforms irrational and emotional elements into rational and conscious elements.

To face the multitude of challenges that the future holds in its heart, human society considers education an inevitable asset in the pursuit of ideals such as peace, freedom and social justice. Due to the development of technology and the constant changes that occur, the conditions for change must be created in every society. The basic condition for any change is knowledge and awareness, followed by planning work to achieve the desired goals. The importance and fruitfulness of better teaching and learning methods have always been considered by scientists and

researchers in the educational sciences. Many studies have been done in many countries for forty years on the effectiveness of the teaching methods in all subjects since the beginning of the twentieth century by Moman and Lai and then Clapard, Maria Montessori, John Dewey, Herbert, Thorndike and his colleagues (Afshar 2011 p. 183)

Creativity in the field of emotions began in 1980 by the activity of Averill and defines emotional creativity as the ability to experience and express a combination of emotions in an innovative and effective way (Hashemi, 2009). Emotional creativity includes four criteria that are expressed as follows. 1) Honesty, honest expression of one's experiences and values 2) Innovation, making changes in common emotions or creating new emotional states 3) Effectiveness, coordination of emotions with a position that is ultimately beneficial to the individual or group. 4) preparation, the ability to understand emotion and the desire to recognize it (Averill and Knowles, 1991).

Now we are looking for the answer to the question of whether cognitive creativity can be predicted based on the level of emotional creativity or not?

Research Methodology
The research method is descriptive-correlation.

Society and Statistical Population of Research
The statistical population of the present study included all first grade high school students in Babolsar in the school year of 2017-2018

Statistical Sample and Sampling Method

First, it was selected by single-stage cluster sampling method, then simple random sampling. (Sample size is 60 people.)

Data Collection Tools
Abedi Creativity Questionnaire:
In order to measure creativity in this study, Abedi creativity test was used. This questionnaire consists of 60 three-choice questions. This test was created in 1984 by Jamal Abedi in Tehran based on Torrance's theory and definition of creativity and was performed on a group of 650 third grade middle school students in Tehran. In 1989, Abedi and Schumacher redesigned the test materials in the United States due to lack of access to the original copy. The new version was revised many times and was used for the first time by Abedi, Anil and Spielberger (Daemi, 1997). The reliability of the creativity test was retested for middle school students in four sections of the test as follows. fluidity reliability coefficient of 85%, initiative of 82%, flexibility of 84%, and expansion of 80% of internal consistency estimation using Cronbach's alpha was obtained on 2264 Spanish students (1994) and the internal consistency coefficient for the fluid section %75, the flexibility section was 66%, the initiative section was 6%, and the expansion section was 61% (Abedi, 1993). Test validity: Validity studies have been performed on Abedi creativity test. Validity correlation coefficients between the four scores of the Torrance Creativity Test and the four components of Abedi's creativity range from 15% to 41%. The highest correlation between psycho-verbal scores is in this test. The correlation between the components of Abedi's creativity test and Torrance scores was obtained. These coefficients have been

reported as average and above average (Abedi, 1993).

Averill Emotional Creativity Inventory (ECI)

The Averill Emotional Creativity Inventory was used to measure the emotional creativity variable of the Averill Emotional Creativity Scale (1999). This scale has 30 items and four dimensions (components) including innovation, effectiveness, originality and preparation. Among them, 7 items measure emotional preparation, 14 items innovate, 5 items measure effectiveness and 4 items measure originality. In front of each item is a range from 1 (very low) to 5 (very high). It should be noted that questions 11 and 29 are scored in reverse. Averill (1999) reported the reliability of the total score of emotional creativity using Cronbach's alpha coefficient of 0.91. Averill (1999) used factor analysis and correlation with similar tests to evaluate the validity of the scale, which based on factor

analysis obtained three dimensions instead of four, and the dimensions of effectiveness and originality formed a factor together. The first dimension is innovation, which includes 14 items, and the dimension of originality includes 9 items and preparation includes 7 items. Hashemi (2009) confirmed the three-factor model of this scale on a sample of Iranian students and reported its validity and obtained the reliability coefficient of this scale using Cronbach's alpha coefficient. He calculated the alpha coefficient for the subscales of innovation, originality and preparation to be 0.85, 0.71 and 0.64, respectively.

Results and findings
The Cognitive Creativity Hypothesis is Predictable Based on Emotional Creativity

Table: summary of the model				
Model	R	R Square	Adjusted Value of R	Error
1	.545[a]	.297	.285	17.263

Anova Table						
Model		Total Squares	df	Mean Squares	F	Significance
1	Regression	7316.029	1	7316.029	24.549	.000[b]
	Residuals	17284.954	58	298.016		
	Total	24600.983	59			

To investigate the multiple relationship between these variables, multivariate linear regression method was used by gradation method. In this regression method, the components of emotional creativity as predictor variables and cognitive

creativity as outcome variables were entered into the regression equation. The results of this study are presented in the table. The results of this model showed that emotional creativity predict cognitive creativity with a value of (F = 24.549, P = 0.00>).

Conclusion

Creativity in the field of emotions began in 1980 by Averill and defines emotional creativity as the ability to experience and express a combination of emotions in an innovative and effective way (Hashemi, 2009). Emotional creativity includes four criteria that are expressed as follows. 1) Honesty, honest expression of one's experiences and values 2) Innovation, making changes in common emotions or creating new emotional states 3) Effectiveness, coordination of emotions with a position that is ultimately beneficial to the individual or group. 4) Preparation, the ability to understand emotion and the desire to recognize it (Averill and Knowles, 1991).

Leading researchers at the University of North America Psychometrics Laboratory, including T.J. Thurston et al. G. Miller (1954), in a joint project with the University of Chicago to build a valid Creativity Test (CREE) for General Motors personnel and to identify creative and non-creative people found that creative people do not like regular, systematic work. They are impatient, they suffer from listening to lectures, they are restless and they frankly express their opinions, they are studious but not to solve problems, they have certain artistic inclinations, they do not spend much time outside the house, they are not afraid of problems, they are less worried about the future, they present the best ideas under pressure (Karami, 2006, p. 5). Curious people never get bored. For them, life is an endless research (Robbins, 1991). Creative minorities are positive. They are the ones who keep the spark of hope and optimism in the midst of doubts and despair. The creative minority believes in the progress of culture and gives more impetus to the cycles of history, development and progress of society and humanity (Suri, 1995, P. 238). Creative people are bound to go beyond what others expect of them (Beecher, 1880). From their point of view, time is never limited to achieve a goal (Elliott). These statements are just a part of what experts say about the characteristics of creative people. Some psychologists, such as Taylor and Barron (1963), have tried to characterize creativity with personality traits. They have listed prominent characteristics such as autonomy, relativism, acknowledging the mistakes, desire for complexity and novelty and humor for creators (Kefayat, 1994, pp. 66 and 67). Estiz also considerss mental health, flexibility, preference for complexity, discretionary power and initiative as the characteristics of creators (Seyed Ameri, 2002, p. 100). Creative people usually have different, interesting and sometimes strange personality and behavioral characteristics even since childhood. A review of the status of scientists and artists who have made original and important achievements in their fields shows that personality factors such as independence in judgment, motivation to progress, initiative and tolerance for ambiguities are among the important conditions for achieving creative discoveries (Heligard, 1989, pp. 55 and 56).

Having a sense of humor and joyful behaviors are other general characteristics of creative people. Related tests evaluate sense of humor as the third rank of creative people and the same feature in the ninth rank of the gifted. Creatives create a happy and exciting atmosphere for themselves and others with unusual and funny conclusions from any subject. Humor integrates or synthesizes physiological, psychological, and social processes. Therefore, the ability to create jokes and humor or having the ability of humor is an important feature of creative people. Without humor, life is unbearable for most people. For many people, humor is a way of survival and a healing force ... Many creative problem-solving researchers have noted that the

successful solutions are sparked by humor (Torrance, 1979, p. 241).

Fantasy has also a very positive function in the growth of creativity like sense of humor. Nietzsche believed that the elimination of fantasy is equal to the death of human, or Somerset Maugham emphasized that inspiration is the basis of creative thinking. In fact, what is considered a fantasy today may come true tomorrow.

There are many scholars who are interested in mentioning the personality traits of creative people, including Steiner (1965), Baron (1969) and Barbara Clark (1979). In the mid-1980s, Thomas Beckley and David Boyd, were finally able to identify the following five factors as important and general aspects of the lives of creative people after studying the writings on the "Psychology of Creativity" .

A: Need achievement: Such people are always looking for ambitious goals and success.

B: Self-control: The life and destiny of such people is determined not by chance, but by their own will and control.

A: Tolerance for risk: Risk-taking is relatively a characteristics of creative people.

Findings of our research entitled "Study of the relationship between creativity and emotional sensitivity of male and female students in the first and second grade of high school in Birjand" in 2013 by Ahadi, Mazaheri and Fakhri and the results indicate that more creative people, the more emotional sensitivity. In terms of characteristics, creative girls tend to be imperious and less creative boys tend to be more adventurous. And Bamboti (2008) showed that many students who can adjust the cognitive, motivational and behavioral aspects of their academic performance have been very successful as learners. These findings suggest that self-regulated learning is a predictor of academic performance, and that learners need to learn how to adjust their performance and maintain their goals despite difficult assignments in order to achieve academic success. It also confirms that cognitive creativity changes can be predicted based on the level of emotional creativity of individuals.

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