

# Intelligence current in creative activities<sup>1</sup>

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In this paper, the term 'intelligence current' is further explained and the problems found in relationships between (among) creativity, intelligence, attitude and environmental factors are discussed, according to the systematic model of creativity previously developed by the author. In this model, the performance of an individual's *creativity* is treated as a function of *intelligence current* directed towards a creative activity and the *task* that is evaluated by the individual's surroundings or society in general. The intelligence current is treated as a function of one's *intelligence*, *personality*, and *the social factors* surrounding the individual, as well as the *time* that is spent on the task. The author tries to (1) re-interpret creativity in terms of human intelligence; (2) make a theoretical explanation of the relationship between creativity and intelligence which has long puzzled many researchers; (3) emphasize the subjective efforts of an individual in the performance of creative action; and (4) clarify the mechanism of how one's intelligence is controlled, distributed, and directed (or invested) to engage in creative activities resulting in creative achievements.

Where there is a will, there is a way.

(A Chinese idiom)

Long, long ago, there were two monks: one was rich and the other was poor, living in a tall forest in Sichuan. One day, the poorer said to the richer: 'I plan to visit Southern Sea, what do you think about it?' 'With what support will you go?' the richer replied. 'One bottle and one bowl are enough', the poorer said confidently. 'I tried to buy a boat to go there several years ago, but it did not work out'. The richer continued, 'How could you get there?' Next year when the poorer came back from the Southern Sea and met the richer, the richer was ashamed.

(A fable selected from *The Collection of Bai He Tang (White crane house)*)

## Introduction

In recent decades, statements made on the relationship between creativity and intelligence have been quite controversial. Some scholars have suggested that

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creativity is a vital component of giftedness (Renzulli, 1978; Li, 1984; Yao, 1984; Albert & Runco, 1986, 1989; Feldhusen & Treffinger, 1990) or that creativity is one dimension of intelligence (Treffinger, 1980). Others have concluded that there is little relation between creativity and intelligence because the correlation coefficients of the scores on creativity tests and intelligence tests are low, especially when IQ is 120 or higher (Yamamoto & Chimbis, 1966; Fox, 1981; Tannenbaum, 1983; Eysenck, 1997). Meanwhile, more and more researchers are concluding that creativity is not just one facet of giftedness in children (Runco, 1993; Sternberg & Lubart, 1993; Albert & Runco, 1999). Runco (1987) described the generality of creative performance as a function of the level of intellectual ability. Findings from comparative studies on creative thinking between intellectually gifted and average children (Li, 1984; Yao, 1984; Shi & Xu, 1999a; Qu & Shi, 2003) suggested that intellectually gifted individuals perform much better than intellectually average ones. Findings from cross-cultural studies on technical creativity (Shi & Zha, 1990; Hany & Heller, 1996; Shi, Zha, & Zhou, 1998) indicate that performances on conventional creativity tests by intellectually gifted children are significantly better than those of average children. However, there is still some discord between theoretical exposition and the results of correlational studies. The findings of many correlational studies (Fox, 1981; Tannenbaum, 1983; Yamamoto & Chimbis, 1966; Eysenck, 1997) showed that the correlation between children's creativity and intelligence is unclear. Fox (1981) reviewed 14 studies of relationship between creativity and intelligence and found that there is little relation between creativity and intelligence. Tannenbaum (1983) found, too, a zero to moderate coefficient of correlation between creativity and intelligence. Moreover, most studies on creativity found that when  $IQ \geq 120$ , creativity was weakly correlated with intelligence. For example, Yamamoto and Chimbis (1966) studied the correlation between creativity and intelligence with 5th grade children and found that when  $IQ < 120$ , the coefficient is about .20, but when  $IQ \geq 120$ , the coefficient is nearly zero. In another study with 496 subjects of 3- to 7-year-old preschool children, Fuchs-Beauchamp, Karnes and Johnson (1993) and their colleagues found that when children's  $IQ \geq 120$  (Stanford-Binet's scale), their creative thinking ability (originality, fluency) had a correlation coefficient of .12. Normally, a child will be labeled as gifted when his/her  $IQ \geq 130$  (sometimes  $IQ \geq 120$ ). As a result, researchers may assume that there exists only a low correlation between gifted children's creativity and their intelligence.

However, in a very recently published article, Kuncel, Hezlett and Ones (2004) strongly argued that a general cognitive ability test can predict not only school performance but also job performance, as well as creativity, according to the results of their meta-analysis based on 98 references. On the relations between creativity and intelligence, they analyzed the correlation between the MAT (Miller Analogical Test—a test widely used to evaluate general cognitive ability or general intelligence) and creativity ratings and found that the true score correlation for predicting these ratings was a moderate .36 ( $k = 6$ ,  $N = 1,104$ ,  $SD[\rho] = 0$ ).

Obviously, several questions pertaining to the discrepancy of findings on relationships between creativity and intelligence are still intriguing. Why is there no significant correlation between the creativity and intelligence of gifted children or so-called high IQ children? Some researchers suggest that the creativity of children is very different from intelligence when their  $IQ \geq 120$  (cf Sternberg & Lubart, 1993). For example, Guilford (1967) argued that even though a child's creativity is based on his/her intelligence, the two variables may exist independently when his/her IQ is high enough (for example,  $IQ \geq 120$ ). There are also alternative explanations. The structure and contents of most creativity tests are quite different from that of most intelligence tests. In other words, intelligence tests may emphasize some facets of children's ability or abilities in general while creativity tests may emphasize others or domain-specific and/or content-specific abilities (Runco, 1998). So the correlation coefficient between creativity and intelligence is low.

All these explanations sound reasonable and convincing, but there are still some points which are hard to explain. If we accept the assumption that creativity is different from intelligence, we may be puzzled by other questions. For example, results of studies conducted in China indicated that intellectually gifted children were superior to normal children in creative thinking (Shi & Xu, 1999a; Shi *et al.*, 1998; Zha, 1990). If we try to accept the assumption that the contents of creativity tests are quite different from the contents of intelligence tests, we are confronted with another puzzle. If the low correlation coefficient is caused by the different construction and contents of creativity tests and intelligence tests, the low coefficient ought to appear in all children, not only in those children with  $IQ \geq 120$ .

So, researchers are still faced with puzzles about children's—especially gifted children's—creativity and its relationship to their intelligence. The present paper tries to explore the following questions.

Does a close relationship between creativity and their intelligence exist? If so, what is this relationship? Why should we detect the relationship between creativity and intelligence? What is its implication for education in general and gifted education in particular and for child-rearing practices?

### **Definition of creativity**

Before the correlation between creativity and intelligence is further discussed, we would like to look at what creativity is. Unfortunately, until now, no definition about creativity has surfaced which has been accepted by all researchers in this field, even though creativity is widely studied. For example, Guilford (1967) emphasized creative thinking when he discussed children's creativity. He decomposed creative thinking into several components, such as divergence, originality, fluency, flexibility, elaboration and so forth. In other words, from Guilford's point of view, creative thinking is composed of different thinking variables. Torrance (1988) detected creativity from the perspective of cognition. He described creative thinking as a process of recognizing gaps of missing elements, formulating hypotheses about what

is missing, testing these hypotheses, revising and re-testing the hypotheses and, finally, communicating the results (p. 47). However, Urban (1990) thinks that creativity may neither be described sufficiently under purely cognitive perspectives, nor from the perspectives of personal and/or social psychology.

In Urban's (1990) componential model of creativity, six components are considered. These are: general knowledge and thinking base, specific knowledge base and skills, divergent thinking and doing, motivation, openness and tolerance of ambiguity, and focusing and task commitment.

In Sternberg's three-facet model of creativity (Sternberg, 1988a), there are three basic aspects that interact to generate creative performance: a) cognitive aspect, b) intellectual style and c) personality variables. According to some personality psychologists, 'creativity is not an ability variable, but a personality one' (Eysenck, 1997, p. 115).

Obviously, all the theories or perspectives mentioned above address some very essential aspects of human creativity. Some of them are even comprehensive, but not sufficiently satisfactory. We all know that an individual is also a social individual. Behavior of an individual is influenced by factors from society. In other words, an individual's creative behavior and its product occur in a particular society with a certain cultural background, and will be influenced and, of course, evaluated by that society. So, as researchers working in the field of creativity, we must consider the factors beyond an individual's intelligence, cognition or personality, and beyond the creative processes. We must consider the factors from the surroundings, from the society and culture. As Csikszentmihalyi indicated 'originality, freshness of perceptions, divergent-thinking ability are all well and good in their own right, as desirable personal traits. But without some form of public recognition they do not constitute creativity' (Csikszentmihalyi, 1999, p. 314).

We agree with Csikszentmihalyi's point of view. However, when we consider social or cultural factors in discussing human creativity we have to face several issues, such as; how does an individual's cognition or personality interact, in the processes of creativity, with the factors from social environment? To what extent does one's intelligence impact his/her creative performance? And to what extent does one's personality impact his/her creative performance? Finally, within what mechanisms do factors from micro- and macro-environment impact an individual, and in turn his/her creative behavior?

When both micro- and macro-environments are considered, an individual's creativity is defined as a manifestation of one's intellectual activities which are influenced by the environment and culture in which one grows up (Shi, 1995; Shi & Xu, 1999b, 2004). Creativity that is influenced by one's personality is composed of creative attitude, creative behavior and creative products. The core of creativity is one's creative behavior, including creative thinking, creative habits and creative activity. So mathematically, we can look one's creativity as a function of one's active intelligence, personality, tasks, factors from social environment and the time one is engaged in creative activity (Shi & Xu, 1997). The active intelligence refers to that

part of one's intelligence that is involved in or directed towards creative activities. We would like to refer to this active intelligence as Intelligence Current (IC). Also, IC can be looked upon as a function of one's intelligence level (or intellectual potential), personality, social factors and the time one spends on a specific task. One's creativity is also a function of one's intelligence current and the task on which one is working. So, the functions can be expressed mathematically as  $f(Ic) = f(I, P, S, Tm)$ , and  $f(C) = f(Ic, Ts)$ . Here  $C$  stands for one's creative performance,  $Ic$  for one's intelligence current in a specific creative task,  $P$  for one's personality traits,  $S$  for the factors from the society or environment one lives in,  $Tm$  for the time one is absorbed in a specific creative task,  $I$  for one's actual intelligence level or intellectual potential, and  $Ts$  for the specific creative task. We can assume that there are several (or many) tasks for an individual to work on during his/her life. Let's suppose  $k$  stands for task, and  $n$  stands for number of tasks an individual works on. That is  $k = 1, 2, 3, \dots, n$ . Then we have

$$Ic = \sum_{k=1}^n (Ic_1 + Ic_2 + Ic_3 + \dots + Ic_n)$$

### **Creativity is a system**

In order to clarify that creativity is a system, Shi (1995) constructed a theoretical model called "A System Model of Creativity (SMC)" (see Figure 1). He did not however specifically explain how the model works. In this paper, I try to further develop this model and how it works in accordance with the new understanding of creativity and its relationship to intelligence.

There are nine components involved in the creativity system which are divided into two subsets. One subset is called 'inner world components' and includes natural intelligence level or intellectual potential, knowledge and experience (including general and specific knowledge and practical skills which are mastered in previous experience), non-intellectual personality traits, attitude or tendency to work creatively and creative behavior. The other subset is called 'outer world components' and includes social environment or macro-environment, working environment (including family, economic and physical conditions), education or educational opportunities and the creative product.

The interaction among the components in the inner world subset occurs within one's own skin. All these components or variables could not be directly observed or measured, but they play their own roles in the system of creativity.

### *Intelligence level*

At the individual level, intelligence level or intellectual potential works as an energy source for the individual to consume. The fact that individual differences in intelligence level can be measured represents the differences of different degrees of energy sources. The higher the intelligence level, the more consumable the energy source: the maximum capacity makes the limitation of consumable intelligence potential, at

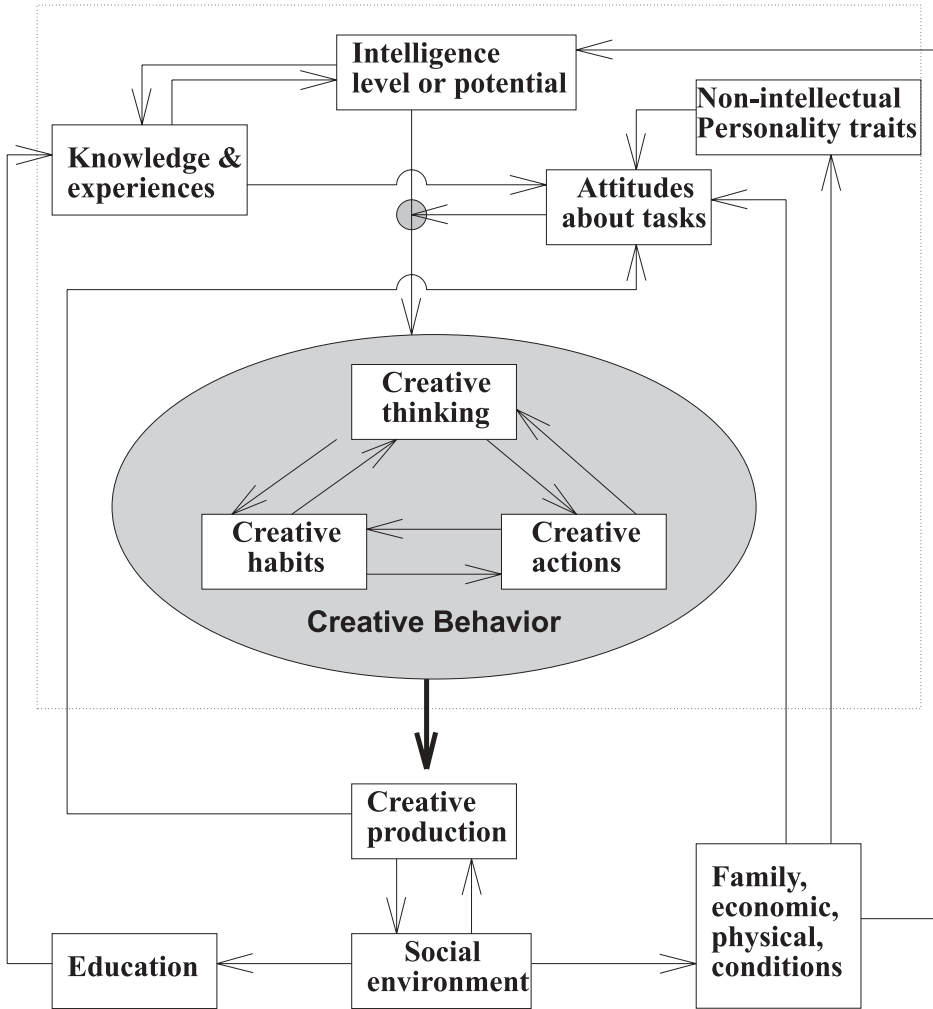


Figure 1. The system of creativity

least at one time. The most important thing one should keep in mind is that the energy source is not a constant. It is malleable or flexible and changes along one's life, although heredity plays a bedrock role in one's intellectual potential.

*Personality*

As the definition of personality is broad enough to cover intelligence, the 'personality' we use here is equated to the term 'non-intellectual personality' excluding one's intelligence. In other words, we think one's intelligence differs from other components of personality or the non-intellectual personality. We assume that intelligence and non-intellectual personality factors play different roles in the system of creativity. The personality referred to here is a narrower personality.

The personality provides a tendency for an individual to do things. An individual with an optimistic personality is expected to do things optimistically even in situations seen as difficult from other persons' points of view. The factor (or the set of factors) of personality plays an important role in the creativity system. Intentionally or unintentionally, consciously or unconsciously, one's personality will influence one's attitude regarding what to do and how to do it.

### *Knowledge and experience*

The acquisition of either general knowledge or specific knowledge is impacted by one's intellectual potential. On the other hand, the knowledge or experience mastered can be useful for the individual in the realization of his or her intellectual potential. In other words, knowledge and experience makes the expression of the individual's intellectual potential more feasible. We all accept that there are some people who have innate music potential. Only when well trained can they express their musical talents or musical potential. Without the benefit of special musical knowledge and the skills learned by playing musical instruments, their musical potential could not be realized. In this case, one can say that knowledge or experience can enhance one's crystallized intelligence (Cattell, 1971; Horn, 1994). Meanwhile, knowledge and experience supply the individual with alternative concepts of himself or herself. As a result, the individual is more likely to take part in activities he/she may otherwise not consider. In this case, we say one's self-confidence can be enhanced through assimilated concrete knowledge and experiences. People may argue that knowledge which is too rich may be harmful to one's creativity because of high levels of critical thinking. This is a separate topic. What we want to consider here is the effect knowledge and experience can have on one's attitude about what to do and how to do it. According to Sternberg and Grigorenko (2002), critical thinking is rather important in one's development of expertise.

### *Attitude*

Attitude here refers to the attitude an individual has concerning the tasks or activities of being creative. One's attitude about being creative can be either intrinsic or extrinsic. These intrinsic and extrinsic attitudes are closely related to intrinsic and extrinsic motivation respectively. The role of one's attitude in the creativity system, specifically in the relationship between intelligence and creative behavior, is very critical and essential. We would like to discuss it in detail later.

### *Creative behavior*

As 'behavior' is too broad to manage in this article, we limit 'creative behavior' here specifically to what happened in the individual directly resulting in the creative product. The creative behavior is composed of three interactive components. They are *creative thinking*, *creative habit*, and *creative action* or *creative operation*. Creative thinking

is thinking creatively, which is widely discussed in a mass of literature. When we say 'creative action' here, we refer to the action or operation that the individual executes when he or she thinks about making the creative product to be actualized. What we strive to emphasize is the 'creative habit'. Habit is an unconscious pattern of behavior that is acquired through frequent repetition or continued practice over a long period of time. Creative habit results from an individual continuously thinking and doing in a creative way to the point that it becomes an automatic way of thinking and doing. No consciousness, no effort and no assignment are required here. Many highly creative people have developed a creative habit. In this manner they continuously keep up their interest, and refuse to give up until the problem is solved or the fact is revealed. People may argue that this is actually persistence or commitment to what a creative individual is doing. It is obvious that persistence and commitment are very important in fulfilling one's achievements, but both of them need to be supported by willingness and effort. They can hardly explain how a creator can have a great idea or come upon the solution to a specific problem while s/he is walking in a garden at ease, or even asleep. There is no willingness, no effort, but an invisible automatic force—habit is just like the inertia. Without a force strong enough to interrupt them they will never stop thinking and doing creatively.

In the subset of out world components or variables, one finds product or production, environment, educational levels or education opportunities, and family conditions (such as social, economical status and physical conditions etc.).

### *Environment*

Many scholars emphasize the importance of environment in the system of creativity (Arieti, 1976; Csikszentmihalyi, 1996). The variable of environment provides a creator with an atmosphere stimulating and encouraging or hindering and even harmful to one's creativity. The role the environment plays in the creativity system will be further discussed later.

### *Education*

In general, education is a specific environmental factor; however it plays a unique role in one's system of creativity. With education here we mean specifically that educational level or educational opportunity for an individual is closely related to his/her knowledge and experience. Generally, we assume that the higher the educational level one obtains the more knowledgeable one is. This assumption does not mean we neglect the fact that to be educated at higher level is not necessary for an individual to be knowledgeable or experienced. Some people may have had numerous educational opportunities and pursued higher levels of education, but are still less knowledgeable or less experienced with respect to creativity. We call these people 'negatively educated' people. However, this is the matter of education itself, and will not be discussed here. (For an in-depth discussion on the relationship between knowledge and creativity, please refer to Weisberg, 1999.)



*Family*

If the environment in general offers a universal atmosphere for an individual, then the family offers a specific surrounding for that person. The family's social status, economic situation, and physical condition are influenced by the general environment. The family variable has a direct impact on an individual's work. It determines how many educational opportunities can be supported, what kind of work conditions he or she may be faced with, and at what level he/she can express himself or herself and so on.

*Creative product*

The product or production is the outcome or the result of an individual's work. It is the key factor in the system of creativity. For the product itself, the distinctive trait or distinctive feature of the product determines whether it is creative or not. Whether or not to place the product in the society, whether the trait or feature of the product is accepted as creative or not is largely determined by the environment, by the people surrounding the product. The relationship between the feature of a product and the acceptance of this product by society is similar to the relationship between 'domain' and 'field' suggested by Csikszentmihalyi (1996). From his point of view, a domain refers to a specific kind of work one does or the specialty one has, and a field refers to a society consisting of many people or specialists related to the domain. An individual works in a specific 'domain' and makes a creative product. But the creative product will not be automatically accepted by people in the field. In other words, a creative product at domain level will not be recognized as a creative product at field level until it is accepted and evaluated by the peers or experts in the field. In order to turn an individual creative product into a societal creative product one needs what Sternberg refers to as 'practical intelligence' (Sternberg, 1985, 1988b). Here we would like to call the creativity at the individual level *self-recognized creativity*, and creativity accepted by the society *society-recognized creativity*. They are similar to Boden's P-creativity and H-creativity (Boden, 1999). The creative product has effects on the environment and sometimes even changes the living standard of the society. Meanwhile, the product is evaluated and selected by the society or its environment and can be recognized and accepted or neglected and rejected by the society. When it is recognized and accepted it becomes society-recognized creativity, and when it is rejected or neglected, it is not thought of as creative by the society, and disappears from the society unless it is re-recognized later. Even a genius product, for example van Gogh's sunflower painting, had to retain the status of self-recognized creativity until it was finally recognized and accepted later. Sometimes this recognition takes many years, and a hundred years or more is not rare in the history of human development.

**Relationship between creativity and intelligence**

In order to explain specifically how the intelligence current works in creative activities, we give special considerations to these four variables: (1) one's intellectual level;

(2) one’s attitude about creative action which is influenced by many factors from the inner and outer worlds of an individual; (3) the task which may be positively evaluated by oneself or society; and (4) the task which may never be positively evaluated by one’s society or oneself (Shi, 1995). One’s intellectual level or intelligence potential serves as a power supplier. The task being positively evaluated by society serves as the target and the task not being evaluated as a non-target. One’s attitude serves as a power switch which connects the intelligence current to what he or she thinks worthwhile or disconnects the intelligence current to what is not worthwhile. In other words, the intelligence current which is directed to a creative activity is controlled by one’s attitude towards the task he/she is dealing with (see Figure 2). There are two forces that may have effects on and change one’s attitude towards a specific task. One force is driven by intra-individual factors, such as one’s interest in a task, curiosity about the task, persistence in conducting the task and motivation to fulfill the task. In many cases, people are not able to fulfill the task not because they are not able to do it, but rather because they are not willing to do it. If a person is not willing to make any effort to fulfill a task, the consequence is, of course, that the task will not be done. Obviously, he/she may not be positively evaluated by society, and not considered to be a creative person. In other words, he/she may not demonstrate to the society that he/she has any creativity even though he/she might have high creative potential.

Another force is driven by inter-individual factors, namely, factors from the outside world of an individual, such as expectations and demands of parents or family, feedback evaluation about one’s creative production from society or from the public, or factors such as economic or physical supports. Let’s consider the example of a very intelligent girl. She spent much time and invested 60 per cent of her intelligence in trying to design a model car creatively. This activity was not however supported by her parents and her teachers. Her work was not evaluated by other people. On the

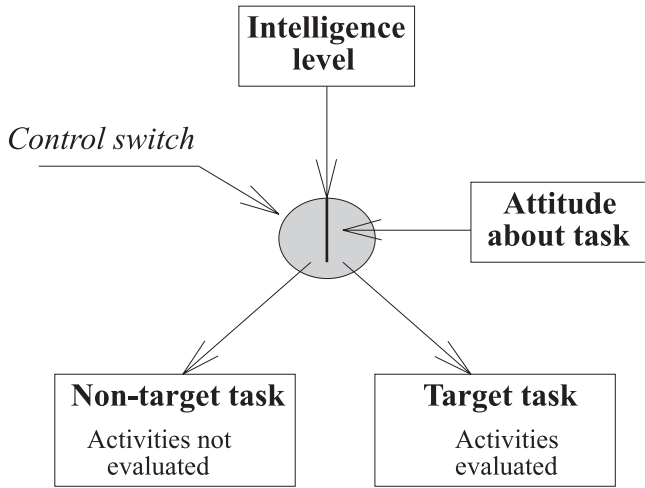


Figure 2. The attitude works as a control switch

contrary, she was expected to maintain good grades in school and earn high scores on school examinations. Her activity of designing the model car was looked upon as nonsense and a waste of time. In other words, the feedback she received from her surroundings was very negative. As a result, she is forced to give up or to invest only about 10 per cent of her intelligence, driven by her own curiosity, into designing new car models. In addition, she may now be looked upon as being less creative. If her production were to be positively evaluated by her parents and teachers and she were to be continuously encouraged by other people, she may become more absorbed by the creative activity. She will be stimulated to invest more of her intelligence current, let's say 80 per cent, in designing new car models. So, she might then be evaluated as being more creative.

The other essential external factor controlling one's intelligence current to creative activities are the conditions under which a person works. Just a few years ago, researchers in China were accused of being less creative or productive. People may think it is because the Chinese cultural principle 'zhong yong zhi dao' (golden mean) makes people less creative. Or some may think it is because there is something wrong with the Chinese educational system which makes people less creative. We cannot deny the role of education or the role of traditional principles, but when you explore the situation faced by researchers in China, you find the real reason in the poor research conditions. Professors' living quarters and office spaces are too restrictive to allow for the proper storage of literature. Libraries do not have enough money to buy international academic periodicals and reference books. Heads of research projects worry about their funding shortages all the time. In order to save their limited research funding, they often have to purchase cheaper research materials. Frequently they need to devote large amounts of time to repairing their research equipment (e.g., computer, projector and so on) themselves. They wind up spending time on everything else but their work. Shortages in funding also means that they have few opportunities to attend international conferences outside their country. A professor in a particularly disadvantaged area would never have the opportunity to go abroad in his/her life. Furthermore, they are not able to inform others about what they have done and what they are doing. Can one say these researchers are just less creative? In this case, creativity may be understood as being condition-specific or situation-specific.

With this sub-model, we can easily explain some common everyday phenomena. For example, some highly intelligent people do not reach as high a level of creative achievement as society expects according to their intellectual level. Other people with so-called average or above average intelligence do reach higher creative achievement than expected by society, but there are hardly any examples of persons with very low intelligence attaining high creative achievement. For some highly intelligent people, if they merely make use of their intelligence to learn more, to gather more information, but do not try to make something new, to produce something new, and/or to create something new, they will not be able to attain high creative achievement. In some cases, people may personally be aware of the fact that they are capable of creating something new and useful for their society, and they may try to realize their

potentials, but the situation they find themselves in cannot efficiently support them, and as a result, these people are not able to express themselves creatively. In fact, originality and value are looked upon as the two most distinctive features of conventional creativity (Sternberg, 1999). Sometimes, people are involved in doing something, but what they are doing is not evaluated or accepted by society or by other people. Consequently, they will not reach a creative level of achievement as high as that expected by their society. For example, Vincent van Gogh's paintings are highly valued by people, by society, by the world now. But what situation did he face when he was working actively? His work was not appreciated by anyone except his brother Theo, and as a result Vincent shot himself under the throws of a deep depression (Hulsker, 1990). Another example is *Soul Mountain* written by Xingjian Gao (Gao, 2000). Because of this novel and other works, Gao won the Nobel Prize for Literature in 2000. His works are extremely valued by Western society but are prohibited in mainland China. The works are the same works, the creator is the same creator, either Van Gogh or Gao. The difference is only the society in which they live, the times they live in. In these cases, we may say creativity is society-specific. Different cultures will give different values to the same product (for a discussion of culture and creativity, please refer to Niu & Sternberg, 2002).

In contrast, some people with average or slightly above-average intelligence can attain remarkable creative achievement if their intelligence was/is entirely invested in what they are willing to do and what they are doing is highly evaluated by their society, by other people. For example, in Reis's investigation (Reis, 1987), it was found that many highly intelligent women did not attain creative achievement to the same degree as their male counterparts. Can we attribute this to gender difference? The answer is 'no'. Women fail to achieve as highly as men because women from most cultural backgrounds do not have the same opportunities as men to invest their intelligence in those activities which are valued by society. The fact is that most women have to spend much time taking care of their family, their husband and their children. So, the low achievement rates of women may not indicate gender differences or the low creativity of women, but rather the public values of society or the effect of cultural background.

## Conclusions

We cannot detect the real relationship between gifted children's creativity and their intelligence without considering intra-individual factors and inter-individual factors.

The low correlation coefficient between creativity and intelligence conceals the real relationship between creativity and intelligence. We cannot say there is no relation or a low relation between intelligence and creativity solely because the correlation coefficient between the scores of the two tests is not high enough.

When both intra- and inter-individual factors are considered, the performance of one's creativity should be explained as the function of intelligence current and the task while the intelligence current is a function of intellectual potential, one's personality traits, social factors and the time invested in creative activities.

Hence, we can expect that the higher the intelligence level one has (especially the more the intelligence current one can invest into valued creative activities), the greater the creative performance one can achieve, if the social supports are positive, the personality traits are good for creative activities and time is fully invested in creative activities.

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