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Creativity, efficacy and their organizational,
cultural influences

Dissertation
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Contents

A) Regarding the experiment of artistic creativity (two versions of Experimental

   materials, experimental file sheets, and judging scale)

B) Regarding the general creativity (Creative Organizational Climate Inventory,

   Beijing Test of Creative Thinking and its Manual)

C) Regarding the efficacy (two versions of the scales of General, Creativity Self-

   Efficacy and Cultural Efficacy)

Acknowledgements

Abstract

Enhancing creativity is important not only for individual but for the whole society. The condition to enhance creativity is to make it clear how about the process of creativity development or expression and the mechanism of individual or environmental, cultural influences, which is a somewhat new, meaningful and challenging topic for psychologists. A high level self-efficacy is thought to be related to better mental, physical health and easier social adaption (Schwarzer, 1992; Bandura, 1997). To examine the cultural and environmental impact on self-efficacy is also necessary for the development of proper intervention.

This doctoral thesis addressed Cultural Pyramid Model of Creativity (CPMC). To examine the relations between culture or climate and self-efficacy, artistic or general creativity expression, different research approaches, such as cross-cultural experiment designs of artistic creativity, cross-sectional designs of the creative organizational climate and creativity development, were carried out in four empirical studies. Investigations were done in creativity, self and collective - efficacy, and creative organizational climate. Participants were Chinese students and teachers from elementary, secondary schools and college students from German and Chinese universities.

The new model of creativity-Cultural Pyramid Model of Creativity (CPMC) (Chapter 1) was developed and got partly confirmed by the four studies. Firstly, the meaningful cultural difference between Germans and Chinese was found. The difference demonstrated that the artistic creativity of German students is significant higher than that of Chinese students. The findings showed that culture can directly influence people's artistic creativity. There is a strong tendency for people in different cultures to express their artistic creativity in different ways. The results of Chapter 4 showed that it is significant the impacting effect of creative organizational climate of school on creativity development of students. Moreover, the study

indicated that there were no significant differences in artistic creativity performance not only between Asian-Germans and Caucasian-Germans, but also between Chinese studying abroad and domestic Chinese. The results demonstrated that multicultural experience can not automatically enhance artistic creativity, and it may depend on the extent of the individual's immersing themselves in foreign cultures (Chapter 2, Chapter 4).

The results of Chapter 3 showed that there were significant differences on cultural efficacy among Caucasian-Germans, Asian-Germans, Chinese studying abroad and domestic Chinese. However, there were no cultural, bicultural, and bilingual differences in general self-efficacy and creativity self-efficacy between German and Chinese participants. The results of Chapter 5 demonstrated that there were significant teaching duration, age differences and significant two-way school × teaching subject interaction in creative organizational climate and significant gender difference in general self-efficacy. Path analysis indicated that the significant path coefficients were from creativity organizational climate to cultural efficacy of own culture, general self-efficacy, from general self-efficacy to cultural efficacy of own culture and creativity self-efficacy, and from cultural efficacy of own culture to creativity self-efficacy. There was only indirect pathway from creative organizational climate to creativity self-efficacy (Chapter 3, Chapter 5)

Additionally, the methodological implications for the future research and the practical implications for Educational Practice, Creativity and Efficacy Promotion were discussed.

Die Kreativität, die Wirksamkeit und der organisatorische, kulturelle Einfluss

Zusammenfassung

Die Förderung der Kreativität ist wichtig nicht nur für das Individuum sondern auch für die ganze Gesellschaft. Die Voraussetzung der Förderung der Kreativität ist um der Prozess der Kreativitätsentwicklung/Kreativitätsäußerung und die Mechanik der organisatorischen/kulturellen Einfluss besser zu verstehen. Das ist eine ziemlich neue, sinnvolle und anspruchsvolle Aufgabenstellung in der Psychologie. Ein hohes Niveau der Selbstwirksamkeit sei verwandt mit besserer körperlicher Gesundheit und einfacherer sozialer Gewöhnung (Schwarzer, 1992; Bandura, 1997). Die Untersuchung des Einflusses der Umgebung und der Kultur auf die Selbstwirksamkeit ist auch nötig für die Entwicklung der passenden Intervention.

Ziel dieser Dissertation war es, den Model der Kulturellen Pyramide der Kreativität (MKPK) zu überprüfen. Die Beziehungen zwischen die Kultur/die Umgebung und die Selbstwirksamkeit/die künstliche oder generelle Kreativität werden mit unterschiedlichen Methoden, wie zum Beispiel das Experiment der künstlichen Kreativität, die Fragebogen des Organisationsklimas oder der generellen Kreativität untersucht. Die Dissertation umfasst vier empirischen Forschungen, die über die Kreativität, die Selbst (Kollekte-)wirksamkeit, und das kreative Organisationsklima sind. Die Teilnahme sind die chinesische Schülern/innen und ihre Lehrer/innen von den chinesischen Grundschulen und Mittelschulen und auch die Studenten von den deutschen und chinesischen Universitäten.

Der neue Model - das Model der Kulturellen Pyramide der Kreativität (MKPK) – wird entwickelt und der wird auch teilweise von vier Forschungen bestätigt. Erstens wird der bedeutende kulturelle Unterschied zwischen Deutschen und Chinesen gefunden. Die künstliche Kreativität der deutschen Studenten ist signifikant höher als die der chinesischen

Studenten. Das lässt sich der direkte Einfluss der Kultur auf die künstliche Kreativität beweisen. Es lässt sich eine starke Tendenz, dass für die Leute von den unterschiedlichen Kulturen andersartig ihre künstliche Kreativität zu äußern. Die Ergebnisse des Kapitels 4 lässt sich folgendermaßen darlegen: dass der Einfluss des Organisationsklimas auf die Kreativitätsentwicklung der Schülern/innen signifikant ist und in dem Kapitel 2 gibt es bei der künstlichen Kreativität kein signifikanter Unterschied zwischen Asiatisch-Deutschen und Kaukasisch-Deutschen, zwischen die Chinesen, die auch in Deutschland studieren, und die Chinesen, die nur in China studieren. Die Ergebnisse lässt sich auch ausdrücken, dass die multikulturelle Erfahrung kann nicht automatisch die künstliche Kreativität fördern. Diese Förderung der multikulturellen Erfahrung ist vielleicht abhängig davon, dass wie Weite das Individuum in den ausländischen Kulturen eintaucht (Chapter 2, Chapter 4).

Die Ergebnisse des Kapitels 3 lassen sich bestätigen, dass es der signifikante Unterschied bei der kulturellen Wirksamkeit zwischen Kaukasisch-Deutschen, Asiatisch-Deutschen, ausländische studierende Chinesen, und inländische studierende Chinesen gibt. Aber der signifikante Unterschied, der bei der generellen Selbstwirksamkeit und bei der Selbstwirksamkeit der Kreativität zwischen die vier Gruppen ist, ist nicht gefunden. Das Kapitel 5 demonstriert das, dass die Unterschiede der Dauer der Lehren, des Alters, und der Zweiwege-Interaktion Schule × lehrendes Fach bei dem kreativen Organisationsklima signifikant sind. Bei der generellen Selbstwirksamkeit ist der Unterschied des Alters auch signifikant. Aus der Pfadanalyse folgt, dass die signifikante Koeffizienten von dem kreativen Organisationsklima zu der kulturellen Wirksamkeit eigener Kultur und der generellen Selbstwirksamkeit, von der generellen Selbstwirksamkeit zu der kulturellen Wirksamkeit und der Selbstwirksamkeit der Kreativität, und von der kulturellen Wirksamkeit eigener Kultur zu der Selbstwirksamkeit der Kreativität sind.

Zusätzlich werden die methodologische Auswirkung für die zukünftige Forschung und die Implikation für die pädagogische Anwendung und die Förderung der Kreativität/der Wirksamkeit diskutiert.

General introduction

This doctoral thesis addresses Cultural Pyramid Model of Creativity (CPMC). Four empirical studies were conducted to examine the relations between culture/climate and self-efficacy, artistic or general creativity expression, using different research approaches, such as cross-cultural experiment designs of artistic creativity, cross-sectional designs of the creative organizational climate and creativity development. Participants were Chinese students and teachers from elementary, secondary schools in China and college students from German and Chinese universities. Implications for further research and meaningful interventions or educational reforms were discussed.

In the following introduction, we give an introduction to the system theories of creativity and to the Cultural Pyramid Model of Creativity. We describe why artistic, general creativity, self and collective-efficacy, and creative organizational climate were investigated, why the students and teacher participants were recruited, concluding with a summary of the subsequent four chapters.

System theory of creativity

Plato and Aristotle described the process of creativity in different ways. Plato emphasized the mystery of the inspiration and the exterior headspring. On the contrary, Aristotle thought that the process of creativity must be based on some natural laws which can be understood. He did not think that creative production comes from some power of mystery or unique, single creative process. He thought that the arts, ideas, and other productions of human beings stand by the logistic steps of natural laws (Rothenberg & Hausman, 1976, p. 58). The controversy of Plato and Aristotle still continues in scientific psychology. Some psychologists emphasize the inspiration and insight or some other unique psychological process beyond consciousness (e.g. Gardner, 1993); some others, just like Aristotle, think that

creative process can be described in terms like special cognitive process and is not so hard to understand (e.g. Ambile, 1996).

More basically, Kurt Lewin (1951, pp. 239-240) thought that behavior and development depend upon the state of the person and his environment, $B = F(P, E)$. He claimed that the person (P) and his environment (E) have to be viewed as variables which are mutually dependent upon each other, in other words, they are one constellation of interdependent factors. The totality of these factors is called the life space (LSp) of an individual. The model is constructed as $B = F(P, E) = F(LSp)$. Life space consists of the interaction of individual and his psychological environment. Lewin thought that the task of psychologists is identical with exploring a scientific representation of the life space (LSp) and determining the function (F) which links the behavior to the life space. He concluded that the function (F) is a *law*. The main system theories of creativity give insights in the *law* in the behavior of creativity.

Componential Model of Creativity

Amabile (1982ab, 1988) has developed the Componential Model of Creativity, which is based on the perspective of social psychology of creativity. Three necessary components are included in the model, domain-relevant skills, creativity relevant skills and task of motivation. In a revision of the model Amabile (1996, 2003, 2004) added the component of social environment. Amabile and her colleagues (Amabile, 1996; Amabile et al., 1996) found in their laboratory a positive relationship between a person's intrinsic motivation and their creativity. The results demonstrate that when one is motivated by one's own purpose (intrinsic motivation), rather than by outside forces such as the receipt of a prize, or being subject to surveillance, expected evaluation, restricted choice, or other social constraints (extrinsic motivation), one can have more internal interest, and one's work will show more likely to be higher in creative quality. In other words, one's creativity can be undermined when one's

intrinsic motivation is low.

To apply the theory and findings to the real world, Amabile (1996) suggested that most kinds of systems, such as educational system, overall classroom climate, college and work environment, and family environment could be meaningful resources to facilitate or inhibit one's creativity. Her idea is that all of these environmental components have a cumulative and interactive effect, which eventually decide one's motivational orientation (either intrinsic or extrinsic), and subsequently partially decide one's creativity.

The Evolving Systems Approach (ESA)

The Evolving Systems Approach addresses the need for direct study of the creative process in recognized creators at work, in contrast to indirect methods, such as those used in psychometric studies. Whereas Amabile and her colleagues studied environmental effects on the creativity mainly of normal people, Gruber and Simonton (1988, 2000) have used case or biological studies and historiometric methods to study the creativity of eminent people such as Darwin. Gruber and his colleagues (Gruber & Davis, 1988; Gruber & Wallace, 1999; Gruber & Wallace, 2001) developed the ESA to define the developing work in terms of interacting, related elements. In a broader sense, it is systemic because the system of the individual interacts with other private and public systems, such as the person's family, relevant professional milieus, and existing sociocultural-political systems.

Simonton has analyzed many geniuses in history across areas, time periods, and cultures, and has also concluded that the social environment can have nurturing (or inhibitory) effects on the creativity development. Simonton (2003ab, 2004) thought that creativity can not be well understood, if the social environment is not concerned, because creativity is a special style of interpersonal interaction. Unlike Amabile, Simonton has focused on broader environmental contents, such as those created by economic, political, social, and cultural conditions. Also unlike Amabile, Simonton has proposed that the effects of environment on

the creativity of eminent people could vary across different social situations. In other words, different environments can shape eminent people's creativity in different ways. Simonton thought that eminent people are closely integrated into a larger social world, stimulate each other, and become the bases for the Zeitgeists of that society.

Three-pronged systems model

Environment may impact not only the expression of creativity but also the judgment of creative production. Rather than looking at how the environment influences an individual's creativity, Csikszentmihalyi and his colleague (1990, 1996; Csikszentmihalyi and Wolfe, 2000) pay more attention to the importance of the dual functions of environment as both a judging and a nurturing resource. He proposed a dynamic model of the creative process, a three-pronged systems model. In his model, Csikszentmihalyi (1996) presented three main shaping factors underlying creative production: (1) the domain, which contains the symbol system of a culture, such as the domain of art or psychology; (2) the field, which decides which works will be selected from among the many works created; and (3) the person, the one who brings the idea or product into a given field in a given generation or culture. Thus, due to the systems model, a product or an idea that is judged to be creative in one environment (domains or field) might be judged to be ordinary in other environments (domains or fields). Csikszentmihalyi thought that the nature of creativity is context-dependent, and that the interaction among the three factors—domain, field, and person—is important in driving a culture's evolution.

Investment theory of creativity

Sternberg and Lubart (1991, 1992, 1993, 1996) developed the investment theory of creativity, which also recognizes the influences of the environment on the judgment of creativity. They thought that the relation between the individual and environment is just like the relation between an investor and a stock market. Creative individuals, like good investors,

"buy low and sell high". In the market (environment) the persons' original products or ideas might not be considered creative at first, but they try their best to change the judgments of the people in the environment. Then these individuals can sell high. After convincing other people of the creative value of their ideas or products, they keep moving on to their next initially unappreciated idea.

Sternberg and Lubart thought that there are six resources that contribute to creativity: intelligence, knowledge, thinking styles, personality, motivation, and environment. So in this theory, as in Csikszentmihalyis', environment can have a nurturing effect on creativity. Also like Csikszentmihalyi's systems model, Sternberg and Lubart's investment theory addresses the reciprocal relationship between environment and individual. However, the investment theory seems to emphasize the active role of the individual in this interaction.

The interaction of creativity development

Feldman (1988, 1999) thought that interaction of individual and environment is necessary for high level creativity. He mentioned seven dimensions that influence creativity: cognitive process, social and emotional process, family-growing process and current, education and preparation-normal and not normal, the characteristics of the field, social cultural situation and the power, affairs and trend of history.

Vgotsky's social-cultural theory of creativity

Vygotsky conceived of developmental and creative processes as internalization or appropriation of cultural tools and social interaction. Moran and John-Steiner (2005) found that what is usually referred to as creativity in Western psychology involves externalization in Vygotsky's and his followers' thinking. Externalization is the construction and synthesis of emotion-based meaning and cognitive symbols. When these meanings and symbols are expressed they are embodied in cultural artifacts -creative products- that endure over time to be used by future generations. The dynamic constructions that result from externalization are

materialized meanings, composed of shared ideas, beliefs, knowledge, emotions, and culture. Vygotsky thought that the two social processes, internalization and externalization, and the two symbol-based forms, personality and culture, are in dialectical tension with each other. This tension provides fertile ground for the growth of new ideas and creative products. So this internal/external movement becomes cyclical, connecting past to future, and the results of these processes over time contribute to a community's history and culture. Creativity, then, depends on development, and development depends on creativity. The two are interdependent.

A common theme among these theories is the impact of the environment on creativity. Although none of them directly examines cultural effects on creativity, culture is regarded as an aspect of the environment (Cooper & Denner, 1998). We can hypothesize that culture may influence creativity through nurturing the development of creativity as well as through the influence of the social values used in judging creativity. Moreover, environment is a comprehensive concept. From another view, the environmental elements include family, kindergarten, class, school, students' dormitory, any kind of organization, professional association, workplace, community, society, and media world etc. We can also hypothesize that creativity may be impacted in any kind of environment. The models of creativity mentioned above have also another similar characteristic, that is, all of them do not divide the different kinds of environmental elements into concrete sub-elements and they also make no difference between environment and culture. Although all of the theories emphasize the importance of the interaction between individual and environment, few of them describe the process and mechanism of the person-environment interaction. About creativity, most of the theories include the basic value of intelligence-knowledge system (domain-relevant skills in Amabile's model, the elements of intelligence, knowledge in Sternberg and Lubart's model) and the dynamic system (thinking styles, personality, motivation in Sternberg and Lubart's model and creativity relevant skills and task motivation in Amabile's model). Few of them

concern themselves about the impact of spiritual and biological elements in their models. Because of such kind of weakness mentioned above, the new model of creativity, the Cultural Pyramid Model of Creativity, is to be constructed.

Cultural Pyramid Model of Creativity

In the Cultural Pyramid Model of Creativity (CPMC), the necessary elements and their interactions are concerned. Figure 1 is the visual view of the new model CPMC. First of all, the pyramid consist of the creativity itself and three other main resources and influence elements, that is, mind, spirit and body. And the cultural or environmental globe surrounding the pyramid is divided into three levels - individual, relational and collective. There are interactions between the three levels.
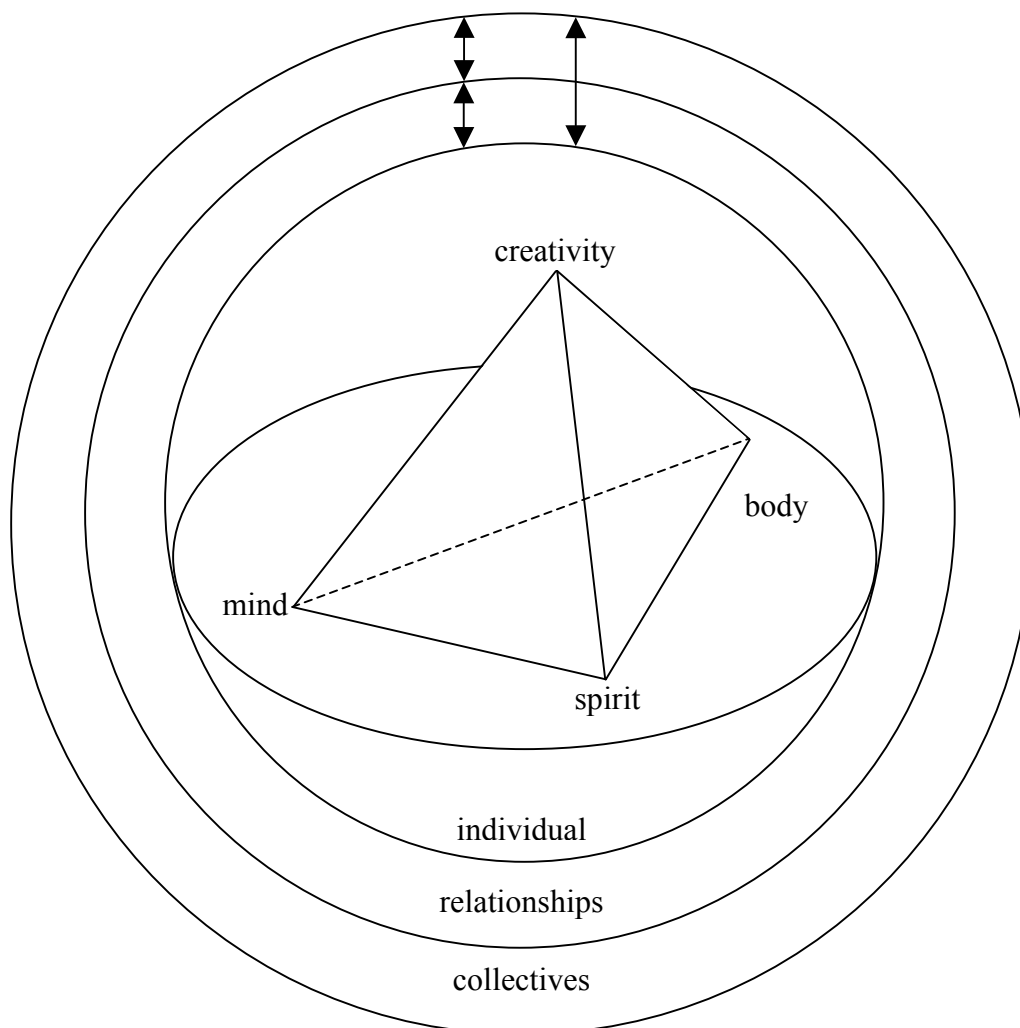
Figure 1. Cultural Pyramid Model of Creativity (CPMC).

In this model there are two parts. One part is the pyramid of creativity, which is impacted by three elements - mind, spirit and body. And the other part is the cultural globe that is divided into three levels according to the cultural characteristics. There are interactions not only between the three levels of the cultural globe, and between the four elements of the pyramid of creativity but also between the globe and the pyramid, so the pyramid is called the cultural pyramid. Each part of the pyramid can be influenced by the cultural or environmental background of a person.

The pyramid of creativity

In the part of the pyramid of creativity, the part of mind consists of two elements - the intelligence-knowledge part and the dynamic part. Concretely, the intelligence- knowledge part refers to the basic part of creativity, such as intelligence, knowledge in some professional field (domain-relevant). The dynamic part is related to personality, motivation, emotion, thinking style and so on. Intelligence is positively associated with creativity, which is based both on investigations using standard intelligence tests as well as more indirect case study or biographical measures (Suedfeld, 1985; Simonton, 2005). It is rare to be outstanding creators without first acquiring a sufficient amount of domain-specific knowledge and then becoming an expert in some field (Ericsson, 1996). About the relations between personality, motivation, emotion, thinking style and creativity there are many studies (Amabile, 1982ab, 2003, 2004; Sternber & Lubart, 1991, 1992, 1993, 1996; Averill, 2005; Simonton, 2005), which confirm the effect of confluence from the independent variables to creativity. Actually, the function of these independent variables is dynamic and also crucial to creativity.

Firstly, Spirit in the pyramid of creativity refers to the religious or quasi religious and aesthetic experiences, which are necessary not only in domains such as philosophy, science or other fields, but also in a domain such as art creation. The two kinds of experience make one have a feeling that the world is in order or will be in order. The experiences give the creators

or potential creators such kind of self-confidence, that is, the world in order can be known, described or constructed by the power of a human being. The other part of the spirit is critical thinking and problem awareness, which can make one keep an open mind to search the meaningful problems and try to best solve them.

The body in the pyramid of creativity is related to the biological condition of creativity. The findings in neurology support that the function of brain impact the creativity expression and innovation (Vandervert et al., 2007). It is well confirmed that the increases in efficiency and adaptability of the activities are the result of control routines that are learned in the cerebellum and subsequently feedback to control improved timing and sequencing of the operations of the movement-generating (motor) portions (and other related parts) of the brain's cerebral cortex (e.g., Bloedel et al., 1985; Ito, 1984, 1997; Thach, 1996). These increases in efficiency and adaptability do, in part, lead to automaticity of behavior (e.g., Kihlstrom, 1987). However, they equally lead to the development of creative and innovative cerebellar control routines for the cerebral cortex. The recent study also claimed that working memory, cerebral cortex and cerebellum collaborate to produce creativity and innovation (Vandervert et al., 2007).

The cultural globe

The cultural globe consists of three labels layers. It is developed based on the studies about individualism-collectivism of Hofstede (1980) and the following studies by other researchers (Brewer & Gardner, 1996; Brewer & Chen, 2007). In psychological studies on cultural difference, the distinction between individualism and collectivism has received more and more attention as a fundamental dimension of cultural variation. In most Western cultures, such as the United States, the main self-concept is defined based on individual-oriented and separation from others. On the contrary, in Eastern cultures, such as the People's Republic of China, the self-definition is based on interdependence with others and more

collective-oriented (Markus & Kitayama, 1991; Oyserman et al., 2002). However, there is

also much criticism on the ill-defined construct of individualism-collectivism and some

studies also demonstrated that the "catchall" construct can not represent all forms of cultural

differences. So some researchers (such as Brewer & Gardner, 1996) have proposed a new

theoretical framework that consisted of individual, relational, and collective three elements. It

seems to contribute conceptual clarity to interpretation of past studies on individualism and

collectivism. This new framework is used in the present construct of creativity.

In the globe of CPMC, the culture (environment) is divided into three levels. The

"individual" level refers to the own self world. The "relationship" level is related to all kinds

of close or interpersonal relationships, such as family, kinship, kindergarten, class, school,

workplace, students' dormitory etc. The "collective" level includes community, any kind of

organization, professional association, media world and the whole society and so on. In this

kind of environment people have generally no direct interaction. And it is the world they live

and work in. Of course, the three layers of cultural globe interact with each others. The impact

on all of them is the environment (culture) of mind, spirit, body and especially creativity

development. Moreover, individual development or creativity, such as great invention or

discovery can change the whole culture (environment) as well. So the cultural globe and the

pyramid of creativity have also interactions.

The interaction between pyramid of creativity and cultural globe

On the one hand, there are intensions between the three layers of the cultural globe

and the four elements of the pyramid of creativity. They have direct relationships. Concretely,

any level of cultures will impact the intelligence-knowledge system, spiritual characteristics,

shaping process of body, and development of creativity. On the other hand, it is proposed that

between the three layers of the cultural globe there are tension, especially between individual

and group (relationship, collective). If the tension between individual and group is proper,

then the creativity and the other three elements will have a proper developmental environment

or life-space, and then a person's creativity develops or creative expression and the

development of other three elements will be smoothly. Generally, that means that the tension

has a nurturing effect on creativity development. On the contrary, if the tension is too big or

too small, that will inhibit the development of creativity. Because of the interaction between

the three variables, the tension not only depends on the interaction between individual and

group but depends on the interaction between relationship and collective level. Finally, the

individual can also contribute to three kinds of cultural layers with their own creative

productions or ideas. The contribution to each layer of the cultural globe depends on the need

of contemporary environmental needs and the level of the creativity. Some can change a

family or a factory, some can bring a new paradigm or Zeitgeist, some can get a revolution

and refresh a party or a country, and some others can also change the whole world.

As we mentioned above, in the globe of CPMC, the culture (environment) is divided

into three levels, the level of "individual", "relationship" and "collective". At each level the

individual has a belief about the capabilities to solve problems and to produce some kind of

attainments. This kind of belief is the subjective or perceived culture (environment) which can

directly influence the individual's expression of creativity. So self-efficacy is supposed to be

the self belief of the ability and collective-efficacy is supposed to be the collective belief of

the ability (Bandura, 1986, 1997). They will be introduced in the following.

Self, collective -efficacy

Self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses

of action required to produce given attainments" (Bandura, 1997, p. 3). The construct of self-

efficacy is one core theoretical point of Bandura's social-cognitive theory (Bandura, 1977,

1997, 2001). Some researches suggest that a high level self-efficacy is related to better

mental, physical health and easier social adaption (Schwarzer, 1992; Bandura, 1997). General

self-efficacy (GSE) aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Schwarzer, 1992; Schwarzer, 1999).

The General Self-Efficacy Scale, developed to measure this construct at the broadest level, has been adapted to many languages (Scholz et al., 2002; Luszczynska et al., 2005). The psychometric properties of this instrument were examined among 19,120 participants from 25 countries. The previous findings confirmed that the dimension of the measure is equivalent across cultures, that is, it corresponds to only one dimension. The results also pointed to a number of cross-cultural differences, specifically, Japanese and Hong Kong Chinese displayed the lowest levels of GSE. The Chinese females were found to be significantly lower in GSE than males. The authors supposed that self-efficacy may be rated lower in collectivistic cultures than individualistic cultures. The Chinese were regarded as less individualistic than Westerners, so the researcher thought that it would be interesting to compare their scores in future studies with corresponding levels of collective self-efficacy (Bandura, 1995; Schwarzer et al., 1997).

Klassen (2004) reviewed critically much of the research investigating self-efficacy beliefs through cross-cultural comparison. Two sets of cross-cultural comparison groups were examined: Asian (or immigrant Asian) versus Western, and Easten European versus Western European and American groups. Almost all of the 20 studies reviewed found efficacy beliefs to be lower for non-Western cultural groups, but in some cases these lower beliefs were more predictive of subsequent functioning. There is some evidence that the mean efficacy beliefs of a cultural group are modified through immigration or political changes. For some non-Western groups, collective efficacy appears to operate in much the same way as self-efficacy operates for Western groups. Realistics -as opposed to optimistic- efficacy beliefs do not necessarily predict poor performance for all cultural groups, as has been suggested by self-efficacy theory. Only a minority of researches included measurement of cultural dimensions

such as individualism and collectivism, although most researches based conclusions on assumed cultural differences. In some cases, self-efficacy was poorly defined and bore little resemblance to theoretically derived definitions. Conclusions from this study have implications especially for applied settings in education and business: Efficacy beliefs and performance appear to be enhanced when training approaches are congruent with the individual's sense of self. Lower levels of self-efficacy beliefs found in some collectivist groups do not always signify lower subsequent performance, but are instead reflective of a differing construction of self.

People do not live their lives in social isolation. They frequently need a collective effort in the face of difficulties and challenges. Bandura (1986, 1997) defined a group-level self-efficacy belief - collective efficacy - as "shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477) and he supposed that the collective efficacy is rooted in self-efficacy, so that research on personal efficacy does not necessarily reflect an individualistic bias in psychology. Bandura (1986) thought that the strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort. So we can say that there are different levels of collective efficacy. Previous studies have investigated the collective of classroom, school, work department, sport team, and cultural group etc (Bandura, 1997).

The researchers have found disparities in the ways in which collective or group efficacy operate across cultures (Klassen, 2004). For example, for collectivists, group or collective beliefs also appear to be key motivational components that foster achievement. Earley (1993) found that managers who came from generally collectivist cultures appeared to express the highest levels of efficacy beliefs (and performance) when they believed they were working with an in-group. Conversely, managers from a predominantly individualist cultural

background performed best, and expressed the highest self-efficacy beliefs, when they believed they were working alone. Earley's study (1994) also indicated that group-level training was most effective for improving expectations, effort, and performance in managers with a collectivist orientation whereas managers from an individualist cultural orientation benefited primarily from individual-level instruction.

In the present dissertation, the new Creativity Self-Efficacy Scale will be developed. Together with the General Self-Efficacy Scale, both of them would be the assessment of self-efficacy. And Cultural Efficacy Scale will also assess the collective efficacy in Chinese and German students. Self- and collective efficacy could probably be important perspectives to check the characteristics of individualism-collectivism.

Objectives

The main objectives of the present dissertation are to explore the expression and development of creativity and general self-efficacy, creativity self-efficacy and cultural efficacy, moreover, their macro- and micro- cultural or environmental influence. First of all, German and Chinese students will be sampled to attend an experiment about artistic creativity. Then the effect of cultural, age, and gender will be analysed. Secondly, the Chinese students in elementary and secondary school will be recruited to complete a general test of creative thinking - Bejing Test of Creative Thinking (BTCT) - , which is to be developed in the present study. At the same time, the creative organizational climate of the school will be assessed. The relations between climate of school and creativity development of students would be analyzed in the study, the aim is to explore whether the climate of school has relations with creativity development of the students or not. Moreover, the characteristics of German and Chinese students' general self-efficacy, creativity self-efficacy and cultural efficacy will be compared and the cultural effect will also be compared. Lastly, the creative organizational climate of school and the teachers' general self-efficacy, creativity self-

efficacy and cultural efficacy will also be explored. Generally, the dissertation is to explore

cultural difference of creativity, efficacy, and their environmental influence.

Outline of the Dissertation

The structure of the empirical chapters is demonstrated in Figure 2. To test several

assumptions of the Cultural Pyramid Model of Creativity, experimental and cross-sectional

designs were carried out. Artistic creativity was investigated by assessing participants of

Caucasian-Germans, Asian-Germans, Chinese studying abroad and domestic Chinese.

Chinese students and teachers of elementary and secondary schools were recruited in General

creativity. The particular studies will be introduced shortly in the following.

cross-cultural comparison	creative organizational climate	
Chapter 2	**Chapter 4**	general creativity (verbal and figural)
artistic creativity (visual art)		
Chapter 3	**Chapter 5**	

general self-efficacy, creativity self-efficacy and cultural efficacy
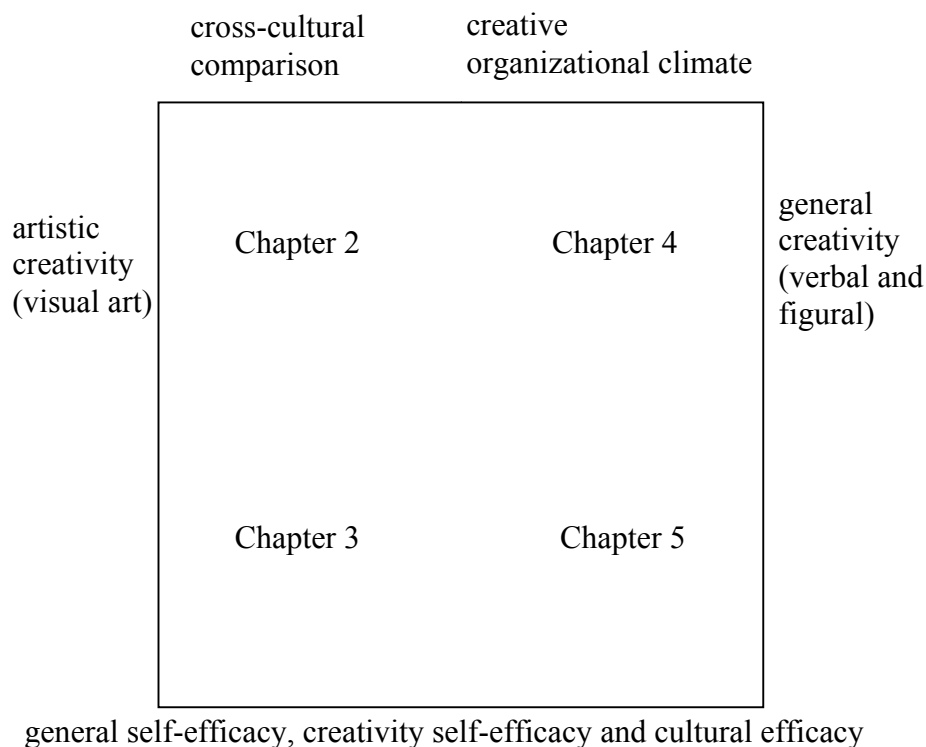
Figure 2. Structure of the empirical chapters.

Chapter 2 is related to the cultural difference in artistic creativity between German

and Chinese students, and the influences of bi-culture and bilingualism on artistic creativity.

The researched questions were what kind of cultural experience might be better for people's artistic creativity and its expression. Are people who have two or more cultural experiences like students abroad or immigrants more creative than those who have only one cultural experience? Lastly, the objective was to compare subjective criteria for judging artistic qualities of artwork between Germans, Chinese studying abroad and domestic Chinese.

The participants included Caucasian-German, Asian-German, Chinese abroad and domestic Chinese students. They were invited to finish two artistic tasks, that is, emotional collage design and alien drawing. The Consensual Assessment Technique (CAT) of creativity research (Amabile, 1982ab, 1996; Niu & Sternberg, 2001; Kaufman et al., 2004) was used in judging the artworks which were made by the four group participants mentioned above. The judges consisted of Caucasian-German, Chinese studying abroad and domestic Chinese students. They judged the art works through the eight dimensions (overall creativity, likeability, appropriateness, imagination, artistry, elaboration, and general impression). The inter-judge reliabilities, the effects of cultural experience, task, and gender were analyzed.

In *Chapter 3*, the Creativity Self-Efficacy Scale and Cultural Efficacy Scale was developed, together with the General Self-Efficacy Scale (GSE, Schwarzer, 1992; Schwarzer et al, 1999) to examine the cultural difference on general self-efficacy, creativity self-efficacy and cultural efficacy between Chinese and German students and also to analyze the relations between the three variables. The concerned questions were: Germans with the relative individualistic-oriented cultural experience have higher general and creativity self-efficacy than Chinese? Chinese with the relative collectivistic-oriented cultural experience have higher cultural efficacy than Germans? What about the relations between the three variables of efficacy? Is general self-efficacy the root of collective efficacy?

For the development of the two scales, teachers and students from Chinese middle schools were recruited. The participants for cultural comparisons were the same as in Chapter

1. The psychometric properties of the new scales, the effects of cultural experience, and gender were analyzed.

In *Chapter 4*, the characteristics of creative organizational climate of school and creativity development of children and the relations between them were examined. In this study, the Beijing Test of Creative Thinking (BTCT), which was designed to measure verbal and figural creativity, was developed. The central variables were creative organizational climate, the fluency, flexibility, originality of the verbal and figural creativity, and the elaboration of figural creativity. On the one hand, the developmental trend of climate of school and creativity of children was examined. On the other hand, the influence of climate on the creativity development of children was analyzed.

For the development of scale and the analyzing of the variables, the participants included the teachers and students from Chinese elementary and secondary schools. The psychometric properties of the new scale, the effects of gender, age and school were analyzed.

Chapter 5 is the study of the characteristics of the creative organizational climate of school and the general self-efficacy, creativity self-efficacy, and cultural efficacy of teachers. The study wants to explore the relationships of the four variables in Chinese schools and how the creative organizational climate impacts on the general self-efficacy, creativity self-efficacy and cultural efficacy of teachers. From this view, results also suggested the development of interventions to increase creative organizational climate and general self-efficacy in educational practices.

The participants come from Chinese elementary and secondary schools. The gender, age, teaching subject, school and teaching duration differences of teachers and the Sobel test were analyzed.

Finally, *Chapter 6* summarizes and discusses the findings and implications presented in the previous chapters. These chapters are independent and can be understood without prior

knowledge of the other chapters. Some of the theoretical explanations are discussed in the first chapter, and the empirical findings are outlined in the last chapter. In *Chapter 6,* theoretical implications, suggestions for studies in the future and advice for the cultural or educational practices are laid out.

The *Chapters 2 to 5* were originally written as single papers for publications in scientific journals. Thus, they overlap in some sections, especially in the theory and methodological parts. The dissertation includes a *Summary* in English and German.

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Chapter 2

Cultural, bicultural and bilingual influences on artistic creativity:

A comparison between German and Chinese students

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Abstract

The objectives in the present study, conducted in Germans and Chinese, were: (a) comparison of cultural differences in artistic creativity between German and Chinese, and (b) examining the influences of being bi-cultural and bilingual on creativity, which refers to one's ability to produce novel and appropriate ideas or products. Firstly, the study suggested that the four groups of students examined (German, Asian-German, Chinese studying abroad and domestic Chinese students) differed in their artistic creativity. Culture can directly influence people's artistic creative expression. German participants (Caucasian-Germans and Asian-Germans) produced more creative and aesthetically pleasing artworks than did their Chinese counterparts (Chinese studying abroad and domestic Chinese), and this difference in performance was recognized by both German and Chinese judges.

Secondly, the study showed that there were no significant differences in artistic creativity performance, not only between Asian-German and German, but also between Chinese studying abroad and domestic Chinese. Thus the difference in creativity between German and Chinese students was not related to ethnic background but to cultural novel and appropriate issues.

Finally, the results demonstrated that there was significant difference between German judges, Chinese judges studying abroad, and domestic Chinese judges. These differences were not associated with a preference of artwork from their own cultural background to that from other cultural background. However, in general, the

consensus among Chinese judges regarding what constitutes creativity was similar

among German judges.

Key words

Cultural, bicultural and bilingual influences, artistic creativity

Theoretical and empirical background

The definition of creativity

Although it was very hard to get consent on the definition of creativity, people

reached something of an agreement about what constitutes creativity. A widely used

conception of creativity refers to one's ability to produce ideas or products that are

judged by a group of people to be both novel and appropriate (Lin, 1995, 1999;

Amabile, 1996; Csikszentmihalyi, 1996; Sternberg & Lubart, 1995, 1999).

Specifically, artistic creativity refers to the creativity expressed in any aspects of the

arts, including visual art, music, literature, dance, theatre, film, and mixed media

(Alland, 1977, as cited in Niu & Sternberg, 2001). The present study specifically

focuses on artistic creativity in the visual arts, and in particular, in drawing and

collage-making. The field of art provides a useful way to examine cultural differences

in creativity (Niu & Sternberg, 2001, 2003).

From the consensus definition of creativity we can find that whether ideas or

products are evaluated as creative or not is likely to be influenced by the judges' own

standard, which is related to the judges' own cultural experience, and this cultural

experience stems from the situation the judges live in. Of course, the creators are also

influenced by their living environment and culture. There are mainly two perspectives

to study the extent and process of the environmental impact on individual creativity.

One perspective is to explore the effect of micro environment such as work place,

classroom, family etc on creativity. The other perspective focuses on the relationship

between the relative macro environment such as multicultural experience,

individualism-collectivism culture and creativity.

The environmental influence on creativity

Hunter, Bedell and Mumford (2007) conducted a meta-analysis to exam 42

prior studies in which the relationships between climate dimensions, such as support

and autonomy, and various indices of creative performance were assessed. These

climate dimensions were found to be effective predictors of creative performance

across criteria, samples, and settings. It was found, moreover, that these dimensions

were especially effective predictors of creative performance in turbulent, high-

pressure, competitive environments. However, concerning the influencing mechanism

and the concrete dimensions of micro environment or organization on creativity, there

are few consenting findings.

Amabile and Conti (1999) found that six elements can encourage creativity.

Those were organizational encouragement, supervisory encouragement, work group

support, sufficient resources, challenging work, and freedom. And they also found

that organizational impediments and workload pressure are negative to creativity.

Another research group found that there were four main aspects concerning the

creativity atmosphere in their findings: (a) activation of curiosity, thinking, and action

through stimulating learning and working environments; (b) goal-oriented and

intrinsic motivating settings; (c) an open and trusting atmosphere; and (d) fostering

personal freedom and nonconformity (Preiser, 2006). In another study, it was

demonstrated that perceived pressure for change, expected changeability of the work

processes, and professional stimulation by the expertise of the superior proved to

enhance innovations (Krause, 2004). In Chinese society, the most important elements

of creative organizational climate were found to include seven categories/factors,

organizational idea, working style, resource availability, teamwork operation,

leadership efficacy, learning and progress, and environmental atmosphere etc (Chiou,

2006).

It is meaningful to assess the work environment to predict the potential for

creativity or innovation in organizations or groups (Mathisen and Einarsen, 2004), but

it is also necessary to explore the internal mechanism of the organizational influence

on creativity, and then proper assessments or interventions can be developed.

Concerning the macro environment influence, culture is the resource where an

individual can learn the judging methods to adapt their lives and make their choices.

Moreover, culture can also have an impact on how creativity is expressed and

evaluated. Like the first researching perspective, there are also few consenting

conclusions about the mechanism and extent of cultural impact.

Some researchers emphasize the social systems, making judgments about an

individual's products (Csikszentmihalyi, 1991), or the cultural influence on the

concept, expression, direction and nurturing of creativity (Lubart and Sternberg,

1998). Urban (2003) thought that the environmental conditions of various systems

may discourage, inhibit, and suppress or nurture, stimulate, inspire, and cultivate

creative processes. Environmental frames influence children's development of

creativity, actual creative processes, and finally the acceptance and appreciation of creative products. But the mechanism is also not clear.

Some researchers focus on the relationship between multicultural or multilingual experience and development or enhancement of creativity. A study about cultural experience and creativity by Angela Ka-yee Leung and her colleagues (2008) showed that multicultural experience increases creative performance and the use of some creativity-supporting cognitive processes. Lakoff and Johnson (cited from Lubart, 1999) indicated that language as the carrier of culture can shape creativity. A review consisted of 24 studies drew the conclusion that most of the studies suggested the significant positive correlations between bilingualism and creativity. It should also be paid attention to that not all of the studies found that bilingual people have better creativity, and there was no consistency in different assessments of creativity. Such as the study of Kaufman and his colleagues (2004) found bilingual superiority on all of the writing tasks. Ricciardelli (1992) thought that there could be a limit of skilled extent of bilingualism. When bilinguists can really be involved in both cultures, then they can express superiority of creativity (Lubart, 1990, 1999).

Some other researchers pay more attention to the impact of individualism-collectivism or different Eastern-Western social values on creativity. Many cross-cultural comparisons are used to explore whether and how culture influences creativity. The results of these researches were not consistent, especially the cultural comparisons between studies in Eastern and Western societies.

Niu and Sternberg (2001) conducted an experiment to compare the rated creativity of artworks created by American and Chinese college students and the judging criteria used by students. The study demonstrated that the two groups of students differed in their artistic creativity. American participants produced more creative and aesthetically pleasing artworks than did their Chinese counterparts, and this difference in performance was recognized by both American and Chinese judges. They concluded that an independent self-oriented culture is more encouraging to the development of artistic creativity than is an interdependent self-oriented culture. They thought that other possible explanations, such as differences in people's attitudes toward and motivation for engaging in art activities, or socioeconomic factors might also account for differences in people's artistic creativity.

In another study, Niu and Sternberg (2003) found that Chinese students' creativity was increased when given direct instructions to be creative or guidance on how to be creative. They concluded that three different factors were probably responsible for the discrepancy in rated creativity between Chinese and American students, namely, social values, school pedagogic practices, and educational testing systems. They argued that high-stakes standardized tests could impair the development of students' creativity. Although there was a general tendency for school educators in both China and the United States to overemphasize analytical skills at the expense of the development of creative abilities, in general, the tendency for the Chinese to do so is stronger than it is for the Americans.

Zha et al. (2006) explored the relation between individualism-collectivism culture and creative potential in highly educated adults. Americans displayed significantly higher scores on a measure of creative potential than the Chinese. The result also demonstrated that Americans showed greater individualism and Chinese were more collectivistic. Moreover, Chinese gained significantly higher scores of skill mastery in the domain of mathematics.

Chen and his colleagues (2002) used the Consensual Assessment Technique to examine whether European-Americans and Chinese differ in their creation and evaluation of drawings of geometric shapes. Somewhat different from Niu and Sternberg's results, they found high consensus between European-American and Chinese judges and great similarity in the creativity of drawings generated by the two groups. Judges liked best those drawings they judged as being more creative. The most creative drawings typically involved representations of geometric shapes in contexts (either concrete or abstract). The researchers thought that the results run counter to the belief that there are wide cultural variations in the evaluation of and attitudes toward creativity, demonstrated the feasibility of cross-cultural comparisons with the Consensual Assessment Technique.

Zhou and his colleagues (1995) found that on the dimension of productive thinking, normal and supernormal Chinese children achieved significantly higher scores than German children. The results suggested also that supernormal children in both countries were more creative than normal children during the three years of study. In the three years the incremental changes of German children were better than

those of Chinese children. They concluded that the higher scores of Chinese children were probably related to the Chinese characters which are more visualized than German writing. Hu and his colleague created a Scientific Creativity Test for Adolescents (SCTA) to compare the scientific creativity of British and Chinese adolescents (Hu, 2001; Hu & Adey, 2003). He found that Chinese adolescents' creative problem solving ability was evidently superior to that of British adolescents. But British adolescents' other scientific creativity of 6 aspects and the entire scientific creativity was evidently superior to that of Chinese adolescents. Moreover, there were marked differences in scientific creativity among students in different kinds of schools. Key-middle-school- subjects' scientific creativity was evidently superior to that of ordinary-middle- school-subjects. Hu concluded that probably seven reasons may explain why the scores of scientific creativity of Chinese adolescents were lower than British adolescents. The authors thought that the reasons could consist of traditional culture, social environment, family education, science curriculum, science instruction, examination method, and science teachers. This list includes almost every side of cultural impact, so it does need more study to clear up the relationship between the environmental variables and creativity expression.

Shen and Lin (Shen, J., & Lin, C., 2007) revised the Scientific Creativity Test for Adolescents (SCTA) of Hu and Adey (2002) to compare the scientific creativity of British, Japanese and Chinese adolescents. They found that: (1) The score on the dimension of Creative Thinking of Chinese and Japanese adolescents was significantly higher than for the British ones, and there was no significant difference

between Chinese and Japanese adolescents. (2) The scores on the dimensions of

Fluency, Flexibility, Problem Raising and Scientific Imagination of Chinese

adolescents were significantly higher than British and Japanese ones, and there was

no significant difference between British and Japanese adolescents. (3) Concerning

the scores on the dimension of Production Design, Chinese adolescents gained the

lowest score, the Japanese scored in the middle, and the British had the highest score.

(4) The scores on the dimensions of Originality and Problem Solving of Japanese and

Chinese adolescents were significantly higher than for the British, and there was no

difference between Japanese and Chinese adolescents. (5) The score on the dimension

of Improvement of Production of Chinese adolescents was significantly lower than

the British and Japanese scores, and there was no significant difference between

British and Japanese adolescents. Researchers drew the conclusion that, firstly, during

the educational reform and the popularization of the Internet the Chinese adolescents

became more creative than before; secondly, probably Chinese participants were

better at doing paper-pencil tests than the British and Japanese, so they showed better

performance on the dimensions of Problem Raising, Problem Solving and Scientific

Imagination. Furthermore, on the dimension of Design and Improvement of

Production, Chinese participants were not as good as the Japanese and British

counterparts. They also thought this was confirmed by the lack of drawing ability and

the problem solving ability in real world. They found that Japanese and British

participants could draw more novel and practical productions than Chinese

counterparts. So this point demonstrated that probably there was some kind of relation between artistic creativity and scientific ability.

From the studies mentioned above we can find that there were few consenting findings between the different studies. Some researchers found that the Chinese were more creative, and some found that Germans or Americans were more creative. The explanations about the reason of superior creativity are also different. Some researchers thought individualistic culture was better than collectivistic culture for the development of creativity. Some researchers thought the multicultural experience was more meaningful for the enhancement of creativity, no matter whether of the individualistic or collectivistic type. Some others thought the micro environment such as organizational climate at the workplace, school or kindergarten was more important.

This study

On the one hand, the aim was to explore to which extent cultural experience might influence people's artistic creativity. On the other hand, we want to study if those people who have two or more cultural experiences, like students abroad or immigrants, are more creative than those who have only one cultural experience. Due to these questions the four different participant groups of German, Asian-German, Chinese studying abroad and domestic Chinese were recruited for the experiment. Finally, the objective was to compare German, Chinese studying abroad and domestic Chinese along subjective criteria for judging artistic qualities of artwork, which were made by the four group participants mentioned above.

Based on these main objectives and the previous studies, there were three related hypotheses. German culture is to be more individualistic than Chinese culture and Chinese culture is found also relatively more collectivistic than German culture (Hofstede, 1980). Concerning the findings and claims of Niu (2001, 2003) that individualistic culture is better for the development of creativity, we first predicted that between the participants from two cultures German artworks would be more creative than Chinese artworks. Due to the findings and proposals of Lubart (1990, 1999) about the superiority of creativity of bilingual or bicultural individuals, we secondly predicted that those who have bicultural or bilingual experiences were more creative than those who have only one cultural experience. Specifically, in the respective culture, we supposed that Asian-German artworks would be more creative than Caucasian-German artworks; Artworks of Chinese studying abroad would be more creative than domestic Chinese artworks. The third hypothesis was that there would be an interaction in judging among the groups of judges and the nationality of the artwork. Particularly, people would judge artworks from their own culture to be more creative, and they would also judge the likeability of artworks from their own culture as superior to artworks from other cultures.

Method

Participants

The participants included 45 German Students (Federal Republic of Germany citizens) from Free University of Berlin and other German Universities, and 61 Chinese Students (People's Republic of China citizens) from Chinese and German

universities. German participants were recruited through advertisements placed in dining halls or on the Internet (www.StudieVZ.de). There were 29 German students and 16 Asian-German students, all of whom had no study experience abroad. Chinese participants were recruited also through advertisements placed in dining halls or from the beginning of summer school for Chinese students in Berlin etc. Of the Chinese participants, 31 students studying abroad were from Free University of Berlin and Humboldt University of Berlin. All of them had previously studied in one of the Chinese universities and now study in one of the German Universities. The other 30 domestic Chinese students were from Tsinghua University Bejing, Tongji Univerity Shanghai. As the German students, at this time they also had no experience of study abroad.

The German participants consisted of 26 women and 19 men. Caucasian-Germans consisted of 17 women and 12 men, and Asian-German consisted of 9 women and 7 men. The Chinese participants included 30 men and 31 women. Chinese studying abroad included 8 men and 23 women, and domestic Chinese included 22 men and 8 women.

The mean age of the German participants was 24.25 years (age range from 19 to 36 years of age, $SD = 3.48$) and for the Chinese it was 24.52 years (age range from 20 to 42 years of age, $SD = 3.88$). The mean age of Caucasian- German participants was 24.96 years (age range from 19 to 36 years of age, $SD = 3.86$) and for the Asian-Germans it was 23.14 years (age range from 20 to 29 years of age, $SD = 2.51$). The mean age of Chinese studying abroad participants was 26.64 years (age range from 22

to 42 years of age, *SD* = 4.15) and for the domestic Chinese it was 22.53 years (age

range from 20 to 29 years of age, *SD* = 2.24).

As mentioned above, the ethnic background of the German students was: 29

Caucasian-Germans and 16 Asian-Germans. In the Asian-Germans there was 1

Vietnamese-German, 2 Hongkong-Chinese-Germans, and 13 Mainland-Chinese-

Germans. Most of them (N = 14, 87.5%) fluently spoke the Asian mother tongue of

their parents at home. 12 of them were 2nd generation Germans and 4 of them were

3rd generation Germans.

All Chinese participants were Chinese natives. Chinese studying abroad have

been in Germany from 2.5 months to 66 months (mean = 19.3 months). 18 of them

spoke fluent German. 7 of them had learned German for one semester in China before

they came to Germany, and 6 of them had learned German for two months in China

before they came to Germany.

The first author, a male native-Chinese student, conducted both the German

and Chinese parts of the sampling.

Materials

Artistic creativity assessment tasks. In order to balance the effect of previous

training or knowledge on artistic creativity, *two* tasks for the experiment were

selected. The tasks were (a) making a collage as exemplified by Teresa Amabile's

(1982) series of studies about the influence of social condition on artistic creativity,

and (b) drawing an extraterrestrial alien, originally used in Thomas Ward's (1994)

series studies on creative cognition. The principles used to select two tasks were the same like Niu and Sternberg's (Niu & Sternberg, 2001).

Translation and back-translation. All instructions were written at first in Chinese. Then they were translated into German by the first author, a Chinese native, and then the instructions were checked and modified by a native German. The German instructions afterward were back-translated by another native Chinese speaker who was fluent in both German and Chinese. For items about which there was disagreement, a native Chinese speaker was consulted to compare the items in the two versions. A final version was based on the agreement of these four people (all of them were psychology students).

Procedure and experimental treatments

After receiving consent from the participants, the materials for the experiment were given or sent to participants in each country. The instruction for students to make collage designs was:

"We would like to ask you to help us by making a collage design, which relates to different kinds of emotions. Our purpose for collecting these designs is to investigate how students depict emotions through collages. It is not important whether or not you have any art training, and you don't need to sign your name. Please select one topic you are interested in from the following four topics, and make a collage to represent this topic. Feel free to use the materials we provided; you can use as much or as little material as you like in your design, but please use only these materials.

The four kinds of emotions that you can choose are: Happy, Sad, Angry and Frightened (please mark the one you want to describe)."

The instruction for students to make collage designs was:

"Please draw an extraterrestrial alien according to your own ideas."

They finished the artworks at home or in a quiet classroom at university. There was no time limit for creating the artworks.

Judges and judging process

The judges, consisting of 21 German and Chinese students were recruited to judge all of the artworks. They were seven German students from Freie University of Berlin, including four men and three women (with an age range from 22 to 27 years and a mean of 25.10 years), seven Chinese students studying abroad, from Free University of Berlin and Technical University of Berlin, who previously have finished their Bachelor's study in China, including four men and three women (with an age range from 20 to 35 years and a mean of 29.54 years), and seven domestic Chinese students from Zhejiang University, including four men and three women (with an age range from 22 to 31 years and a mean of 24.19 years).

At first we collected all of the artworks from the participants in Germany and China, and then we scanned all of the collage designs and aliens into a computer and translated the artworks into PPT files (via Microsoft Powerpoint software). Every judge looked at the collages and aliens in a prearranged order. Judges were told that all the designs/pictures were made by students, who used the same materials. Then the

judges were asked to judge subjectively all of the artworks for the following eight

dimensions:

1. creativity (the degree to which the work is creative),

2. likeability (the degree to which you like it),

3. appropriateness (the degree to which the work represents the required

   topic),

4. technical quality (the degree to which the work is technically good),

5. imagination (the degree to which the producer's imagination is prolific),

6. artistic level (the degree to which the work is artistic),

7. elaboration (the degree to which the work is elaborate),

8. general impression (the degree to which you synoptically judge the work).

The judges were instructed to evaluate all artworks relative to one another on

each aspect and to grade each artwork on a 7-point scale. They were asked to look at

all the artworks before they started their judging.

The Consensual Assessment Technique mentioned above and used in the

present study has been validated by other researchers in creativity research (Amabile,

1982, 1996; Niu & Sternberg, 2001, 2003; Chen et al., 2002, Kaufman et al., 2004).

Results

Inter-judge reliabilities

An inter-judge reliability assessment was conducted to see whether the subjective judgings were at an acceptable level or not.

The inter-judge reliabilities were measured by using Cronbach's coefficient alpha standardized with SPSS 13.0. From each group of judges, sixteen reliability coefficients were calculated for each of the eight dimensions (overall creativity, likeability, appropriateness, imagination, artistry, elaboration, and general impression) for both experimental tasks (collage making and alien drawing). All of the reliability coefficients were acceptably high (most of the reliabilities scores were actually above .70), and the six reliability coefficients for the creativity judging of the artworks were all above .56 (see Table 1).

There were no significant differences among the reliability scores derived from the three judging groups. For the test of significance of the reliability coefficients among the three groups, the Statistics Software for Meta-Analysis version 5.3 from Ralf Schwarzer was used (Schwarzer, 1989). All of the dimensions among different groups of judges were not significant (see Table 1). This result suggested that on the question of what is creative, German judges, Chinese judges studying abroad and domestic Chinese judges may have almost the same opinion in respective groups.

Table 1

Inter-rater reliabilities among different groups of judges for different dimensions in experiments of collage making and alien drawing

Collage making	Creat	Like	Appr	Tech	Imag	Art	Elab	Gene
German (N = 7)	.61	.58	.78	.70	.71	.66	.74	.63
Chinese abroad (N = 7)	.56	.65	.80	.63	.55	.54	.63	.65
domestic Chinese (N = 7)	.73	.57	.59	.71	.74	.66	.74	.66
Chi square (df = 2)	.19	.04	.42	.05	.25	.09	.12	.00

Alien drawing	Creat	Like	Appr	Tech	Imag	Art	Elab	Gene
German (N = 7)	.82	.77	.79	.82	.78	.80	.86	.83
Chinese abroad (N = 7)	.75	.78	.78	.83	.75	.67	.84	.81
domestic Chinese (N = 7)	.76	.76	.67	.76	.79	.71	.81	.77
Chi square (df = 2)	.08	.00	.16	.08	.02	.18	.06	.06

Note. The numbers indicate the reliabilities of the judges on each dimension. Creat = creativity; Like = likeability; Appr = appropriateness; Tech = technical quality; Imag = imagination; Art = artistic level; Elab = elaboration; Gene = general impression. The following is the same as well.

The effect of cultural experience

At first, a MANOVA was conducted to test cultural differences in the eight dimensions of artistic creativity. Very significant cultural differences were found, $F(8, 89) = 3.66$, $p < .01$. Results suggest that the German students (mean = 4.36) obtained

significantly higher scores than the Chinese Students (mean = 4.12) in eight evaluated

dimensions of artistic creativity.

Following, a Univariate ANOVA was conducted. In this 4 (Cultural

experience) $\times$ 2 (Gender) $\times$ 2 (Task) $\times$ 3 (Judge group) $\times$ 8 (Dimension of

judgment) ANOVA, a significant main effect of cultural experience was found, F (3,

381) = 37.92, $p < .001$. The result showed that there was significant difference among

the four groups of cultural experiences. Specifically, to compare the influences of

different respective cultural experience on creativity performance, a one-way

ANOVA was used. The results suggested that there was no significant difference

between the German and Asian-German students (the former mean = 4.37 and the

latter mean = 4.35), $t = .44$, $p = .66$. Moreover, there was also no significant

difference between the Chinese studying abroad and domestic Chinese students (the

former mean = 4.11 and the latter mean = 4.05), $t = 1.66$, $p = .10$. The two

comparisons were both significant on all of the eight evaluated dimensions, regardless

of the type of tasks and the nationality of judges (see table 2).

A significant main effect of Judge was also found, $F(2, 382) = 195.14$, $p <$

.001, showing that Chinese judges studying abroad were inclined to give higher

ratings (mean = 4.26), on average, than did the domestic Chinese (mean = 4.22) and

the German judges (mean = 3.68) (see table 2). We did not find the interaction of

Cultural experience $\times$ Judge, $F = 1.81$, $p = .09$, suggesting that the judges did not

favour the artwork from their own culture over that from the other culture.

Table 2

Comparison of artistic creativity and other artistic qualities of German, Asian-German, Chinese studying abroad and domestic Chinese participants' artwork in Experiments of Collage making and alien drawing

Collage making	Caucasian -German	Asian- German	Chinese studying abroad	Domestic Chinese	Total Mean
Creativity					
German judge	4.45	4.65	4.35	3.88	4.28
Chinese judge abroad	5.15	5.14	5.13	4.93	5.08
Domestic Chinese judg	4.85	4.72	4.64	4.48	4.66
Judge mean	4.82	4.83	4.71	4.43	4.67
Likeability					
German judge	4.01	4.19	4.16	3.60	3.96
Chinese judge abroad	4.49	4.65	4.41	4.45	4.48
Domestic Chinese judg	4.18	4.33	3.92	3.90	4.04
Judge mean	4.23	4.39	4.16	3.99	4.16
Appropriateness					
German judge	4.07	4.51	4.01	3.89	4.06
Chinese judge abroad	4.27	4.52	4.41	4.54	4.43
Domestic Chinese judg	4.15	4.45	4.08	4.21	4.19

Judge mean	4.16	4.49	4.17	4.22	4.23

Technical quality

German judge	4.18	4.32	3.86	3.53	3.91
Chinese judge abroad	4.74	4.75	4.52	4.25	4.53
Domestic Chinese judg	4.43	4.51	3.95	3.80	4.11
Judge mean	4.45	4.53	4.11	3.86	4.18

Imagination

German judge	4.43	4.50	4.31	3.80	4.22
Chinese judge abroad	5.42	5.33	5.25	5.06	5.25
Domestic Chinese judg	4.70	4.64	4.45	4.23	4.47
Judge mean	4.85	4.83	4.68	4.37	4.65

Artistic level

German judge	4.19	4.38	4.10	3.61	4.02
Chinese judge abroad	4.66	4.80	4.59	4.42	4.59
Domestic Chinese judg	4.40	4.61	4.15	3.84	4.19
Judge mean	4.41	4.60	4.29	3.96	4.27

Elaboration

German judge	3.82	3.99	3.53	3.10	3.54
Chinese judge abroad	4.66	4.70	4.42	4.23	4.47
Domestic Chinese judg	4.41	4.67	4.06	3.91	4.19
Judge mean	4.30	4.45	4.00	3.74	4.07

General impression

	Caucasian-German	Asian-German	Chinese studying abroad	Domestic Chinese	Total Mean
German judge	4.10	4.35	4.11	3.70	4.02
Chinese judge abroad	4.80	4.83	4.70	4.62	4.72
Domestic Chinese judge	4.46	4.63	4.27	4.09	4.32
Judge mean	4.45	4.60	4.37	4.14	4.36
Total mean	4.46	4.60	4.37	4.14	4.36

Alien drawing

	Caucasian-German	Asian-German	Chinese studying abroad	Domestic Chinese	Total Mean
Creativity					
German judge	4.18	3.91	3.69	3.90	3.90
Chinese judge abroad	4.84	4.74	4.54	4.71	4.70
Domestic Chinese judge	5.10	4.63	4.74	4.68	4.80
Judge mean	4.71	4.43	4.32	4.43	4.47
Likeability					
German judge	3.82	3.46	3.37	3.39	3.50
Chinese judge abroad	4.50	4.28	4.24	4.30	4.33
Domestic Chinese judge	4.34	3.95	3.90	3.83	4.00
Judge mean	4.22	3.90	3.84	3.84	3.94

Appropriateness

German judge	4.59	4.69	3.85	4.03	4.21
Chinese judge abroad	4.43	4.66	4.03	4.33	4.31
Domestic Chinese judg	4.75	4.62	4.24	4.35	4.45
Judge mean	4.59	4.66	4.04	4.24	4.32

Technical quality

German judge	3.70	3.56	3.38	3.42	3.50
Chinese judge abroad	4.17	4.06	3.80	3.90	3.96
Domestic Chinese judg	3.99	4.00	3.79	3.89	3.90
Judge mean	3.95	3.87	3.66	3.74	3.79

Imagination

German judge	3.83	3.64	3.70	3.76	3.74
Chinese judge abroad	4.84	4.80	4.40	4.71	4.66
Domestic Chinese judg	4.80	4.36	4.45	4.44	4.52
Judge mean	4.50	4.27	4.19	4.30	4.31

Artistic level

German judge	3.63	3.58	3.38	3.49	3.50
Chinese judge abroad	4.27	4.13	3.95	4.05	4.09
Domestic Chinese judg	3.98	3.85	3.75	3.81	3.84
Judge mean	3.96	3.85	3.70	3.78	3.81

Elaboration

German judge	3.62	3.27	3.08	3.24	3.29
Chinese judge abroad	4.14	4.08	3.84	3.98	3.99
Domestic Chinese jud;	4.25	3.99	3.82	3.95	3.99
Judge mean	4.00	3.78	3.58	3.72	3.76

General impression

German judge	3.87	3.55	3.41	3.62	3.61
Chinese judge abroad	4.64	4.49	4.23	4.36	4.41
Domestic Chinese jud;	4.50	4.07	4.04	4.07	4.17
Judge mean	4.34	4.04	3.89	4.02	4.07
Total mean	4.28	4.09	3.90	4.01	4.06

Note. For each comparison among the four groups, Caucasian-German, Asian-

German, studying abroad Chinese and domestic Chinese, means differ significantly

at *p* < .01.

A significant three-way interaction was also found, Cultural experience $\times$

Task $\times$ Gender, *F* (3, 381) = 21.17, *p* < .001, indicating that the impact of the cultural

experiences to be creative was different between tasks and genders. Specifically, with

the task of collage-making, in the female group, Asian-German students obtained the

highest score (mean= 4.81), followed by the German students' (mean = 4.46), the

Chinese students studying abroad (mean = 4.33) and the domestic Chinese students'

(mean = 4.19) was the last one. Correspondingly in the male group, German students

(mean = 4.45) were the highest, the second were Asian-German students' (mean =

4.33), the third were Chinese students studying abroad (mean = 4.23) and domestic

Chinese students' (mean = 4.05) the last. However, with the task of alien drawing, in

the female group, German students obtained the highest score (mean= 4.44), the

second were Asian-German students (mean = 3.99), the third were Chinese students

studying abroad (mean = 3.77) and domestic Chinese students' (mean = 3.70) were

the last. Correspondingly, in the male group, Asian-German students (mean = 4.20)

were the highest, the second were German students (mean = 4.09), the third Chinese

students studying abroad (mean = 4.26), with domestic Chinese students' (mean =

4.12) the last.

The effect of task

We also found a significant main effect of task, F (1, 383) = 108.21, $p < .001$,

suggesting that, participants generally obtained much higher scores in their collage

makings (mean = 4.36) than in their alien drawings (mean = 4.07). A significant two-

way interaction Task $\times$ Judge was also found, F (2, 382) = 11.20, $p < .001$,

suggesting the difference in task performance was affected by the three groups of

judges. The other significant interaction were Task $\times$ Gender, F (1, 383) = 49.30, p <

.001, and Task $\times$ Cultural experience, F (3, 381) = 4.48, $p < .005$, and Task $\times$

Dimension, F (7, 377) = 5.67, $p < .001$, suggesting the difference in task performance

was also affected by the gender, the cultural experience of participants, and the

dimension of judgement.

A significant but perhaps only tentative four-way interaction for Task $\times$ Cultural dimension $\times$ Gender $\times$ Judge, $F(6, 378) = 2.59$, $p < .05$, was also found. Considering the numerical comparison in our analysis, this four-way interaction effect might be tentative and less significant, so it might be premature to interpret these findings.

The effect of dimension

We have found a significant effect for dimension, suggesting that the judges rated the artworks differently on the eight dimensions, $F(7, 377) = 35.14$, $p < .001$. Another significant two-way interaction Judge $\times$ Dimension, $F(14, 370) = 3.90$, $p < .001$ was also found, suggesting that except for the dimension of appropriateness, for which Chinese judges studying abroad and domestic Chinese judges set similar standards (with means of 4.37 and 4.32 for the Chinese judges studying abroad and domestic Chinese judges respectively), and the three judge groups had different judging standards on all other dimensions. On all of the eight dimensions German judges set a higher standard than domestic Chinese judges and Chinese judges studying abroad. Domestic Chinese judges set also a higher standard on the other seven dimensions of creativity, likeability, technical quality, imagination, artistic level, elaboration, general impression (see Table 3).

Table 3

Comparison of means of eight dimensions evaluated by three group judges in

Experiments of Collage making and alien drawing

Judges	Creat	Like	Appr	Tech	Imag	Art	Elab	Gene	Total
German (N = 7)	4.09	3.73	4.14	3.71	3.98	3.76	3.42	3.82	3.83
Chinese abroad (N = 7)	4.89	4.40	4.37	4.25	4.96	4.34	4.23	4.57	4.50
Domestic Chinese (N = 7)	4.73	4.02	4.32	4.01	4.50	4.01	4.09	4.24	4.24
Total mean	4.57	4.05	4.28	3.99	4.48	4.04	3.91	4.21	4.19

The correlations of each pair of scores on the eight dimensions of alien

drawing were significant (all above .60, *ps* < .001). And on the eight dimensions of

collage design most of the correlations of each pair of scores were significant, only

four correlations were not significant (between the dimensions of appropriateness and

creativity, appropriateness and technical quality, appropriateness and imagination,

appropriateness and artistic level). However, between alien drawing and collage

design the correlations of each pair of scores on the eight dimensions were not

significant (see Table 4). The results suggested that the criteria people used to judge

artistic creativity and aesthetic qualities were not correlative with each other in the

two tasks. But in the respective task the criteria used in judging were basically highly

related to one another.

Table 4

Correlations among different dimensions of two artworks

Collage making	Creat	Like	Appr	Tech	Imag	Art	Elab	Gene
Collage making								
Crea	1.00							
Like	.59**	1.00						
Appr	-.02	.61**	1.00					
Tech	.80**	.75**	.34	1.00				
Imag	.94**	.54**	-.06	.78**	1.00			
Art	.88**	.73**	.17	.88**	.89**	1.00		
Elab	.71**	.70**	.28**	.92**	.72**	.82**	1.00	
Gene	.72**	.91**	.57**	.87**	.69**	.83**	.82**	1.00
Alien drawing								
Crea	.06	.11	.16	.20	.06	.13	.16	.17
Like	.09	.11	.04	.15	.08	.13	.13	.16
Appr	-.06	.10	.15	.08	-.08	.04	.06	.07
Tech	.06	.08	.07	.15	.04	.11	.17	.13
Imag	.09	.12	.13	.21*	.10	.17	.20	.18
Art	.14	.15	.10	.23*	.13	.21*	.22*	.21
Elab	.05	.05	.08	.14	.00	.09	.15	.10
Gene	.06	.13	.12	.18	.03	.14	.15	.17

Alien drawing	Creat	Like	Appr	Tech	Imag	Art	Elab	Gene
Alien drawing								
Crea	1.00							
Like	.79**	1.00						
Appr	.69**	.71**	1.00					
Tech	.78**	.88**	.65**	1.00				
Imag	.96**	.74**	.66**	.78**	1.00			
Art	.85**	.87**	.66**	.94**	.85**	1.00		
Elab	.78**	.81**	.60**	.95**	.75**	.91**	1.00	
Gene	.92**	.92**	.79**	.91**	.90**	.93**	.88**	1.00

Note. The numbers indicate the correlation of the art products of all the participants

* $p < .05$; ** $p < .01$ (two-tailed).

The effect of gender

We did not find a main effect for gender, $F (1, 383) = .04$, $p = .85$, but a significant interaction Cultural experience $\times$ Gender, $F (3, 381) = 3.90$, $p < .001$ was found. It suggested that the difference in gender was affected by the four cultural experiences. Specifically, the differences of performance between female and male participants were with differences of 0.18, 0.16, 0.19 and 0.14 in the cultural experiences of German, Asian-German, Chinese studying abroad and domestic Chinese.

The effect of age

There is a very small age difference between German (mean = 24.25) and Chinese participants (mean = 24.52). In order to know whether the cultural difference

in performance is partly due to the age factor, we set age as a covariate and conducted a MANCOVA. We did not find an effect of age, $F(8, 81) = .55$, $p = .82$. Therefore, it is safe that we ruled out age as factor in explaining the cultural differences in this Experiment.

Discussion

Can bicultural or bilingual experiences accelerate artistic creativity expression?

The study demonstrated that there were no significant differences of artistic creativity performance, not only between Asian-Germans and Caucasian-Germans, but also between Chinese studying abroad and domestic Chinese. So the second prediction was not confirmed that those who have bicultural experiences were more creative than those who have only one cultural experience. The results do not seem to support the claim of Lubart (1999) of a significant positive correlation between bilingualism, bi-culture and creativity. Of course, the artistic creativity in the present study somewhat differs from the creativity thinking measured by TTCT.

The results also seem to suggest that the difference between German and Chinese students' creativity probably was not due to the students' ethnic background; rather, it is more likely to be attributable to certain environmental factors, such as societal values and school environments. Although Chinese students in China or Germany are not the same as Asian-German students in Germany, they do share a similar ethnic background. Given the small sample size for Asian-German, we view this result as preliminary, and as deserving attention in future studies.

The Chinese studying abroad are often hold themselves a group with international, cross-cultural perspective and higher creativity than domestic Chinese who have no experience studying abroad. Most domestic Chinese people agree with this. From 1872 till now, the policy to send students to study abroad was always an important part of Chinese national strategy of modernization (Yung, 1909; The China Scholarship Council (CSC), 2007). In 1872 in the Qing dynasty there were 30 students with an age range from 12 to 15 years, who were selected as the first group in Chinese history to study abroad in America, financed by the government. 135 years later, in 2007 there was a new program and 3,952 students were selected and financed by the government to study abroad. However, most of them were graduate students, some were doctoral students, and scarcely any of them was under 18 years old. They go to study abroad for one to four years, after which they will go back to China. Based on the findings of this study and if we suppose that studying abroad can accelerate creativity, it is probably not good for their creativity development when they go to study abroad too late and go back too quickly. The process of the cultural impact and the perception of the impact need possibly a longer time. When the students abroad have too little time to experience the other culture, this experience may not be so helpful for the expression and promotion of their creativity.

The other reason for the relatively lower creativity is likely to lie in Chinese education. Niu (2007) reviewed the history of the Chinese traditional educational testing system and its western influence in the twentieth century. She focused on two historical periods, from 1905 to 1949 and post-1980, when western influences were

most vigorous. She concluded that under the influence of various western nations, the structure of Chinese education was fundamentally altered from a focus upon Confucian classics to the inclusion of modern western subject areas, and more recently, a move from knowledge-based tests to aptitude measurements. The reality in present China is that western inspired reforms have impacted upon the everyday lives of Chinese students. In the shadow of the traditional educational testing systems, students lived through the drill of preparing for various exams, all of which culminated in the National College Entrance Exam (NCEE). The ability to combat exam-related anxieties, and the endurance developed over years of exam-preparation may help Chinese students excel in exams in comparison with their western counterparts. However, as Niu said, an exam-driven knowledge-based education may result in a sacrifice of independent intellectual inquiry and creative thinking (Niu & Sternberg, 2001, 2003; Niu, 2007). Such testing systems also promote homogeneity and may diminish the students' motivation to pursue their own interests rather than exam-related academic work. In the present study the Chinese participants were those who had passed numerous exams. Although some of them have chances to study abroad, it is very hard to raise their creative expression above that of their German or domestic counterparts. Probably the damaged independent intellectual inquiry and creative thinking is difficult in a short time to rehabilitate.

There were many new reforms in the German educational system, too. For example, by promoting top-class university research within the framework of the Initiative for Excellence, the Federal Government is aiming to establish

internationally visible research beacons in Germany (The Federal Ministry of

Education and Research, 2007). Such kind of reform can make a difference between

hundreds of German universities, so there can be some changes in organizational

culture of university in Germany. This change of culture can also impact the creativity

of students. After all, we shouldn't see the excellent organizational culture only in

numbered selected universities, but in each university and in the whole society. In this

study we found that German students have a better expression of creativity. So how to

keep the necessary tradition and renew or optimize the current inadequate system for

creativity development of most students is a serious question for discussion.

Can culture directly influence people's artistic expression?

As our experiment demonstrated, culture can influence people's artistic

creative expression. There is a strong tendency for people in different cultures to

express their artistic creativity in different ways. Generally, German students showed

higher artistic creativity than did Chinese students. Both German and Chinese judges

rated artworks by Germans as more creative than those by Chinese. Therefore, our

first hypothesis was confirmed that German artworks would be evaluated as more

creative than Chinese artworks.

The results suggested that the creativity of German artworks was probably due

to the higher artistic ability of German participants compared with Chinese

participants. Although we introduced some selected measures to control people's

prior artistic knowledge, the study still showed that there might be some differences

between German and Chinese participant's artistic abilities, and this difference might

account for the difference in their artistic creativity. We have also found the

interaction between cultural experience and other variables, especially task. Why did

participants show different performances in the different kinds of experimental tasks?

Probably we should analyze the characteristics of the two art tasks.

Between the participants' scores of two tasks there was significant difference.

Generally, in collage design participants obtained much higher scores than in alien

drawing. According to the explanation of the task of collage design, participants were

allowed to use only the materials provided: 64 stickers of regular shapes (circle,

ellipse, square, hexagon and equilateral triangle etc.) and 70 stickers of pentacles of

the same size, in green, yellow, blue, red colors. If we compare the task of collage

design with the task of alien drawing, we see that in the latter task the participants

made use of a pen to draw any form representing an imaginative figure, and that the

rule of collage design was more restricted. The task of alien drawing was less

restricted with a specific topic and limited material. So participants had more freedom

in drawing the topic, but it was also more difficult to produce with high artistic

creativity. This was probably the first reason why there was a difference between the

two tasks. The other reason was likely to be the difference of the prior experience

about the two tasks. On the one hand, the participants had probably seen many photos

on television, in books, or films, so it was very hard to draw a new picture beyond

what they had seen before. On the other hand, the judges also had many such photos

in mind, so they probably had a higher standard to judge the artworks of aliens than to

judge the artworks of collage. So the scores evaluating the alien were lower than for

the collage designs.

In comparing to another similar study between Americans and Chinese,

American participants obtained also significantly higher scores than their Chinese

counterparts (Niu & Sternber, 2001, 2003). And in their studies Caucasian-Americans

and Asian-Americans were more creative than Chinese, and there was also no

difference between the former two groups. The two studies also confirm each other.

Obviously, from the results of the two studies there were no ethnic factors, which can

impact the expression of creativity. The Asian-American and Chinese have a similar

ethnic background as Chinese studying abroad and domestic Chinese, but between the

two groups there was significant difference. It suggested that generally independent

oriented society was probably better for the expression of artistic creativity than

interdependent oriented society. Although there are also differences between

American and German cultures, we can suppose that the common grounds shared by

them are greater than those shared by Americans and Chinese, or by Germans and

Chinese.

The cross-cultural study conducted by Shen and Lin (2007) found that in some

dimensions of scientific creativity Chinese participants were better than the Japanese

or British counterparts. But why can the Chinese not become even better during the

process of growing up? Probably some Chinese people are also creative when they are

very young, but during more and more interaction between them with some aspects of

social culture, they turn to be not so creative, they become more and more scrupulous.

Conversely, some children from other cultures are not so creative when they are very young. But during the interaction with self-oriented social culture, they can become more and more creative.

Moreover, the results do not seem to support the claims of Zhou and his colleagues (1995) that because the Chinese characters are more visualized than German writing, so Chinese have superiority of visual creativity over Germans. On the contrary, the Germans are found to be superior over the Chinese on both of the artistic tasks. Maybe the function of culture or the testing system is more important than the writing tools. Of course, the tasks in the present study cannot represent all of the visual designs, so more studies are needed to clear up the question.

Can culture influence people's judgment of normal people's artistic creativity?

The study showed significant differences between German judges, Chinese judges studying abroad, and domestic Chinese judges. But as we mentioned earlier, the difference did not mean that judges favour the artwork from their own cultural background over those of other cultural backgrounds. In fact, not only German judges, but also Chinese judges studying abroad and domestic Chinese judges rated German artworks as more creative than Chinese artworks. So the third prediction was not confirmed that there would be an interaction in judging among the groups of judges, and between the German and the Chinese groups of the artwork.

A difference between the rating criteria used by those three groups of judges was that Chinese judges studying abroad and domestic Chinese judges tended to give higher grades on average to all products than by German judges. We attributed this

difference to German judges applying a higher standard to judge artworks due to the apparently higher artistic ability of Germans compared to Chinese. However, it is also possible that the two national groups of judges had different ways of using the 7-point scoring system.

Moreover, we didn't find similar results of the reliability scores that Chinese judges were more in consensus in judging artworks than were American judges. Niu and Sternberg (2001) found that the reliability scores of the Chinese judges were uniformly higher than those of the American judges. Their result suggested that Chinese judges in general may have more consensus in their notion of what is creative than do American judges (Niu & Sternberg, 2001). Actually, German judges were almost equally in agreement in judging as were the Chinese judges, and there was no significant difference. This point probably suggested that the standard in judging of artistic creativity used by German was also different from the American one, although both of them had a stricter standard than Chinese in judging of artworks. So probably the difference of agreement among Germans, Chinese and Americans could reflect an American culture emphasizing individual differences more than German and Chinese do.

The results of our study of artistic evaluation seem to support the results of Haritos-Fatouros and Chid (1977), Niu and Sternberg (2001, 2003). In their studies, people in different cultures adopted similar criteria to judge an artwork. This result was different from the study of Binne-Dawson and Choi (1982), in which people preferred artworks from their own culture. Although our intention was not to study

people's concept of creativity, this specific result seems to reveal that people in

different cultures may have a similar understanding of artistic creativity.

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Chapter 3

The impact of culture on general self-efficacy, creativity self-efficacy and cultural efficacy

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Abstract

The major objectives were (a) development of the Creativity Self-Efficacy Scale and Cultural Efficacy Scale; and (b) examining cultural difference on general self-efficacy, creativity self-efficacy and cultural efficacy between Chinese and German students, and (c) examining the relationships between general self-efficacy, creativity self-efficacy and cultural efficacy. The results demonstrated that the psychometric properties of the two new homogeneous and unidimensional scales were satisfactory. There were no cultural, bicultural, and bilingual differences in general or creativity self-efficacy between German and Chinese participants. The study showed significant differences in cultural efficacy among Caucasian-German, Asian-German, Chinese studying abroad and domestic Chinese. The relationships among general self-efficacy, creativity self-efficacy and cultural efficacy were also discussed.

Key words

cultural difference, general self-efficacy, creativity self-efficacy, cultural efficacy

The present article firstly introduces the theoretical aspects of general self-efficacy, creativity self-efficacy and cultural efficacy and some empirical researches of cross-cultural comparisons, and then describes the development and the psychometric properties of two scales which were designed to measure creativity self-efficacy and cultural efficacy. This paper finally compares the characteristics of German and Chinese participants on the three kinds of efficacy. The purpose of the present study is twofold: to plan reliable and valid scales of creativity self-efficacy and cultural efficacy, and to compare the cultural and bicultural differences between German and Chinese participants.

Introduction

General self-efficacy

Self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). The construct of self-efficacy is a core theoretical point of Bandura's social-cognitive theory (Bandura, 1977, 1997, 2001). Some researchers suggest that a high level self-efficacy is related to better mental, physical health and easier social adaption (Schwarzer, 1992; Bandura, 1997). General self-efficacy (GSE) aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Schwarzer, 1992; Schwarzer, 1999).

The General Self-Efficacy scale, developed to measure this construct at the broadest level, has been adapted to many languages (Scholz et al., 2002; Luszczynska et al., 2005). The psychometric properties of this instrument were examined among 19,120 participants from 25 countries. The previous findings confirmed that the measure is configurally equivalent across cultures, that is, it corresponds to only one dimension. The results also pointed to a number of cross-cultural differences, specifically, Japanese and Hong Kong Chinese displayed the lowest levels of GSE. The Chinese females were found significantly lower in GSE than males. The

authors supposed that self-efficacy may be rated lower in collectivistic cultures than individualistic cultures. The Chinese were regarded as less individualistic than Westerners, so the researchers thought that it would be interesting to compare their scores in future studies with corresponding levels of collective self-efficacy (Bandura, 1995; Schwarzer et al., 1997).

Klassen (2004) reviewed critically much of the research investigating self-efficacy beliefs through cross-cultural comparison. Two sets of cross-cultural comparison groups were examined: Asian (or immigrant Asian) versus Western, and Easten European versus Western European and American groups. Almost all of the 20 studies reviewed found efficacy beliefs to be lower for non-Western cultural groups, but in some cases these lower beliefs were more predictive of subsequent functioning. There is some evidence that the mean efficacy beliefs of a cultural group are modified through immigration or political changes. For some non-Western groups, collective efficacy appears to operate in much the same way as self-efficacy operates for Western groups. Realistics - as opposed to optimistic - efficacy beliefs do not necessarily predict poor performance for all cultural groups, as has been suggested by self-efficacy theory. Only a minority of researches included measurement of cultural dimensions such as individualism and collectivism, although most of the researches based conclusions on assumed cultural differences. In some cases, self-efficacy was poorly defined and bore little resemblance to theoretically derived definitions. Conclusions from this study have implications especially for applied settings in education and business: Efficacy beliefs and performance appear to be enhanced when training approaches are congruent with the individual's sense of self. Lower levels of self-efficacy beliefs found in some collectivist groups do not always signify lower subsequent performance, but are instead reflective of a differing construction of self.

Creativity self-efficacy

Obviously, general self-efficacy is domain-general and refers to a global confidence in one's generalized sense of self-efficacy. However, self-efficacy is commonly understood as domain-specific; that means, one can have more or less firm self-beliefs in different domains or particular situations of functioning. Creativity self-efficacy has been defined as "the belief one has the ability to produce creative outcomes" (Tierney & Farmer, 2002, p. 1138). A three-item scale was developed to assess creativity self-efficacy of workers (manufacturing, $\alpha = .83$; operations, $\alpha = .87$). They used data from two different firms and tested a new construct, creativity self-efficacy, tapping employees' beliefs that they can be creative in their work roles. It was also found that creativity self-efficacy predicted creative performance beyond the predictive effects of job self-efficacy.

Beghetto (2006) examined correlations of creative self-efficacy in middle and secondary students (N = 1, 322). Results demonstrated that students' mastery - and performance - approach beliefs and teacher feedback on creative ability were positively related to students' creative self-efficacy. Creative self-efficacy was also linked to student reports of their teachers not listening to them and sometimes feeling that their teachers had given up on them. Students with higher levels of creativity self-efficacy were significantly more likely to indicate that they planned to attend college than students with lower levels of creativity self-efficacy. Finally, students with higher creativity self-efficacy were significantly more likely to report higher levels of participation in after-school academics and after-school activities. Three items were used to assess creativity self-efficacy ($\alpha = .86$). Specially, items in this study were intended to measure students' beliefs about their ability to generate novel and useful ideas and whether they viewed themselves as having a good imagination. The three items were (a) "I am good at coming up with new ideas," (b) "I have a lot of good ideas, " and (c) "I have a good imagination."

However, both of the measures were based on the American participants, as yet, there is no researcher examining the cross-language equivalence to verify whether the theoretical construct of Creativity Self-Efficacy is universal. At the same time, planning the measures was not the core objective in both of the studies, so more precise and strict planning of the creativity self-efficacy seems to be needed. In the present study we define creativity self-efficacy as perceived beliefs about the capability to produce novel and appropriate ideas, works, or productions.

Cultural efficacy

People do not live their lives in social isolation. They frequently need a collective effort in the face of difficulties and challenges. Bandura (1986, 1997) defined a group-level self-efficacy belief - collective efficacy - as "shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477) and he supposed that the collective efficacy is rooted in self-efficacy, so that research on personal efficacy does not necessarily reflect an individualistic bias in psychology. Bandura (1986) thought that the strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort. So we can say that there are different levels of collective efficacy. Previous studies have investigated the collective of classroom, school, work department, sport team, and cultural group etc (Bandura, 1997).

The researchers have found disparities in the ways in which collective or group efficacy operate across cultures (Klassen, 2004). For example, for collectivists, group or collective beliefs also appear to be key motivational components that foster achievement. Earley (1993) found that managers who came from generally collectivist cultures appeared to express the highest levels of efficacy beliefs (and performance) when they believed they were working with an in-group.

Conversely, managers from a predominantly individualist cultural background performed best,

and expressed the highest self-efficacy beliefs, when they believed they were working alone.

Earley´s study (1994) also indicated that group-level training was most effective for improving

expectations, effort, and performance in managers with a collectivist orientation whereas

managers from an individualist cultural orientation benefited primarily from individual-level

instruction.

One of the core variables in the present article is the collective efficacy of culture -

cultural efficacy, which is defined as perceived beliefs about the capability of the people in some

kind of culture to achieve goals and manage the environment. At first, the concept is a kind of

collective efficacy, which is opposite to self-efficacy, and the level of it is national, or smaller,

such as a sub-cultural group, or bigger, such as a region where people share the same language.

Second, the beliefs cannot only about one's own culture, but also about other cultures.

Bernal and Froman (1987) developed the Cultural Self-Efficacy Scale (CSES) to assess

the perceived sense of self-efficacy among community health nurses caring for culturally diverse

clients. The nurses who completed the CSES were found to be neutral to low self-efficacy when

caring for three ethnic groups (African-Americans, Puerto Ricans, and Southeast Asians). In a

second study, Bernal and Froman (1993) found that greater knowledge of transcultural nursing

through formal and informal coursework increased the nurses' perceptions of confidence in

caring for culturally diverse clients. Their findings also support the view that interactions with

diverse clients within undergraduate and work experiences increases cultural self-efficacy.

St.Clair and McKenry (1999) demonstrated that students who experienced international clinical

experiences had higher cultural self-efficacy than those who had not. Similarly, another study

demonstrated increased cultural self-efficacy scores among students participating in learning

experiences with minority populations (Williamson, Stecchi, Allen, & Coppens, 1996). In an

integrated review of the cultural self-efficacy literature, derived from the analysis of 26 published studies using the CSES spanning all regions of the U.S., nurses reported low to neutral sense of self-confidence, while students in the U.S. report slightly higher mean levels than their respective practicing nurses (Coffman et al., 2004). Lowest perceptions of confidence in providing care were consistently found with Southeast Asians, followed by Hispanics and African-Americans. Findings do indicate, however, that coursework and educational experiences can increase students' levels of self-efficacy in delivering culturally competent care. No published or unpublished works were found that addressed levels of confidence in caring for elders.

However, this kind of cultural self-efficacy was more about the work of eldercare or nursing, and the items of the scale were more about the eldercaring or nursing techniques (Shellman, 2006). So actually this kind of scales are working self-efficacy or working attitude of people coming from different cultures. Furthermore, in the measurement of collective efficacy, we think that self and culture are two different conceptions, so we use the conception of cultural efficacy.

Research question

The present article aims at examining the psychometric properties of the Creativity Self-Efficacy and Cultural Efficacy Scale and at comparing the cultural, bicultural differences between German and Chinese participants. Specifically, due to the reviews mentioned above, we suppose that people in an individualistic culture such as German would have higher general and creativity self-efficacy and lower cultural efficacy than those in collectivistic culture such as Chinese. It is also supposed that, the more individualistic the cultural experience, the higher the general and creativity self-efficacy and the lower the cultural efficacy.

Therefore, we have 11 hypotheses:

Hypothesis 1. The scales of creativity self-efficacy and cultural efficacy would have an acceptable construct, reliability and validity for the use of cross-cultural comparison.

Hypothesis 2. The general and creativity self-efficacy of German participants would be higher than those of the Chinese counterparts.

Hypothesis 3. The cultural efficacy of Chinese participants would be higher than that of the German counterparts.

Hypothesis 4. In German participants, the general and creativity self-efficacy of German participants would be higher than those of Asian-Germans.

Hypothesis 5. In German participants, the cultural efficacy of Asian-Germans would be higher than that of the German.

Hypothesis 6. In Chinese participants, the general and creativity self-efficacy of Chinese studying abroad would be higher than those of domestic Chinese.

Hypothesis 7. In Chinese participants, the cultural efficacy of domestic Chinese would be higher than those of Chinese studying abroad.

Hypothesis 8. The cultual efficacy (of German, of Chinese, and of American culture) of Chinese participants would be higher than that of the Germans.

Hypothesis 9. In German participants, the cultural efficacy (of German, of Chinese, and of American culture) of Asian-Germans would be higher than that of Germans.

Hypothesis 10. In Chinese participants, the cultural efficacy (of German, of Chinese, and of American culture) of domestic Chinese would be higher than those of studying Chinese abroad.

Hypothesis 11. There would be significant correlations among general self-efficacy, creativity self-efficacy and cultural efficacy, furthermore, cultural efficacy would moderate the effect of general self-efficacy on creativity self-efficacy.

Method

Participants

To develop the two new scales and to conduct the psychometric evaluation of them, 90 teachers (28 males, 62 females) and 435 students (188 males, 247 females) of middle schools in China were recruited. The mean age for the teachers and the students was 28.33 (SD = 5.56) and 14.93 (SD = 2.31), respectively. They were recruited on a voluntary basis, and forms were completed during class periods.

The participants for cultural comparisons included 45 German students (FRG citizens) from Free University of Berlin and other German Universities, and 61 Chinese students (PRC citizens) from Chinese and German universities. German participants were recruited through advertisements placed in dining halls or on websites for student affairs (www.StudieVZ.de). There were 29 German Students and 16 Asian-German Students. All of whom had no study experience abroad. Chinese participants were recruited also through advertisements placed in dining halls. As to the Chinese participants, 31 students studying abroad were from Free University of Berlin, Humboldt University of Berlin. All of them had previously studied in one of the Chinese universities and now study in one of the German Universities. The other 30 domestic Chinese students were from Tsinghua University Bejing, Tongji Univerity Shanghai. At this point, they also had no experience to study abroad, like their German counterparts.

The German participants consisted of 26 women and 19 men. Caucasian-German consisted of 17 women and 12 men, and Asian-German consisted of 9 women and 7 men. The Chinese participants included 30 men and 31 women. Chinese studying abroad included 8 men and 23 women and domestic Chinese included 22 men and 8 women.

The mean age of the German participants was 24.25 years (age range from 19 to 36 years of age, *SD* = 3.48) and for the Chinese it was 24.52 years (age range from 20 to 42 years of age,

SD = 3.88). The mean age of Caucasian-German participants was 24.96 years (age range from 19

to 36 years of age, SD = 3.86) and for the Asian-German it was 23.14 years (age range from 20 to

29 years of age, SD = 2.51). The mean age of Chinese studying abroad participants was 26.64

years (age range from 22 to 42 years of age, SD = 4.15) and for the domestic Chinese it was

22.53 years (age range from 20 to 29 years of age, SD = 2.24).

The ethnic background of the German students was as mentioned above: 29 Caucasian-

Germans and 16 Asian-Germans. In the Asian-Germans, there were 1 Vietnamese-German, 2

Hong Kong -Chinese-Germans, and 13 Mainland-Chinese- Germans. Most of them (N = 14,

87.5%) fluently spoke Asian mother language of their parents at home. 12 of them were 2nd

generation German and 4 of them were 3rd generation German.

All Chinese participants were Chinese natives. Chinese studying abroad have been in

Germany from 2.5 months to 66 months (mean = 19.3 months). 18 of them spoke fluent German.

7 of them had learned German for one semester in China before they came to Germany, and 6 of

them had learned German for two months in China before they came to Germany.

The first author, a male native-Chinese student, conducted both the German and Chinese

parts of the sampling.

Measures

General self-efficacy (GSE). The GSE Scale (Schwarzer & Jerusalem, 1995) was used to

assess perceived beliefs about the ability to achieve goals and manage the environment (e.g.,

"When I am confronted with a problem, I can find several solutions") (see Appendix). It consists

of 10 items on a 4-point Liket-type scale ranging from "not at all true" to "exactly true". The

Chinese version has been translated and validated by Zhang and Schwarzer (1995). The GSE

scale has been used in numerous research projects where it typically yielded internal

consistencies between alpha = .75 and .91. The psychometric properties of this instrument were

examined among 19,120 participants from 25 countries and the results suggested that it is a

unidimensional and universal construct (Scholz et al., 2002).

Based on the GSE Scale, the other two measures, Cultural Efficacy and Creativity Self-

Efficacy Scales were planned to be developed in this study. The Cultural Efficacy Scale was

developed to assess perceived beliefs about the ability of the people in some kind of culture to

achieve goals and manage the environment (e.g., "The people in this country have the

resourcefulness to handle unforeseen situations.") (see Appendix). The collective layer of cultural

globe of CPMC – the Cultural Pyramid Model of Creativity – and the definition of efficacy were

concerned during the development of the first version of the instrument. Creativity Self-Efficacy

Scale was used to assess perceived beliefs about the ability to produce novel and appropriate

ideas, works, or productions (e.g., "I am certain that I can produce novel and appropriate ideas.")

(see Appendix). Due to the definition of creativity and self-efficacy, the items of the first version

of Creativity Self-Efficacy were developed. At the beginning of development, just like the GSE

Scale, both of the two new instruments consist of 10 items on a 4-point Liket-type scale ranging

from "not at all true" to "exactly true".

Results

Modification of the first edition of the two new scales

For the modification of the first edition, the 110 teachers mentioned above were recruited.

The items were analyzed by the quantitative standards (DeVellis, 2003). Item-to-total and item-

to-item correlations were examined to assess relationships of each variable to the overall scale

and multicollinearity. Three items of the Cultural Efficacy Scale were deleted due to correlations

below the .30 level in the item-to-total correlations. No item-to-item correlations were found to

be greater than 0.70, therefore, no items were deleted due to item-to-item multicollinearity. For

the Creativity Self-Efficacy Scale, four items were deleted due to correlations below the .30 level

in the item-to-total correlations. There were no items deleted due to item-to-item

multicollinearity.

Principal components factor analysis was used to analyze the conceptual structure of the

scale. To determine the number of factors two criteria were used to rotate, the screen test and the

interpretability of the factor solution. One factor was rotated in each scale. In the Cultural

Efficacy Scale the one factor can interpret 64.06% of the variance of Extraction Sums of Squared

Loadings, and in the Creativity Self-Efficacy Scale the interpretability was 59.70%. One item in

each scale was deleted due to the low extraction loading and instability of factor component.

Reliability analyses showed that the Cronbach's alpha were .89 for the 6 items of the

formal vision of the Cultural Efficacy Scale and .83 for the 5 items of the formal vision of the

Creativity Self-Efficacy Scale. The internal consistency of the whole scale was also very good.

The item-to-item correlations were from .39 to .68 for the 6 items of the formal vision of the

Cultural Efficacy Scale and from .41 to .55 for the 5 items of the formal vision of the Creativity

Self-Efficacy Scale, which suggested that participants have an acceptable internal relevancy

about the cultural efficacy and creativity self-efficacy.

Revision of the final edition of the two new scales

We conducted a confirmatory factor analysis (CFA) with Mplus 4.0 to examine the factor

structure of the formal scales. 562 students as mentioned above, were recruited. To examine the

concurrent validity of two new scales, the data of GSE Scale were analyzed together with the

other two scales. All testing of measurement models and structural models in this study was

based on ANCOVA structures. The Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and

the root mean square error of approximation (RMSEA) were presented here. Generally, values of

CFI and TLI greater than .90 and RMSEA less than .07 indicate adequate fit (Byrne, 1994).

The CFA results confirmed a single-factor model for both of the scales. For the Cultural

Efficacy Scale, $\chi^2(9) = 16.53$, CFI = .97, TLI = .96, RMSEA = .04, and for the Creativity Self-Efficacy Scale, $\chi^2(5) = 12.54$, CFI = .98, TLI = .96, RMSEA = .06. The standardized estimates of factor loading for the constrained model ranged from .35 to .65 for the Cultural Efficacy Scale, and from .50 to .62 for the Creativity Self-Efficacy Scale, respectively.

The concurrent validity of Cultural Efficacy Scale was .57, $p < .01$, and of Creativity Self-Efficacy Scale was .80, $p < .01$, which demonstrated that there were positive significant correlations not only between cultural efficacy and general self-efficacy but also between creativity self-efficacy and general self-efficacy.

The results of reliability and the validity testing of the two scales presented above indicated that both of the two scales have single-factor. The instruments had sufficient internal consistency reliability and validity for the use as independent measures of cultural efficacy and creativity self-efficacy. So the hypothesis 1 is partly confirmed.

Cultural comparison of general self-efficacy, creativity self-efficacy and cultural efficacy

Descriptive statistics including means of the measures are showed in Table 1. Table 2 presents the Peason correlation coefficients between these variables in four groups of cultural experiences. First, ANOVA was conducted to test gender and cultural differences in general self-efficacy, creativity self-efficacy and cultural efficacy of own culture. No significant Gender $\times$ Culture interaction, gender and culture differences were found. So there was no significant difference in the three mentioned variables between German and Chinese.

Second, ANOVA was conducted to test gender and cultural experience differences in general self-efficacy, creativity self-efficacy and cultural efficacy of own culture. There was no significant Gender $\times$ Cultural Experience interaction, gender and cultural experience difference. So there was no significant difference in the three mentioned variables between the four groups of cultural experiences.

So the hypothesis 2 to 7 is not confirmed.

Table 1

Means of General, Cultural, and Creativity self-efficacy in German and Chinese

		German					Chinese					
		Caucasian-German		Asian-German		country mean	studying abroad		domestic Chinese		country mean	total mean
scale	items	m	f	m	f		m	f	m	f		
General self-efficacy	10	2.81	2.87	3.08	2.50	2.83	2.70	2.73	2.75	2.63	2.72	2.77
Cultural efficacy of own culture	6	2.83	2.53	2.72	2.47	2.65	3.33	2.84	3.27	3.22	3.04	2.89
Creativity self-efficacy	5	2.82	2.82	2.97	2.36	2.78	2.70	2.76	2.75	2.60	2.74	2.75

Table 2

Intercorrelations between measures in the four groups of cultural experiences

	CEC	CEG	CEA	CSE
Caucasian-German				
CEC	—			
CEG	.37	—		
CEA	.27	.45*	—	
CSE	.35	.29	.15	—
GSE	.22	.17	.11	.74***
Asian-German				
CEC	—			
CEG	.31	—		
CEA	.65*	.35	—	
CSE	.20	.37	.27	—
GSE	.17	.56	.20	.84***
studying abroad Chinese				
CEC	—			
CEG	.34	—		
CEA	.41*	.77***	—	
CSE	.26	.00	.23	—
GSE	.32	-.14	.12	.74***
domestic Chinese				
CEC	—			
CEG	.80**	—		
CEA	.77**	.86***	—	
CSE	.17	.13	-.12	—
GSE	.19	.08	-.29	.68***

Note. CEC = Cultural efficacy of Chinese culture; CEG = Cultural efficacy of German culture; CEA = Cultural efficacy of American culture; CSE = Creativity self-efficacy; GSE = General self-efficacy.
* $p < .05$; ** $p < .01$, *** $p < .001$ (two-tailed). The following is the same as well.

Third, a 2 (culture) $\times$ 2 (gender) MANOVA was conducted with cultural efficacy (of German culture, of Chinese, and of American culture) as dependent variables. In multivariate tests, using the Wilk's criterion, the Gender $\times$ Culture interaction was not significant, Wilk's Lambda = .95, $F(3, 71) = 1.16$, $p > .05$. The main effect for gender was not significant, Wilk's

Lambda = .91, F (3, 71) = 2.27, p > .05, The main effect for culture was significant, Wilk's

Lambda = .78, F(3, 71) = 6.87, p < .001. For the Chinese participants, the means of the cultural

efficacy of German culture, of Chinese, and of American culture were 3.06, 3.04, and 3.14,

respectively. And for the German counterparts, the means were significantly lower than Chinese,

they were 2.65, 2.72 and 2.64 (table 3). So the hypothesis 8 is partly confirmed (see table 2, 3 and

4).

Fourth, a 4 (culture experience) $\times$ 2 (gender) MANOVA was conducted with cultural

efficacy (of German, of Chinese, and of American culture) as dependent variables. In

multivariate tests, using the Wilk's criterion, the Gender $\times$ Cultural experience interaction was

not significant, Wilk's Lambda = .87, F (3, 71) = 1.05, p > .05. The main effect for gender was

not significant, Wilk's Lambda = .95, F (3, 71) = 1.29, p > .05, The main effect for cultural

experience was significant, Wilk's Lambda = .71, F(3, 71) = 2.78, p < .01. For the domestic

Chinese participants, the means of the cultural efficacy of German, of Chinese, and of American

culture were 3.36, 3.15, and 3.28, respectively. For the Chinese counterparts studying abroad, the

means were 2.96, 2.92 and 3.11, respectively. For the Asian-German counterparts, the means

were 2.69, 2.82 and 2.86, respectively. And for the German counterparts, the means were 2.66,

2.68 and 2.58, respectively (table 3). As we can see more concretely from the table 4, on the

dimension of cultural efficacy of German culture, domestic Chinese gained significantly higher

scores than the other three groups. And Chinese studying abroad showed significantly higher

cultural efficacy than Caucasian-Germans. On the dimension of cultural efficacy of Chinese

culture, domestic Chinese gained significant higher scores than Caucasian-German. Furthermore,

on the dimension of cultural efficacy of American culture, domestic and Chinese studying abroad

gained significantly higher scores than Caucasian-Germans and Asian-Germans. So the

hypothesis 9 and10 are partly confirmed (see table 2, 3 and 4).

Table 3

Means of cultural efficacy of German, Chinese and American cultures in German and Chinese

scale	items	German					Chinese					total mean
		Caucasian-German		Asian-German		country mean	studying abroad		domestic Chinese		country mean	
		m	f	m	f		m	f	m	f		
Cultural efficacy of German culture	6	2.83	2.53	2.72	2.47	2.65	2.97	2.90	3.35	3.50	3.06	2.87
Cultural efficacy of Chinese culture	6	2.68	2.73	2.89	2.57	2.72	3.33	2.84	3.27	3.22	3.04	2.89
Cultural efficacy of American culture	6	2.45	2.73	2.86	2.57	2.64	3.19	3.03	3.25	3.44	3.14	2.91

Table 4

Post hoc comparison of four groups of cultural efficacy

Mean Difference	Caucasian-German	Asian-German	Chinese studying abroad
Cultural efficacy —German culture Caucasian-German	—		
Asian-German	.03	—	
Chinese studying abroad	.30*	.27	—
domestic Chinese	.70***	.67**	.40*
Cultural efficacy —Chinese culture Caucasian-German	—		
Asian-German	.14	—	
Chinese studying abroad	.28	.14	—
domestic Chinese	.47*	.33	.19
Cultural efficacy —American culture Caucasian-German	—		
Asian-German	.17	—	
Chinese studying abroad	.54**	.36*	—
domestic Chinese	.70***	.53*	.16

Note. All of the values were absolute values (LSD).

Examining the relationships between general self-efficacy, creativity self-efficacy and cultural efficacy

The correlation coefficients of three variables are in Table 5. They have significant correlations. Path analysis was used to examine the relationships among general, cultural, and

creativity self-efficacy. The path coefficient from general self-efficacy to cultural efficacy of own culture is .23 ($p < .05$). The path coefficient from cultural efficacy of own culture to creativity self-efficacy is .10 n.s and the coefficient from general self-efficacy to creativity self-efficacy is .71 ($p < .001$). So the results suggest that cultural efficacy is a mediator of general self-efficacy and creativity self-efficacy. (Sobel test of indirect effect, $p < .05$; see Figure 1). In path analysis, it was found that the direct effect of general self-efficacy on cultural efficacy was .23, and the direct and indirect effect of general self-efficacy on creativity self-efficacy was .71 and .02, moreover, the direct effect of cultural efficacy on creativity self-efficacy was .10. In general, about 55.1% variance of creativity self-efficacy can be explained by the other two variables, $F (2, 103) = 54.53$, $p < .001$. General self-efficacy can explain 5.4% variance of cultural efficacy, $F (2, 103) = 5.28$, $p < .05$. So the hypothesis 11 is partly confirmed (see Table 6).

Table 5

Correlations between general self-efficacy, creativity self-efficacy and cultural efficacy

variables	GSE	CSE	CEO
GSE	—		
CSE	.72**	—	
CEO	.23*	.23*	—

Note. CEO = Cultural Efficacy of Own culture. The following is the same as well.

Table 6

The effects of the variables in path analysis

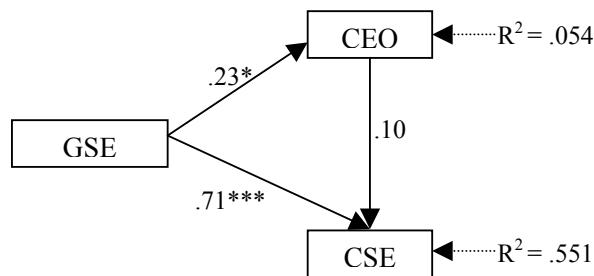| Independent variable		CEO	CSE
GSE	direct effect	.23	.71
	indirect effect		.02
	total effect	.23	.73
CEO	direct effect		.10

Figure 1. *Path analysis of the three variables*

Discussion

Our study focused on the development of two new scales and a cultural comparison of the application of these scales with German and Chinese probands. In order to examine how the bicultural or the bilingual experiences influence people's general self-efficacy, creativity self-efficacy and cultural efficacy, we also recruited Asian-German and Chinese studying abroad as the participants.

Rating the psychometric properties of the two new scales

With the first two steps of samplings, it was found that the psychometric properties of the two new scales, the Creativity Self-Efficacy Scale and Cultural Efficacy Scale were satisfactory.

Reliability, item-total correlations, and factor loadings suggested that both of the scales can be seen as homogeneous and unidimensional. So the hypothesis 1 was partly confirmed.

Self-efficacy is commonly understood as domain-specific and creativity self-efficacy is some kind of the self-belief one has in the "domain" of creativity. The results in present study are that creativity self-efficacy seems to support the findings of Tierney and Farmer (2002). They have developed the scale with the same name and they subsequently reduced the item pool three times from 46, 13, to 3, respectively. With the EQS they also found the single-factor model has the best fit results. But the change of the item pool was so big that it was probably hard to obtain the proper items. However, their scale was especially for the worker in firms (manufacturing or operations). The situation can be different from the scale in present research, which is for the general people. Moreover, the findings in present study also seem to support the hypothesis in Beghetto's study (2006) that Creativity Self-Efficacy Scale can be seen as homogeneous and unidimensional. But there was no more analysis of factor loadings, validity etc. in that study.

Cultural efficacy was also found as homogeneous and unidimensional. It can be understood as one kind of collective efficacy which was defined and discussed by Bandura (1986, 1997). He did not talk about the dimensions of the collective efficacy but he thought that from different sources such as groups, organizations, or nations people can partly get the sense of collective efficacy, conquer difficulties and improve their living standard through concerted effort. The cultural efficacy in present study is one kind of collective efficacy of the national or much bigger level. When we use it to assess people's perceived beliefs about the capability of the people in their own culture to achieve goals and manage the environment, the efficacy then is self perception through one's own culture. When we use it to assess people's perceived beliefs about the capability of the people in the other cultures, the efficacy then references to stereotypes, attitudes or impressions of other cultures. Some scales like Cultural Self-Efficacy Scale (Bernal

& Froman, 1987), or Eldercare Cultural Self-Efficacy Scale (Shellman, 2006) were also developed, however, they were more about nursing or eldercaring, so they are different from the scale in the present study.

Can culture, bicultural, bilingualism, or gender influence people's general and creativity self-efficacy?

As the results demonstrated, there was no cultural, bicultural, and bilingual difference in general and creativity self-efficacy between Caucasian-Germans, Asian-Germans, Chinese studying abroad and domestic Chinese or between German and Chinese participants. Surprisingly, the finding does not seem to support claims in many other studies (e.g., Schwarzer et al., 1997; Scholz et al., 2002) that Chinese perceived lower general self-efficacy than their German counterparts and self-efficacy might be rated lower in collectivistic cultures than individualistic ones. Of course, the Chinese data base in both studies cited above was from Hong Kong. Hong Kong Chinese were probably not representative for Chinese students or even for the Chinese population (Schwarzer et al., 1997). In Klassen's review (2004), the efficacy beliefs of Asians, immigrant Asian groups, and Western groups (i.e. Western European, European American, or Canadian) were compared. Actually, in the 16 studies cited in this part of the review there were only 3 taking samples from mainland China (People's Republic of China), while the other "Chinese" samples were Hong Kong Chinese or Taiwan Chinese, which were somewhat different from mainland Chinese. Although they are different, their common sharing aspects are in all probability higher than their differences.

Mau (2000) examined the relations between decision-making self-efficacy and decision-making styles (rational, dependent, and intuitive) of Taiwanese and American (largely Caucasian) college students, attributed the lower efficacy beliefs of the Taiwanese students to "the collective-oriented culture (that) may have influenced Taiwanese students to rely less on individual abilities

than on group efforts" (p. 374). Mau's study found that although a majority of American and Taiwanese students endorsed a rational style of decision-making (e.g., "I am very systematic when I go about making an important decision"), the Taiwanese chose a dependent style ("When I make a decision it is important to me what my friends think about it") as the second most likely choice, while the Americans were significantly less likely to endorse a dependent style. Although self-efficacy is not the standard to distinguish individualistic from collectivistic, Mau (2000) suggested that it is the cultural dimensions of individualism and collectivism that differentially influence the development of self-efficacy belief: "The culture that is individual-oriented is more conductive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy".

We can also suppose that most of the Hong Kong and Taiwan Chinese previously had more western influence than mainland Chinese. They may be more individualistic and could have a higher level of self-efficacy than mainland Chinese. But the results suggested that this is not the reality. According to the results in present and previous studies, the general self-efficacy of Hong Kong or Taiwan Chinese could be even lower than that of mainland Chinese. Is it possible that individualistic and collectivistic as the two opposite characteristics coexist in one person? Probably the situations that influence people's self-efficacy in Hong Kong, Taiwan and mainland China have changed in the last 10 years. Nisbett (2003) has cited some studies in his book. One of the studies found that the socialization of Chinese children was becoming more and more western. The researchers compared the expectations of mothers in Beijing of their children between the 1980s and ten years later. They found that in the 1980s mothers were more concerned about the ability to deal with diversified relations. And ten years later their biggest concern was almost like western mothers, whether their children had the survival ability and independence. Nisbett and his colleagues used a value ideas questionnaire to compare the value

ideas between the students of Peking University and the students of Michigan University. They found that the students of Peking University think more about equality, imagination, independence, open mind and diversity of life than the counterparts from Michigan. However, the students of Michigan University think more about self-discipline, loyalty, even homage to tradition and respect to parents and father figures.

The creativity self-efficacy showed high correlation with general self-efficacy and there is also no difference between Germans and Chinese. There were no relative studies that could be found and compared with the finding in present study. It was supposed that creativity self-efficacy as one domain-specific level of self-efficacy was also rooted in general self-efficacy. From the feedback of daily experience and a general sense of self competence man can probably get the specific self-beliefs about his own capability to produce novel and appropriate ideas, works, or productions.

Previous research (Schwarzer, 1993; Schwarzer et al., 1997) found that in one of the samples of German university students, men had higher self-efficacy than women, and the Chinese females had significantly lower general self-efficacy than males. However, in present study, there was no gender difference. Just as Schwarzer (1993) said that in most of the previous German samples under study there were no gender differences. And it is important to examine whether the construct of general self-efficacy favours men, or if there is a "male bias" in the scale, and why gender differences can be found in some studies and in others not.

Can culture, biculture, bilingualism or gender influence people's cultural efficacy?

The study showed significant differences in cultural efficacy among Caucasian-Germans, Asian-Germans, Chinese studying abroad and domestic Chinese. Cultural efficacy is supposed in present study as a kind of collective efficacy. So the findings seem to partly support the hypotheses or conclusions of other researchers (e.g. Schwarzer et al., 1997; Earley, 1993, 1994)

that Chinese are regarded as less individualistic and more collectivistic than Westerners, so they

could have lower general self-efficacy and higher cultural efficacy than the western counterparts.

Actually, not only on the dimension of cultural efficacy of own culture, but also on the dimension

of cultural efficacy of German or American culture, Chinese in present study showed

significantly higher scores than their German counterparts. So there are obviously cultural

differences in cultural efficacy. Moreover, are there bicultural or bilingual differences?

Most of the Asian-Germans in present study speak at home the mother language of their

parents or their grandparents while at the same time German is their mother language. So they are

the only "pure" bilingual sample in the four groups. Chinese studying abroad have two cultural

experiences, although the mean of the German cultural experience is only 20 months, so they are

the bicultural sample of the four groups. From the results we can find that only on the dimension

of cultural efficacy of German and American culture, the Asian-Germans showed lower scores

than domestic Chinese and Chinese studying abroad, respectively. So the results suggested that

there were weak bilingual differences found in present study. As to the Chinese studying abroad,

only on the dimension of cultural efficacy of German culture they had lower scores than domestic

Chinese. So there was probably a weak bicultural difference that was found in this study. Again,

there was no gender difference found in present study.

Bandura (1995) stated that it would be interesting to compare the cross-cultural scores in

future studies with corresponding levels of collective self-efficacy. We find in present study some

results are really interesting. As we have seen in present study, Chinese participants showed

significant higher cultural efficacy not only on the dimension of cultural efficacy of their own

culture, but also on the dimensions of cultural efficacy of German or American culture. Mau

(2000) suggested that it is the cultural dimensions of individualism and collectivism that

differentially influence the development of self-efficacy beliefs: "The culture that is individual-

oriented is more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy". Even in her explanation we can feel the low self-efficacy of own collective-oriented culture. The finding in present study doesn't seem to support this kind of claim. Maybe we can change it as to the culture that is individual-oriented that may have inhibited the development of cultural efficacy, while the collective-oriented culture is more conducive to fostering cultural efficacy. This perspective probably can explain the results in present study.

The other difference is also interesting. As for the German participants, they have the highest cultural efficacy about Chinese culture and the lowest cultural efficacy about American culture. And for the Chinese participants, they have the highest cultural efficacy about American culture and the lowest cultural efficacy about German culture. Both of the two groups of participants have the medium level cultural efficacy about their own culture. Obviously, Chinese participants have better beliefs about American culture than about German or own culture and German participants seem to believe that Chinese culture is more perfect than American and own culture.

Now as to the relations among general self-efficacy, creativity self-efficacy and cultural efficacy

The study demonstrated that there were significant correlations among the three core variables, general self-efficacy, creativity self-efficacy and cultural efficacy. The path analysis showed that both of the creativity self-efficacy and cultural efficacy were rooted in general self-efficacy, which supports the thought of Bandura (1986). And there was no direct effect from cultural efficacy to creativity self-efficacy, which means probably the collective efficacy is not the resource of domain-specific self-efficacy, especially not the resource of creativity self-efficacy. The deduction could be made that the influence of high general self-efficacy on creativity self-efficacy is bigger than the influence on cultural efficacy. Furthermore, when

people have the same level of general self-efficacy, the creativity self-efficacy could not be advanced through the promotion of collective efficacy.

Based on the claims of Mau (2000) in her study and the findings in present study, probably we can probably coordinate the relationships between self (collective)-efficacy and individualistic - collectivistic as following. On the one hand, the culture that is individual-oriented is more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy. On the other hand, the culture that is individual-oriented may have inhibited the development of cultural efficacy, while the collective-oriented culture is more conducive to fostering cultural efficacy. From Hofstede (1980) till now, there are extensive studies supporting the claim that Chinese are more collectivistic than Germans and Germans are more individualistic than Chinese.

From this view, how can we explain the whole result in the present study? For the Chinese side, from 1978 the policy of reform and opening up is enforced in the whole country. During this time, industrialization and market economy become the main requirment. At the same time, western culture invade China like floodwater during the last 30 years. This process happens widely and relates to the selection of political, economic, cultural and educational system, life style and value ideas etc. A typical event of this process was China becoming a member of WTO in 1999. Most of the young people like the participants in present study think that western civilization and development level is one of the best futures of China. So we can suppose that the Chinese are becoming more and more individualistic. If we compare the results in present study with the other study related to the same topic, we can see the process of changing. Especially, most of the Chinese participants in this study are students from Chinese top-class universities or students studying abroad. They have relatively more influences from western culture. On the contrary, in the process of modernization, how to maintain traditional culture is still a big

challenge to all Chinese. People cannot live in a vacuum, and they also have no way to select the

value ideas totally at their pleasure. Actually, traditional culture like Confucianism, Taoism, still

has a popular impact and is probably still the basic belief in China. So they keep the collectivistic

characteristics. In one word, Chinese today probably have a very inconsistent belief pattern. We

are especially concerned about the Chinese participants in the present study that showed the

highest cultural efficacy about American culture.

For the German side, from Hofstede (1980) till now, there are many studies (e.g. Nisbett,

2003) finding that the German culture is not a typical individualistic culture, but is also not as

collectivistic as the Chinese culture. If we say "western culture", we should notice that there are

also different characteristics in the western world. Of course, comparing with Chinese culture,

western culture seems to have a few similar aspects. In the development and industrialization of

German society, Germans probably have seen more problems and puzzles of American culture.

At the same time, Germans can get little concrete and timely information about Chinese culture.

So they probably have better opinion about Chinese culture than about American.

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Chapter 4

Creative organizational climate of school and creativity development of children

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Abstract

The major objectives were: (a) development of the Beijing Test of Creative Thinking (BTCT), which was designed to measure verbal and figural creativity; (b) analyses of the characteristics of the creativity development of Chinese children, the creative organizational climate of school, and the relations between them. The results demonstrated that the psychometric properties of the BTCT were satisfactory. The BTCT consisted of two subtests – Verbal subtest and Figural subtest - and each subtest has one item. Regarding the developmental trend of creativity scores of children, it was found that the creativity scores of children in elementary school were significant higher than those of children in secondary school. For the children, the scores of the creative organizational climate of the elementary school were significantly higher than those of the secondary school. When the two variables were analyzed together, both the creative organizational climate of school and the creative thinking development of children were decreasing during the children's development. Moreover, the creativity and climate scores have a significantly high correlation, and the results from path analysis suggest that creative organizational climate of school has significant impact on all of the seven dimensions of the BTCT.

Key words

Creative organizational climate, creativity development, the Beijing Test of Creative Thinking

Introduction

Firstly, theoretical and empirical studies about creativity development of children and creative organizational climate will be introduced. Secondly, we will describe the planning and the psychometric properties of two tests of creative thinking, which are designed to measure verbal and figural creativity. Finally, the creativity development of Chinese children, the creative organizational climate of school, and the relations between them are analyzed. The purpose of the present study is twofold: to develop reliable and valid tests of creative thinking, and to explore the relations between creativity development of children and creative organizational climate of school.

Creativity development of children

As Sawyer et al. (2005) outline in their book the connections between creativity and development are rarely studied, because the two fields, creativity research and developmental psychology research have proceeded independently and have a different research focus. Actually, most of the creativity research is related to studies on adults, conducted by personality or social psychologists. Sawyer et al. (2005) gave an example: there is rarely any study on children or with a developmental focus published in the *Creative Research Journal*. Another example given from Sawyer et al. (2005) was that at the biggest academic conferences on child development -the 1999 and 2001 Society for Research in Child Development (SRCK) meetings- there were only a handful of papers about creativity. The present study will focus on the connections between creativity and development, specifically, creativity development of children and its influences of creative organizational climate of school.

Theoretically, one of the oldest oppositions in developmental theory is that between the theories who claim that development is a process of passive transmission to the child (either from the environment or from adult instruction) and those who think that development is an active

process in which the child transforms information from the external world. Transformationist theories view development as a creative process (Lawrence & Valsiner, 1993). Both Piaget and Vygotsky view development as some form of transformation. Piaget called his theory "constructivist", emphasizing that the child invents rather than discovers new ideas. So from Piaget's view, the ideas do not exist out in the world to be discovered; rather each child invents them for himself and by himself. Moreover, the structure of each stage determines the structure of the following stage (Gruber & Vonèche, 1977).

However, Vygotsky conceived of developmental and creative processes as internalization or appropriation of cultural tools and social interaction. Moran and John-Steiner (2005) found that what is usually referred to as creativity in Western psychology involves externalization in Vygotsky's and his followers' thinking. Externalization is the construction and synthesis of emotion-based meaning and cognitive symbols. When these meanings and symbols are expressed they are embodied in cultural artifacts -creative products- that endure over time to be used by future generations. The dynamic constructions that result from externalization are materialized meanings, composed of shared ideas, beliefs, knowledge, emotions, and culture. Just from this meaning, Vygotsky thought that the two social processes, internalization and externalization, and the two symbol-based forms, personality and culture, are in dialectical tension with each other. This tension provides fertile ground for the growth of new ideas and creative products. So this internal/external movement becomes cyclical, connecting past to future, and the results of these processes over time contribute to a community's history and culture. Creativity, then, depends on development, and development depends on creativity. The two are interdependent. Figure 1 (Moran & John-Steiner, 2005) provides a visual map of this relationship. So we can see clearly the difference between Piaget and Vygotsky on the connections of development and creativity. How about the empirical research on the creativity development?
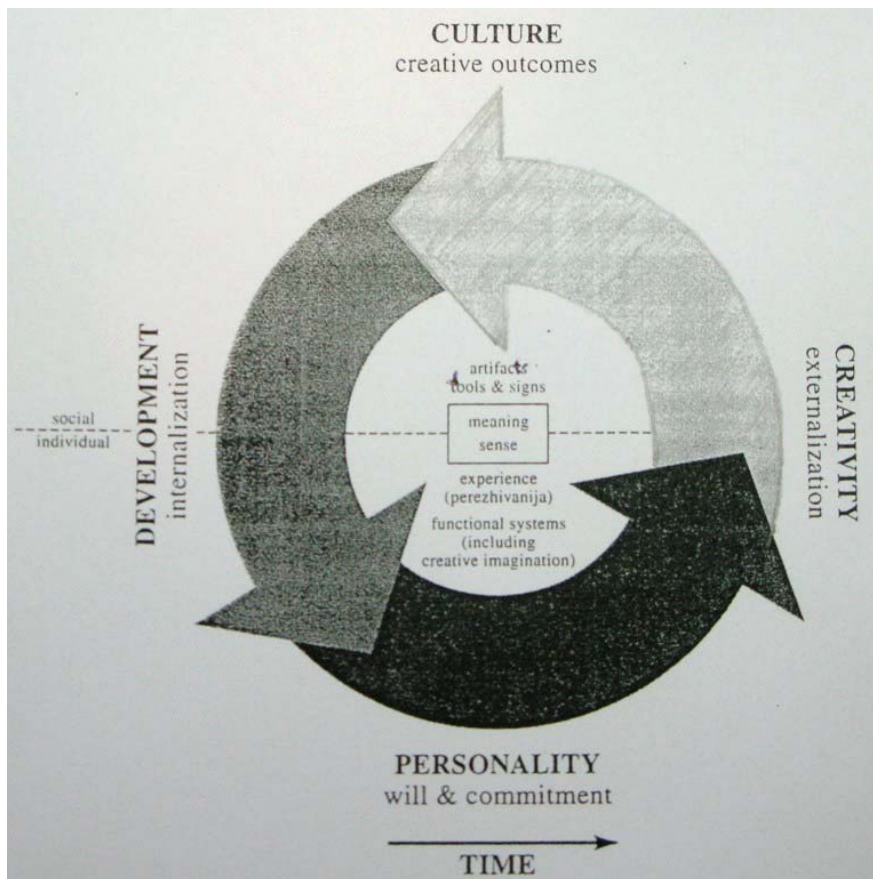
Figure 1. A visual representation of Vygotsky's dialectical conception of development and creativity

The best known test of general creativity perhaps is the Torrance Test of Creative

Thinking (TTCT, Torrance 1990, 1998, 2008), which contains over 2, 000 entries (Torrance,

2003). It is a paper-and-pencil test, which bases on the concept of divergent thinking abilities.

Items are scored for fluency, flexibility, original, and elaboration in some subscales. Torrance

(1962) found that from Grade 1 through Grade 3 the creativity of children increased steadily, and

the exception was that between the third and fourth grades there is a sharp decrease. Then there

was some recovery during fifth and sixth grades. Between the sixth and seventh grades there was

another drop. After Grade 7 the growth of creativity continued until near the end of the high

school years. This was the general pattern of the developmental curve of most of the creative thinking abilities.

The researcher of the Union College Character Research Project (Ligon, 1957, cited from Torrance, 1962) has reported some results concerning the age-level characteristics. Firstly, the creative imagination of the child between six and eight takes a turn toward realism, to the extent that the child tries to reproduce details even in play; Secondly, the child between eight and ten is increasingly able to use a variety of skills in being creative and can discover ways for using his unique abilities creatively; Thirdly, the ten-to-twelve year old youth delight in exploration, girls preferring to explore in books and in pretend play and boys, through firsthand experiences. According to Ligon, it is a great age for reading. They have now become less restless and can read or think for long periods. Artistic and musical aptitudes are developing rapidly at this time; Fourthly, children between twelve and fourteen begin to be concerned with the activities of the moment, rarely plans for the future. During this stage, gifted children produce high level performance in imaginative, artistic, musical, and mechanical fields; Fifthly, children between fourteen and sixteen care much of the imaginative activity and seem to be focused on a future career; Finally, the sixteen-to- eighteen year old children can control own imagination and make it clear between what is important and what is not. At this stage, aesthetic interests and skills should be encouraged.

Hu and his colleagues (Hu, 2001) administered the Scientific Creativity Test for Secondary School Students to 1,190 adolescents aged 11 to 15 from 6 suburban middle schools in England and 1,087 adolescents aged 12 to 18 from 2 suburban middle schools in China. Result indicated that: (1) the age difference of scientific creativity of adolescents is significant, and with a tendency to increase, but a decrease at 14. The key periods for the rapid development of adolescents' scientific creativity are from 11 to 13 and from 14 to 16 years old. (2) There are sex

differences in the scientific creativity of adolescents. English females' scientific creativity is evidently superior to males'. But Chinese males' scientific creativity is superior to females', and the difference is not remarkable. Based on this result and other studies, they proposed the culture model of sex difference of scientific creativity. (3) There is marked difference in scientific creativity between Chinese and English adolescents. Chinese adolescents' creative problem solving ability is evidently superior to that of English adolescents. But English adolescents' other scientific creativity and whole scientific creativity are evidently superior to that of Chinese adolescents. (4) There is marked difference in scientific creativity among students in different kinds of Chinese schools. Key-middle-school-subjects' scientific creativity is evidently superior to that of ordinary-middle-school-subjects.

Creative organizational climate

 "Every inventor, even a genius, is always the outgrowth of his time and environment. His creativity stems from those needs that were created before him, and rests upon those possibilities that, again, exist outside of him… Creativity is a historically continuous process in which every next form is determined by its preceding ones" (Vygotsky quoted in Van der Veer and Valsiner, 1991, p. xi).

Vygotsky paid more attention to the context of the outgrowth of creativity and he thought that children first learn to create, manipulate, and give meaning to signs and symbols through play. Play also allows them to tease out relationships, try on and practice different roles, and exercise their growing capabilities (cited from Moran and John-Steiner, 2005). Other researchers also support Vygotsky's notion that play is associated with later creativity, especially with divergent thinking (Russ, Robins, & Christiano, 1999). So a life environment of a child with enough opportunities to play seems to be necessary for the creativity development of a child. On

one hand, children should have time and freedom to play, and on the other hand, they should have place and atmosphere to play.

The social psychological perspective focuses on creativity as an individual behavior influenced by others. Many studies have investigated how others, in the context of social situations, can affect creative performance by affecting motivation. In the componential model of creativity (Amabile, 1983, 1996), task motivation is one of the three major components of creativity, along with domain-relevant skills and creativity-relevant processes. Amabile (1993) proposed that individuals are intrinsically motivated when they seek enjoyment, interest, satisfaction of curiosity, self-expression, or personal challenge in their work. A study (Tighe, Picariello & Amabile, 2003) also demonstrated that teacher's attitudes, perceptions, beliefs, and behaviors can have an important influence on children's intrinsic motivation and creativity. The teacher can serve as an important model of intrinsic motivation. The students of teachers who believe in the importance of student autonomy tend to be curious, prefer challenging work, and desire to master work independently. When children perceive that their teachers have relative high internal motivation toward work, the children themselves are more intrinsically motivated and perceive themselves as more competent and more creative. Furthermore, when children perceive greater warmth from their teachers, the children appear to be more intrinsically motivated and more creative than children who do not perceive their teacher to be warmth. In addition, researchers found some important personality traits of teachers whose students showed higher creative expression: interested in children, satisfied, enthusiastic, courteous, and professional (Tighe, Picariello & Amabile, 2003).

There are many subjective and objective variables that can influence teachers' motivations, attitudes, perceptions, beliefs, and behaviors. Because generally teachers pay much time in their schools or own departments and they have many interactions with their leaders, colleagues, and

other workers, the variable of organizational climate could be a significant one. Especially the

creative organizational climate could be a core variable that can influence teachers' mental

situation and behaviors, and then influence the creativity development of their students.

Climate has been defined in different ways by different investigators (Rousseau, 1988).

Commonly, climate held to be reflected in peoples' perceptions of, or beliefs about,

environmental attributes shaping expectations about outcomes, contingencies, requirements, and

interactions in the work environment (James, James, & Ashe, 1990; Parker et al., 2003). The

typical climate questions are just like whether "people are not afraid to take risks around here" or

whether "employees feel free to express their ideas to bosses" etc. From these kinds of questions,

we can find that climate is held to be a domain referenced phenomenon (e.g., climate for

creativity, climate for service) in which multiple variables, or dimensions, influence the outcomes

or performances in the domain under consideration (Hunter et al., 2007). There are several

theoretical frames that have been used to concretely assess climate variables.

Amabile and Conti (1999) used the KEYS, which was an instrument to assess the work

environment for creativity, together with several other variables, including perceived uncertainty

and chaos, job satisfaction, morale, and feelings. The results indicated that the effect of

downsizing on creativity was fully mediated by the KEYS scale. Thus, this finding indicated that

the work environment is of major importance to creativity in organization. KEYS consisted of ten

scales. The first six scales are hypothesized to encourage creativity, those were: (1)

Organizational Encouragement, (2) Supervisory Encouragement, (3) Work Group Support, (4)

Sufficient Resources, (5) Challenging Work, and (6) Freedom. Two scales, named

"Organizational Impediments" and "Workload pressure", were hypothesized to relate negatively

to creativity, and two criterion scales assess perception of the organization actual creativity and

productivity.

A research group at the Frankfurt University (Preiser, 2007) developed questionnaires in order to assess the quality of the learning and working environment in various organizations, such as kindergartens, schools, business, and administrations: KIK (Kreativitäts- und Innovationsfreundliches Klima, or Creative and Innovative Climate). These questionnaires are used for the research and improvement of the learning and working environment. There were four main aspects concerning the creativity atmosphere in their findings: (a) activation of curiosity, thinking, and action through stimulating learning and working environments; (b) goal-oriented and intrinsic motivating settings; (c) an open and trusting atmosphere; and (d) fostering personal freedom and nonconformity (Preiser, 2006).

Other research groups in Germany gained similar results concerning the relevance of leadership and atmosphere for innovative processes: Perceived press for change, expected changeability of the work processes, and professional stimulation proved to enhance innovations (Krause, 2004).

Chiou (2006) developed a Creative Organizational Climate Inventory (COCI) to assess the degree of organizational climates that may facilitate or inhibit employee's creativity. He found that there were seven main categories/factors of influencing the organizational creativity, including "organizational idea", "working style", "resource availability", "teamwork operation", "leadership efficacy", "learning and progress", and "environmental atmosphere".

Mathisen and Einarsen (2004) provided a review of the available instruments for measuring work environments conducive to creativity and innovation. They concluded that the instruments reviewed demonstrated acceptable criterion validity, indicating that it is in fact meaningful to assess the work environment to predict the potential for creativity or innovation in organizations or groups.

Hunter, Bedell and Mumford (2007) conducted a meta-analysis to exam 42 prior studies in which the relationships between climate dimensions, such as support and autonomy, and various indices of creative performance were assessed. These climate dimensions were found to be effective predictors of creative performance across criteria, samples, and settings. It was found, moreover, that these dimensions were especially effective predictors of creative performance in turbulent, high-pressure, competitive environments.

This study

The aim of the present study is to examine the relations between the creative organizational climate of school and the creativity development of children from 10 to 16 years old. Due to the same cultural background, we use Chiou's Creative Organizational Climate Inventory (COCI, 2006) as the instrument to assess the creative organizational climate of school. For creativity, based on Torrance's theoretical structure of TTCT we want to develop new tests of creative thinking, which should be proper to Chinese users. TTCT has classic standard in creativity research and acceptable reliability and validity. So the question is why we want to develop new creative thinking tests. First of all, by now there is no strict Chinese norm for TTCT and the only revised version of TTCT in China was in 1980s; Secondly, no matter Form A or B of the full version of TTCT take relatively too much time to complete, and in the present study we have other instruments, so we have to use a shorter one; Thirdly, by now the available Chinese scales or tests of creativity are not proper for the aim of the present study, and the two tests, "Unusual uses of chopsticks" and the Chinese character "人" developed by Wu and his colleagues (Wu, 1998) were also not proper for the international comparison, because it was culturally unfair for other non-Chinese users.

Based on the reviews mentioned above, we have the following hypotheses:

H1. The new creativity test would have an acceptable reliability.

H2. The creativity scores of children would increase from 10 to 16 years old.

H3. The creativity scores of children in secondary school would be significantly higher than those in elementary school.

H4. The creative organizational climate scores of the teachers born in 1980s would be significantly lower than those of the teachers born in 1970s and 1960s.

H5. The creativity and climate scores would have a significantly high correlation and the school climate variable would have significant influences on creativity of children.

Method

Participants

110 teachers (31 males, 76 females and 3 unidentified) and 562 students (193 females, 366 males and 3 unidentified) were recruited. They are from one elementary school and one secondary school in Jiangsu Province of China. The mean ages for the teachers and the students were 26. 57 ($SD = 7.38$) and 12.81 ($SD = 1.72$), respectively. There were 331 students and 91 teachers from the elementary school and 231 students and 19 teachers from the secondary school. They were recruited on a voluntary basis, and forms were completed during class periods (see Table 1).

Of these teachers, 35, 34, 15 and 24 of them teach Chinese, Math, English and Science respectively. The other 2 were unidentified. 7, 77 and 20 were born in 1960s, 1970s and 1980s, and the other 6 of them were unidentified. 27, 33, 12, 10 and 15 of them have 1, 2, 3, 4 and 5 years teaching experience, respectively. 19 of the teachers have gotten bachelor's degrees. 63 of them have graduated from junior colleges of higher education. 22 of them finished their study of pedagogical secondary schools. And the educational background of the other 6 teachers was unidentified.

Table 1

The numbers of participants in different age-groups

Age	10	11	12	13	14	15	16	Sum
N	34	111	160	69	86	63	39	562

Materials

Beijing Test of Creative Thinking (BTCT)

According to the subtests "Unusual Uses of Tin Can" and "parallel lines" of TTCT (Torrance 1990, 1998, 2008), the verbal (Unusual Uses of Scoop) and figural (cross) form of the creativity thinking test was developed (see Appendix). Because most of the works were done in Beijing, we named the test Beijing Test of Creative Thinking (BTCT). The two tests take about twenty minutes. With the evaluating form, seven scores of creative thinking would be obtained, those are, Fluency, Flexibility, and Originality of verbal creative thinking and Fluency, Flexibility, Originality and Elaboration of figural creative thinking, respectively.

The evaluating principles and methods are the same like TTCT, but more concrete. For each test an evaluating handbook was developed based on the sampling of 562 students. In the evaluating handbook of Unusual Uses of Scoop 27 evaluating dimensions, such as music, toy, science etc., were included. And in the evaluating handbook of Cross there were 37 dimensions.

Creative Organizational Climate Inventory (COCI)

Creative organizational climate was measured by a 35-item COCI to teachers in the two schools. COCI was developed by Chiou (2006) to assess the degree of organizational climates that may facilitate or inhibit employee's creativity (e.g., item 34. "Our school emphasizes the value of freedom, openness, innovation and transform."). COCI was developed to assess creative organizational climate in the Research & Development department, and we made small changes

in statements to make it proper for the usage in school. It is composed of seven subscales like

mentioned above on a 7-point scale ranging from 1 (absolute right) to 7 (absolute wrong).

Cronbach's α was .97 for the total scale, .82 to .95 for the seven subscales. A series examinations

of scale validation was also done, indicating a relevant relationship with criterion measures.

<div align="center">Results</div>

Development and psychometric properties of BTCT

Discrimination

The item discrimination was calculated in terms of a *t* ratio, taking the upper and lower 27

percent cases of the sample. Items were only considered for the final form of the test if the *t* value

was significant at the 0.01 level or less.

Internal consistency

The degree to which the scores consistently measured the abilities defined by the test was

determined by computing the Cronbach Alpha coefficient of internal consistency. The Cronbach

α value based upon scores of 148 secondary school students are for the subtest "scoop" .88 and

for the subtest "cross" .81, respectively. This is a satisfactory indication of internal consistency.

Inter-scorer reliability

Because there is some kind of subjectivity, when the scoring rules are interpreted to

evaluate the tests, it was necessary to ensure that the scoring system could be interpreted reliably

by someone who had not been involved in the development of the test. Scores for 20 students

were obtained independently by four scorers. One was the main researcher. The others were not

associated with the research project. The reliability coefficients among the four sets of scores are

presented in table 2. The correlations between scores vary from 0.88 to 1.00. The results suggest

that the scoring procedure is adequately objective (see Table 2).

Table 2

Agreement among 4 scorers (N = 20 answer sheets)

dimensions	V-FLU	V-FLE	V-ORI	F-FLU	F-FLE	F-ORI	F-ELA
agreement	.99	.99	.98	1.00	.99	.99	.88

Note. V-FLU = the dimension of Fluency of verbal creativity; V-FLE = the dimension of Flexibility of verbal creativity; V-ORI = the dimension of Originality of verbal creativity; F-FLU = the dimension of Fluency of figural creativity; F-FLE = the dimension of Flexibility of figural creativity; F-ORI = the dimension of Originality of figural creativity; F-ELA = the dimension of Elaboration of figural creativity. The following is the same as well.

The relationships between creative thinking and creative organizational climate

Gender, age, teaching subject, school, and teaching duration differences in COCI

At first, an ANOVA was conducted to examine the gender, age, teaching subject, school and teaching duration differences of teachers in creative organizational climate. Gender was taken as the covariate variable. Very significant teaching duration differences were found, F (4, 86) = 3.92, p < .01. It demonstrated that the longer the teaching duration, the higher the creative organizational climate the teachers have. Concretely, the COCI scores of the teachers who have 1 to 5 years teaching duration were 3.84, 4.42, 4.76, 4.45 and 4.97, respectively. There was also significant age difference, F (2, 86) = 3.83, p < .05. The results suggested that the COCI scores of different old teachers were different. The teachers born in the 1960s gained the highest COCI score (mean = 4.93), and the scores of the teachers born in the 1980s were the lowest (mean = 4.41). The 1970s-born teachers' COCI scores were between them (mean = 4.47). Moreover, the effect of two-way school × teaching subject interaction was also found significant, F (2, 86) = 4.99, p < .05. The results suggested that the school differences of COCI scores were affected by

the different teaching subjects. In elementary school the teachers who teach foreign language gained the highest COCI scores (mean = 4.70), however, in secondary school the highest COCI scores were obtained by science teachers (mean = 4.81). The science teachers' COCI scores of elementary school (mean = 4.42) were the lowest and the Chinese-teaching teachers' COCI scores of secondary school (mean = 4.36) were the lowest. There were no gender, teaching subject, school and other significant interactions found. Because the core aim of the present study is not COCI, there is no need to analyze the concrete seven dimensions of it here.

Gender, age and school differences in seven dimensions of two creative thinking tests

At first, a MANOVA was conducted to test gender, age and school differences in seven dimensions of two creative thinking tests. A very significant school difference was found, F (7, 497) = 17.15, $p < .001$. It suggested that the students of elementary school obtained significantly higher scores than the students of secondary school in seven dimensions of creative thinking (see Figure 2 and Table 3). No significant age differences were found, F (7, 497) = .75, $p = .88$ and there was also no gender difference F (7, 497) = .52, $p = .82$.
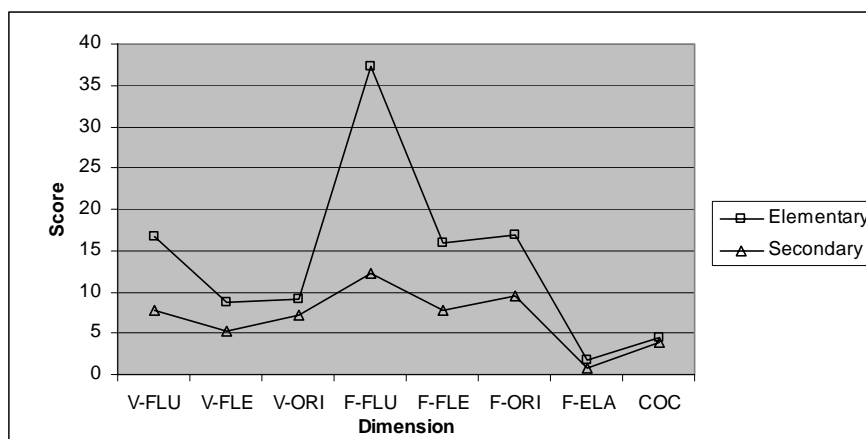

Figure 2. Differences between elementary and secondary students and schools

Table 3

Differences between elementary and secondary school

school	V-FLU	V-FLE	V-ORI	F-FLU	F-FLE	F-ORI	F-ELA	COC
Elementary	16.79(13.54)	8.81(4.82)	9.14(10.95)	37.23(16.62)	15.99(5.46)	16.98(12.51)	1.81(3.46)	4.56(.78)
Secondary	7.76(5.12)	5.30(3.02)	7.15(6.70)	12.23(7.12)	7.84(3.71)	9.52(8.40)	.69(1.41)	3.94(.85)
mean	13.41(11.98)	7.50(4.56)	8.38(9.63)	28.41(18.46)	13.05(6.22)	14.30(11.63)	1.45(2.93)	4.33(.30)

Note. COC = creative organizational climate. The following is the same as well.

Concerning the age differences, because there were seven age groups, a Post Hoc (LSD) was used to check the age differences among different age groups. The results demonstrated that on the dimensions of fluency, flexibility of verbal and figural creativity, on the dimension of originality of figural creativity, the 10, 11, 12 and 13 year-old students gained significantly higher scores than the 14, 15 and 16 year-old children. On the dimension of originality of verbal creativity 11 and 12 year-old students gained significantly higher scores than 13 and 14 year-old students. On the dimension of elaboration of figural creativity 10 and 11 year-old students gained significantly higher scores than 12 to 16 year-old students, and 13 year-old students gained significantly higher scores than 14 to 16 year-old students (see Figure 3 and Table 4).

Creative organizational climate and creative thinking

A Univariate ANOVA was conducted to test school, gender, subject, age and teaching experience differences of students in COCI. Only a significant school difference was found, F (1, 103) = 5.25, $p < .05$. It suggested that the COCI score of elementary school (mean = 4.56) is significantly higher than that of the secondary school (mean = 3.94) (see Figure 2 and Table 3).
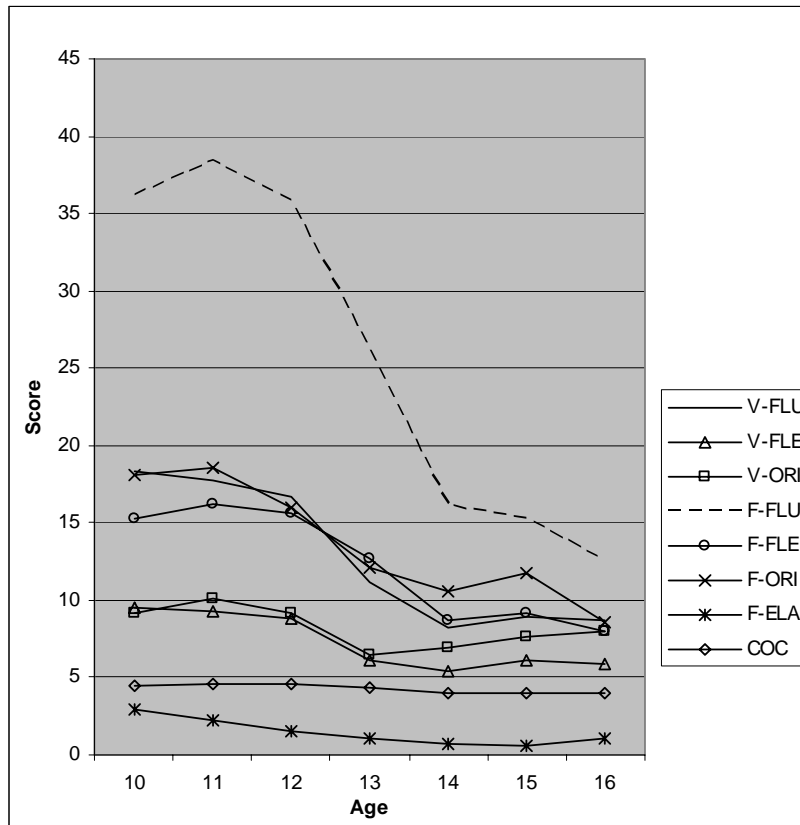
Figure 3. Descriptives of creativity scores and creative organizational climate of students

Table 4

Descriptives of creativity scores and creative organizational climate of students

age	10	11	12	13	14	15	16	mean
V-FLU	18.29(3.78)	17.74(1.29)	16.68(1.08)	11.13(1.39)	8.25(.70)	8.94(.89)	8.71(1.15)	13.41(11.98)
V-FLE	9.53(1.17)	9.25(.46)	8.82(.39)	6.07(.48)	5.36(.34)	6.10(.43)	5.87(.68)	7.50(4.56)
V-ORI	9.12(2.81)	10.07(1.05)	9.19(.91)	6.46(.96)	6.98(.63)	7.65(.98)	7.97(1.51)	8.38(9.63)
F-FLU	36.24(4.13)	38.43(1.61)	35.79(1.37)	26.25(2.13)	16.07(1.47)	15.26(1.49)	12.62(1.56)	28.41(18.46)
F-FLE	15.29(1.22)	16.21(.54)	15.62(.45)	12.73(.74)	8.73(.52)	9.11(.62)	7.95(.75)	13.05(6.22)
F-ORI	18.06(3.48)	18.62(1.31)	16.02(.96)	12.05(1.23)	10.54(1.00)	11.76(1.31)	8.59(1.26)	14.30(11.63)
F-ELA	2.94(1.24)	2.29(.41)	1.49(.23)	1.10(.27)	.71(.15)	.61(.15)	1.10(.36)	1.45(2.93)
COC	4.49(.20)	4.55(.06)	4.54(.10)	4.35(.29)	4.02(.20)	3.99(.17)	3.96(.10)	4.33(.30)

For each age group of students a COCI score was calculated (see Figure 3 and Table 4). ANOVA was conducted to examine age group difference. A very significant age group difference was found, $F(6, 546) = 217.73$, $p < .001$. The results demonstrated that the level of COC in different age groups is significantly different. A post hoc tests with LSD showed that the COCI scores of the 10, 11 and 12 year-old group were significantly higher than those of the 13, 14, 15 and 16 year-old group, and the COCI score of the 13 year-old group was significantly higher than those of the 14, 15, and 16 year-old group, and the COCI score of the 14 year-old group was also significantly higher than that of the 16 year-old group. The whole trend was that the older the students become, the lower the level of creative organizational climate of school turns to be.

The intercorrelations among seven dimensions of creative thinking and COCI demonstrated that there were very significant correlations not only among seven creative thinking subscales, but also between creative organizational climate and creative thinking (see Table 5). Firstly, the results implied that general creativity has a stable consistency and structure. Secondly, the results suggested that the higher the creative organizational climate of a school, the more creative the students in the school. To testify the statement more concretely and deeply, a path analysis was conducted (see Figure 4).

Path analysis was used to examine the relationships between the creative organizational climate (COC) and the seven dimensions of creative thinking. The path coefficient from COC to Fluency of verbal creativity thinking (VCT) was .32 ($p < .001$). The path coefficient from COC to Flexibility of VCT was .34 ($p < .001$) and the coefficient COC to Originality of VCT was .08 ($p < .05$). Between the COC and figural creative thinking (FCT), the path coefficient from COC to Fluency of FCT was .66 ($p < .001$). The path coefficient from COC to Flexibility of FCT was .64 ($p < .001$), from COC to Originality of FCT was .27 ($p < .001$), and the coefficient from COC

to Elaboration of FCT was .12 ($p < .001$).

Table 5

Intercorrelations between creativity scores and creative organizational climate (p=< .01)

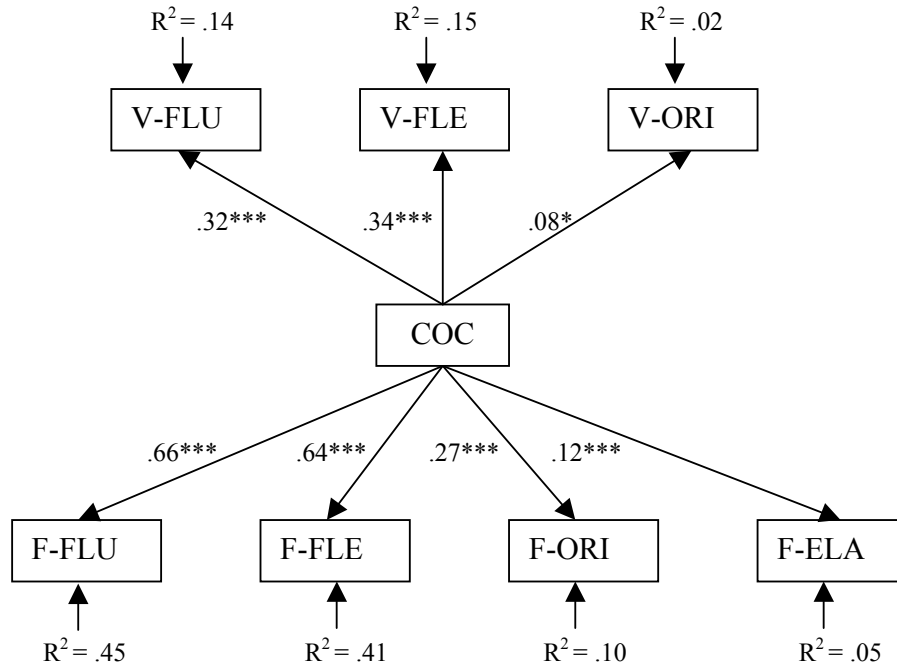|	V-FLU	V-FLE	V-ORI	F-FLU	F-FLE	F-ORI	F-ELA
V-FLE	.91						
V-ORI	.86	.74					
F-FLU	.45	.46	.29				
F-FLE	.46	.49	.30	.93			
F-ORI	.51	.45	.48	.68	.64		
F-ELA	.33	.27	.32	.30	.23	.41	
COC	.37	.37	.10	.66	.63	.31	.20

Figure 4. Path analysis of creativity scores and creative organizational climate

Note. * $p < .05$; ** $p < .01$; *** $p < .001$.

All of the effects were calculated by direct effect of COC on creative thinking. In general, about 14%, 15% and 2% variance of Fluency, Flexibility and Originality of VCT can be explained by the COC, F (3, 527) = 28.97, $p < .001$, F (3, 527) = 30.59, $p < .001$ and F (3, 527) = 3.07, $p < .05$, respectively. For the FCT, COC can explain 45%, 41%, 10% and 5% variance of Fluency, Flexibility, Originality and Elaboration of FCT F (3, 540) = 143.43, $p < .001$, F (3, 540) = 123.71, $p < .001$, F (3, 540) = 19.98, $p < .001$ and F (3, 540) = 9.63, $p < .001$ respectively (see Figure 4).

Discussion

Our study focused on the development of Beijing Test of Creative Thinking (BTCT) and exploring the characteristics of the creativity development of children from 10 to 16 years of age and the creative organizational climate of their schools and the relations between the two variables.

Creative thinking development of children

The results demonstrated that the psychometric properties of the BTCT were satisfactory. Reliability suggested that the test can be seen as a proper instrument for the present study. So the hypothesis 1 was partly confirmed.

The results suggested that the creativity scores of children do not increase from 10 to 16 years of age. There was no significant age difference. So the hypothesis 2 was not confirmed. Especially the scores of children from 10 to 14 years of age decrease on all of the seven dimensions, then from 14 to 16 there was a small upward trend. The results seem not to support the whole findings of Torrance (1962) that from Grade 1 through Grade 3 the creativity of children increased steadily, and the exception was that between the third and fourth grades there is a sharp decrease. Then there was some recovery during fifth and sixth grades. Between the sixth and seventh grades there was another drop. After Grade 7 the growth of creativity continued

until near the end of the high school years. Torrance found that only between the third and fourth grades there is a sharp decrease, which he calls the "fourth grade slump". In the present study the slump was found from 14 to 16 years of age. It is somewhat later than the American students. However, it should be mentioned that the two samples have the time interval of more than 40 years. The findings in the present study seem not to support the findings of Zhou and his colleagues (Zhou, Zha & Shi, 1995) that the technical creativity scores of the seventh grade children were significantly higher than those of the fifth grade children, and that the scores increase during the three years in the longitudinal study.

The creativity in this study is general creativity. Compared with the findings of Hu and his colleagues (Hu et al., 2004) about scientific creativity, they also found the scientific decreases at 14 years of age, but there was a marked age difference, and the key periods for the rapid development of adolescents' scientific creativity are from 11 to 13 and from 14 to 16 years old. In the present study the results were different from that. Of course, the two studies were cross sectional designs with different age cohorts. Probably the age differences are not related to developmental differences but to other aspects resulting from cohort/period effects. So the longitudinal study with the same participants of children/adolescents followed over several years is needed to confirm the hypothesis.

In the present study there was also no gender difference on the seven dimensions of BTCT. The findings also do not support the results of Hu and his colleagues' (Hu et al., 2004). They found British female's scientific creativity was evidently superior to males'. But Chinese male's scientific creativity was superior to females', and the difference was not remarkable. Zhou and his colleagues (Zhou, Zha & Shi, 1995) also found the gender differences that both Chinese and German females obtained higher scores than males, only Chinese super gifted males gained higher scores than females.

From the developmental trend of creativity scores of children from 10 to 16, it is easy to understand that the creativity scores of children in elementary school were significantly higher than those of children in secondary school. It was somewhat surprising, but Hypothesis 3 was not confirmed. Also, the results seem not to support the findings of Torrance (1962) or the claims of Ligon (1957, cited from Torrance, 1962). As Sawyer and his colleagues (2005) mentioned, there was rarely any research focused on the connections between creativity and development. Actually the approach of creativity development is just a necessary direction to examine the connection. In future, more studies are needed to examine the creativity development and its influences, such as creative organizational climate.

The next question is why the general creativity of children decreases during their growing process. Torrance (1962) mentioned in his study that at the beginning of the high school period, the decline of creativity expression is the result of new pressure to conformity inherent in the tradition. He suggested that there is a need for studies in schools having seven- and eight-grade elementary schools and for longitudinal studies to obtain clarification of the major causal factors.

Creative organizational climate of school

In the present study the variable that could influence the creativity development of children was examined. It is creative organizational climate of school. We found the teaching duration differences on the perception of the climate. It demonstrated that the more teaching experience the teachers have, the better they can perceive creative organizational climate. So the perception of creative organizational climate is related to the professional level of the teachers. Those teachers who have more teaching experience and more communication chances seem to have more freedom to design their classroom, lessons, or teaching styles. Although it is impossible for a teacher to automatically become an expert from novice, each of them has the opportunity to grow in their professional field from novice to proficient, from proficient to expert

teacher. Sternberg and Horvath (1995) developed a prototype view of expert teaching. They thought that the prototype expert is knowledgeable and is more effective than a novice. Moreover, experts are more likely to arrive at creative solutions to problems - solutions that are both novel and appropriate. Although the expert teachers do their jobs in the same work place like a novice, they have better perception of the organizational climate than the novice teachers.

Then we can easily understand the second difference, the age difference, which confirmed hypothesis 4. The relatively older teachers who were born in 1960 or earlier are almost the expert teachers. The teachers who were born in the 1980s, have probably the least teaching experience, and most of them were born under the one-child policy. It is probably the reason why their perception of creative organizational climate was the lowest. Jiao and her colleagues (Jiao, Ji & Jing, 1986) found that Chinese "only children" are more egocentric, whereas sibling children possess the positive qualities of persistence, cooperation, and peer prestige. And they also found that the occupation and educational background of parents and the number of generations living together are not decisive in determining the behavioral qualities of Chinese children in the Beijing area under study. So when the only children become teachers in school, they can be more egocentric and less cooperative than their colleagues of 1970s or 1960s, and this element can interact with the novices' teaching level. Therefore, they perceive a relatively lower creative organizational climate. Moreover, they have probably a higher and stricter standard about what is an ideal creative organizational climate than their colleagues of the 1960s or 1970s. Rosenberg and Jing (1996) thought that in China the impact of changing family structure on culture and values could be very deep. They gave an example that China has a history of strong cultural emphasis on the family, and usually it is the father who held the absolute authoritarian position in the family. However, after the one-child policy, traditional family structures and parental practices changed considerably. The child will have greater freedom and greater say, and the

researchers thought that a more interactive parent-child relationship is potentially a precursor of a more democratic environment. So they probably need at work also a more democratic climate than their colleagues from 1960s and 1970s. As this greater value is placed on the individual, ultimately the culture will reflect this change. This point could be also the reason why teachers from the 1980s obtained the lower scores of COCI.

The significant effect of two-way school × teaching subject interaction suggested that probably the foreign language teachers of elementary school and the science teachers of secondary school have greater freedom to organize their works than other teachers in respective schools. On the contrary, the science teachers of elementary school and the Chinese teachers of secondary school probably have the lesser freedom to do their teaching than other teachers in respective schools. The reason could be the characteristics of the subjects, teaching style, and interaction experiences. More study is needed to focus on the topic.

Creative organizational climate of school and the creative thinking development of children

For the children, the scores of the creative organizational climate of the elementary school were significantly higher than those of the secondary school. Probably the test and teaching pressure of the secondary school is much bigger than that of the elementary school, so the students of the secondary school have to do many things not related to creativity, but related to the homework, knowledge from the teaching books, so the teachers of the secondary school have to pay more attention to the test. The climate for both of them appears not as free and interesting as in the elementary school.

When the two variables were analyzed together, we could see that both the creative organizational climate of school and the creative thinking development of children were decreased during the children's development. The creativity and climate scores have a

significantly high correlation and the school climate variable showed significant influences on creativity of children. The path analysis suggested that creative organizational climate of school has significant impact on all of the seven dimensions of BTCT. This was only the analysis of direct effect. The explanation ratio of variance was from 2% to 66% of creative thinking. So hypothesis 5 was also confirmed. Of course, the impact or influence here is not in the meaning of causality, but correlation. How can we understand the developmental trend?

First of all, there is probably also some kind of "fourth grade slump" of creativity development for the children from 10 to 16 years of age, especially for the Chinese children, because in Torrance's research (1962) only American children were recruited. This kind of slump probably comes from the natural development process of creativity. The explanation for the decrease of COCI score could be, on the one hand, that the teachers or leaders in secondary school can not build up more free and more creative climate, as they lack the ability; One the other hand, they may have the ability but do not want to exercise it because they do not need it.

Theoretically, Vygotsky agreed with Piaget that they did not explain the origins of complex mental phenomena. Whereas Piaget explained mental schemas by documenting their emergence from individual-environment interaction, Vygotsky used some sociological theory in proposing that irreducible psychological wholes originate in collective life; He believed in the social origins of higher psychological processes, which influenced by both Marx and by the Durkheimian school of French sociology (Sawyer, 2005). As a kind of higher psychological process, creativity has also its social and individual origins. The creative organizational climate of school seems to be one of the social origins in the creativity development. The findings seem to support the claims of Urban (2003) that the environmental conditions of various systems may discourage, inhibit, and suppress or nurture, stimulate, inspire, and cultivate creative processes. Environmental frames influence children's development of creativity, actual creative processes,

and finally the acceptance and appreciation of creative products. The creative organizational climate in the elementary school discourage the children's creativity, on the contrary, the climate in the secondary school probably inhibit the creativity of children. The results in the present study seem also to support the findings of the meta-analysis by Hunter, Bedell and Mumford (2007). They reviewed 42 prior studies in which the relationships between climate dimensions, such as support and autonomy, and various indices of creative performance were assessed. These climate dimensions were found to be effective predictors of creative performance across criteria, samples, and settings.

Niu (2007) thought that with the pressure of the National College Entrance Exam (NCEE), Chinese students live through the drill of preparing for various exams. In the shadow of the traditional educational testing systems and influences of the western testing values, all of the students culminate in the ability to combat exam-related anxieties, and the endurance developed over years of exam-preparation may help Chinese students excel in exams. However, an exam-driven knowledge-based education may result in a sacrifice of independent intellectual inquiry and creative thinking (Niu & Sternberg, 2001, 2003). At the same time, the organizational climate of school is also full of the pressure of preparing for the exams, and teachers are impossible and not necessary to design other kinds of teaching methods to promote the creative climate in their classrooms. This kind of combat begins perhaps from secondary school, or even from elementary school, and the climate of school becomes more and more nervous during the higher change of the grade. This is probably the reason why the COCI scores of secondary school were lower than those of elementary school.

From the view of developmental science (Scheithauer et al, in press), the individual history of every single person can determine the reaction style of the person to environmental factors. The personal experiences can become the part of their continuously developing

individuality and this kind of individuality in turn determines how each person reacts even to stable situations each and every time. So, the climate of Chinese school probably also promotes homogeneity of students and may diminish students' motivation or activities in everyday life to pursue their own interests rather than exam-related academic work. Because this kind of pressure is in elementary school somewhat smaller than in secondary school, the creative organizational climate in elementary school is better and the pupils have more motivation and time to pursue their own interests than the students of secondary school. But when they get into the secondary school, the exam-related academic work will become more and more, so the creativity level of the students will increase. Sooner or later, they or the whole nation will pay the price for the NCEE. Results suggest that interventions should promote the creative organizational climate of the school to increase students' creativity. Strategies for enhancing the creative organizational climate of school could be based on the knowledge about the seven dimensions of COC (Chiou, 2006), that is, organizational idea, working style, resource availability, teamwork operation, leadership efficacy, learning and progress, and environmental atmosphere. So it can be imagined that, if we want to improve the creativity level of Chinese students, partly we should have a more creative organizational climate in schools, and before that the NCEE-centered testing system must be changed and creativity- centered value or testing system should be developed.

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Chapter 5

Creative organizational climate of school and

general self-efficacy, creativity self-efficacy, cultural efficacy of teachers

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Abstract

The aim of the present study was to examine the characteristics of the creative organizational climate of Chinese schools, the general self-efficacy, creativity self-efficacy and cultural efficacy of own culture of the teachers in these schools and the analyses of the relations between the four core variables. The results demonstrated that there were significant teaching duration differences, age differences and significant two-way school × teaching subject interaction in creative organizational climate and significant gender difference in general self-efficacy. A Path analysis indicated that the significant path coefficients ranged from creative organizational climate to cultural efficacy of own culture, general self-efficacy from general self-efficacy to cultural efficacy of own culture and creativity self-efficacy, and from cultural efficacy of own culture to creativity self-efficacy. There was only an indirect pathway from creative organizational climate to creativity self-efficacy. Results suggest the development of interventions to increase creative organizational climate and general self-efficacy in educational practices.

Keywords

creative organizational climate, general self-efficacy, creativity self-efficacy, cultural efficacy

Introduction

Bandura (1986) assumed that collective efficacy is rooted in self-efficacy. Other researchers found that there were significant correlations between the three variables, general self-efficacy, creativity self-efficacy and cultural efficacy (e.g. Yi et al, 2008). The path analysis also showed that both the creativity self-efficacy and cultural efficacy were rooted in general self-efficacy (Yi et al., 2008). They concluded that on the one hand, the culture that is individual-oriented is probably more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy. On the other hand, the culture that is individual-oriented may have inhibited the development of cultural efficacy, while the collective-oriented culture is perhaps more conducive to fostering cultural efficacy. Can we examine the conclusion about the relations between culture and efficacy variables? Are there typical impacts of different cultural styles on the self- or collective efficacy?

Creative organizational climate

"Every inventor, even a genius, is always the outgrowth of his time and environment. His creativity stems from those needs that were created before him, and rests upon those possibilities that, again, exist outside of him… Creativity is a historically continuous process in which every next form is determined by its preceding ones" (Vygotsky quoted in Van der Veer and Valsiner, 1991, p. xi).

Vygotsky paid more attention to the context of the outgrowth of creativity and he thought that children first learn to create, manipulate, and give meaning to signs and symbols through play. Play also allows them to tease out relationships, try on and practice different roles, and exercise their growing capabilities (cited from Moran and John-Steiner, 2005). Other researchers also support Vygotsky's notion that children's everyday play is associated with later creativity, especially with divergent thinking (Russ, Robins, & Christiano, 1999). So a life environment of a child with enough chances to play seems to be necessary for the

creativity development of the child. On the one hand, children should have time and freedom

to play, and on the other hand they should have a place and atmosphere to play.

The social psychological perspective focuses on creativity as an individual behavior

influenced by the behaviors and characteristics of others. Many studies have researched how

others, in the context of social situation, can affect creative performance by affecting

motivation. In the componential model of creativity (Amabile, 1983, 1996), task motivation is

one of the three major components of creativity, along with domain-relevant skills and

creativity-relevant processes. Amabile (1993) proposed that individuals are intrinsically

motivated when they seek enjoyment, interest, satisfaction of curiosity, self-expression, or

personal challenge in their work. There is also a study (Tighe, Picariello & Amabile, 2003)

suggesting that teacher's attitudes, perceptions, beliefs, and behaviors can have an important

influence on children's intrinsic motivation and creativity. The teacher can serve as an

important model of intrinsic motivation. The students of teachers who believe in the

importance of student autonomy tend to be curious, prefer challenging work, and desire to

master work independently. When children perceive that their teachers have relatively high

internal motivation toward work, the children themselves are more intrinsically motivated and

perceive themselves as more competent and more creative. Furthermore, when children

perceive greater warm relationships in their teachers, the children appear to be more

intrinsically motivated and more creative than children who do not perceive their teacher to be

very warm. In addition, researchers found some important personality traits of teachers whose

students show higher creative expression: likable, interested in children, satisfied,

enthusiastic, courteous, and professional (Tighe, Picariello & Amabile, 2003).

There are many subjective and objective variables that can influence teachers'

motivations, attitudes, perceptions, beliefs, and behaviors. Because generally teachers pay

much time in their schools or own departments and have many interactions with their leaders,

colleagues, and other workers, the variable of organizational climate could be a significant

one. Especially the creative organizational climate could be a core variable that can influence

teachers' mental situation and behaviors, and then influence the creativity development of

their students.

Climate has been defined in different ways by different investigators (Rousseau,

1988). Commonly, climate held to be reflected in peoples' perceptions of, or beliefs about,

environmental attributes shaping expectations about outcomes, contingencies, requirements,

and interactions in the work environment (James, James, & Ashe, 1990; Parker et al., 2003).

The typical climate questions are just like whether "people are not afraid to take risks around

here." or whether "employees feel free to express their ideas to bosses". From these kinds of

questions, we can find that climate is held to be a domain referenced phenomenon (e.g.,

climate for creativity, climate for service) in which multiple variables, or dimensions,

influence the outcomes or performances in the domain under consideration (Hunter et al.,

2007). There are several theoretical frames that have been used to concretely assess the

climate variables.

Amabile and Conti (1999) used the KEYS, which was an Assessment of the work

environment for creativity, together with several other variables, including perceived

uncertainty and chaos, job satisfaction, morale, and feelings. The results indicated that the

effect of downsizing on creativity was fully mediated by the KEYS scale. Thus, this finding

indicated that the work environment is of major importance to creativity in organization.

KEYS consisted of ten scales. The first six scales are hypothesized to encourage creativity,

those were: (1) Organizational Encouragement, (2) Supervisory Encouragement, (3) Work

Group Support, (4) Sufficient Resources, (5) Challenging Work, and (6) Freedom. Two

scales, named "Organizational Impediments" and "Workload pressure", were hypothesized to

relate negatively to creativity, and two criterion scales assess perception of the organization actual creativity and productivity.

A research group at the Frankfurt University (Preser, 2006) developed questionnaires in order to assess the quality of the learning and working environment in various organizations, such as kindergartens, schools, business, and administrations: KIK (Kreativitäts- und Innovationsfreundliches Klima, or Creative and Innovative Climate). These questionnaires are used for the research and improvement of the learning and working environment. There were four main aspects concerning the creativity atmosphere in their findings: (a) activation of curiosity, thinking, and action through stimulating learning and working environments; (b) goal-oriented and intrinsic motivating settings; (c) an open and trusting atmosphere; and (d) fostering personal freedom and nonconformity (Preiser, 2006).

Other research groups in Germany gained similar results concerning the relevance of leadership and atmosphere for innovative processes: Perceived press for change, expected changeability of the work processes, and professional stimulation by the expertise of the superior proved to enhance innovations (Krause, 2004).

Chiou (2006) developed a Creative Organizational Climate Inventory (COCI) to assess the degree of organizational climates that may facilitate or inhabit employee's creativity. He found that there were seven main categories/factors of influencing the organizational creativity, including "organizational idea", "working style", "resource availability", "teamwork operation", "leadership efficacy", "learning and progress", and "environmental atmosphere".

Mathisen and Einarsen (2004) provided a review of the available instruments for measuring work environments conducive to creativity and innovation. They concluded that the instruments reviewed demonstrated acceptable criterion validity, indicating that it is in

fact meaningful to assess the work environment to predict the potential for creativity or innovation in organizations or groups.

Hunter, Bedell and Mumford (2007) conducted a meta-analysis to examine 42 prior studies in which the relationships between climate dimensions, such as support and autonomy, and various indices of creative performance were assessed. These climate dimensions were found to be effective predictors of creative performance across criteria, samples, and settings. It was found, moreover, that these dimensions were especially effective predictors of creative performance in turbulent, high-pressure, competitive environments.

General self-efficacy

Self-efficacy refers to "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments". The construct of self-efficacy is one core theoretical point of Bandura's socal-cognitive theory (Bandura, 1977, 1997, 2001). Researchers suggest that a high level self-efficacy is related to better mental, physical health and easier social adaptation (Schwarzer, 1992; Bandura, 1997). General self-efficacy (GSE) aims at a broad and stable sense of personal competence to deal effectively with a variety of stressful situations (Schwarzer, 1992; Schwarzer, 1999).

The General Self-Efficacy scale, developed to measure this construct at the broadest level, has been adapted to many languages (Scholz et al., 2002; Luszczynska et al., 2005). The psychometric properties of this instrument were examined among 19,120 participants from 25 countries. The previous findings confirmed that the measure is configurally equivalent across cultures, that is, it corresponds to only one dimension. The results also pointed to a number of cross-cultural differences, specifically, Japanese and Hong Kong Chinese displayed the lowest levels of GSE. The Chinese females were found to be significantly lower in GSE than males. The authors supposed that self-efficacy may be rated lower in collectivistic cultures than individualistic cultures. The Chinese were regarded as less individualistic than

Westerners, so the researchers said that it would be interesting to compare their scores in

future studies with corresponding levels of collective self-efficacy (Bandura, 1995;

Schwarzer, 1997).

Klassen (2004) reviewed critically much of the research investigating self-efficacy

beliefs through cross-cultural comparison. Two sets of cross-cultural comparison groups were

examined: Asian (or immigrant Asian) versus Western, and Easten European versus Western

European and American groups. Almost all of the 20 studies reviewed found efficacy beliefs

to be lower for non-Western cultural groups, but in some cases these lower beliefs were more

predictive of subsequent functioning. There is some evidence that the mean efficacy beliefs of

a cultural group are modified through immigration or political changes. For some non-

Western groups, collective efficacy appears to operate in much the same way as self-efficacy

operates for Western groups. Realistics -as opposed to optimistic- efficacy beliefs do not

necessarily predict poor performance for all cultural groups, as has been suggested by self-

efficacy theory. Only a minority of the researches included measurement of cultural

dimensions such as individualism and collectivism, although most of the researchers based

conclusions on assumed cultural differences. In some cases, self-efficacy was poorly defined

and bore little resemblance to theoretically derived definitions. Conclusions from this study

have implications especially for applied settings in education and business: Efficacy beliefs

and performance appear to be enhanced when training approaches are congruent with the

individual's sense of self. Lower levels of self-efficacy beliefs found in some collectivistic

groups do not always signify lower subsequent performance, but are instead reflective of

differing construals of self.

Creativity self-efficacy

Obviously, general self-efficacy is domain-general and refers to a global confidence in

one's generalized sense of self-efficacy. However, self-efficacy is commonly understood as

domain-specific; that means, one can have more or less firm self-beliefs in different domains

or particular situations of functioning. Creative self-efficacy has been defined as "the belief one has the ability to produce creative outcomes" (Tierney & Farmer, 2002). A three-item scale was developed to assess creative self-efficacy (manufacturing, $\alpha = .83$; operations, $\alpha = .87$). They used data from two different firms and tested a new construct, creative self-efficacy, tapping employees' beliefs that they can be creative in their work roles. It was also found that creative self-efficacy predicted creative performance beyond the predictive effects of job self-efficacy.

Beghetto (2006) examined correlations of creative self-efficacy in middle and secondary students (N = 1, 322). Results demonstrated that students' mastery- and performance-approach beliefs and teacher feedback on creative ability were positively related to students' creative self-efficacy. Creative self-efficacy was also linked to student reports of their teachers not listening to them and sometimes feeling that their teachers had given up on them. Students with higher levels of creative self-efficacy were significantly more likely to indicate that they planned to attend college than students with lower levels of creative self-efficacy. Finally, students with higher creative self-efficacy were significantly more likely to report higher levels of participation in after-school academics and after-school activities. Three items were used to assess creative self-efficacy ($\alpha = .86$). Specially, items in this study were intended to measure students' beliefs about their ability to generate novel and useful ideas and whether they viewed themselves as having a good imagination. The three items were (a) "I am good at coming up with new ideas," (b) "I have a lot of good ideas, " and (c) "I have a good imagination."

However, both of the measures were based on the American participants, as of now, there is no research examining the cross-language equivalence whether the theoretical construct of Creativity Self-efficacy is universal. At the same time, planning the measures were not core aspects in both of the studies, so more precise and stricter planning of the creativity self-efficacy seems to be needed. In present study we define the creativity self-

efficacy as perceived beliefs about the capability to produce novel and appropriate ideas, works, or productions.

Cultural efficacy

People do not live their lives in social isolation. They frequently need a collective effort in the face of difficulties and challenges. Bandura (1986, 1997) defined a group-level self-efficacy belief - collective efficacy - as "shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (Bandura, 1997, p. 477) and he supposed that the collective efficacy is rooted in self-efficacy, so that research on personal efficacy does not necessarily reflect an individualistic bias in psychology. Bandura (1986) thought that the strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort. So we can say that there are different levels of collective efficacy. Previous studies have investigated the collective of classroom, school, work department, sport team, and cultural group etc (Bandura, 1997).

The researchers have found disparities in the ways in which collective or group efficacy operate across cultures (Klassen, 2004). For example, for collectivists, group or collective beliefs also appear to be key motivational components that foster achievement. Earley (1993) found that managers who came from generally collectivist cultures appeared to express the highest levels of efficacy beliefs (and performance) when they believed they were working with an in-group. Conversely, managers from a predominantly individualist cultural background performed best, and expressed the highest self-efficacy beliefs, when they believed they were working alone. Earley´s study (1994) also indicated that group-level training was most effective for improving expectations, effort, and performance in managers with a collectivist orientation whereas managers from an individualist cultural orientation benefited primarily from individual-level instruction.

One of the core variables in present article is the collective efficacy of culture -

cultural efficacy, which is defined as perceived beliefs about the capability of the people in

some kind of culture to achieve goals and manage the environment. At first, the concept is a

kind of collective efficacy, which is opposite to self-efficacy, and the level of it is national, or

smaller, such as sub-cultural group, or bigger, such as a region where people share the same

language. Second, the beliefs cannot only about own culture, but also about other cultures.

Bernal and Froman (1987) developed the Cultural Self-Efficacy Scale (CSES) to

assess the perceived sense of self-efficacy among community health nurses caring for

culturally diverse clients. The nurses who completed the CSES were found to have neutral to

low self-efficacy when caring for three ethnic groups (African-Americans, Puerto Rican, and

Southeast Asians). In a second study, Bernal and Froman (1993) found that greater knowledge

of transcultural nursing through formal and informal coursework increased the nurses'

perceptions of confidence in caring for culturally diverse clients. Their findings also support

the view that interactions with diverse clients within undergraduate and work experiences

increases cultural self-efficacy. St.Clair and McKenry (1999) demonstrated that students who

experienced international clinical experiences had higher cultural self-efficacy than those who

had not. Similarly, another study demonstrated increased cultural self-efficacy scores among

students participating in learning experiences with minority populations (Williamson, Stecchi,

Allen, & Coppens, 1996). In an integrated review of the cultural self-efficacy literature

derived from the analysis of 26 published studies using the CSES spanning all regions of the

U.S., nurses reported low to neutral sense of self-confidence, while students in the U.S. report

slightly higher mean levels than their respective practicing nurses (Coffman et al., 2004).

Lowest perceptions of confidence in providing care were consistently found with Southeast

Asians, followed by Hispanics and African-Americans. Findings do indicate, however, that

coursework and educational experiences can increase students' levels of self-efficacy in

delivering culturally competent care. No published or unpublished works were found that addressed levels of confidence in caring for elders.

However, this kind of cultural self-efficacy was more about the work of eldercare or nursing, and the items of the scale were more about the eldercaring or nursing techniques (Shellman, 2006). So actually this kind of scales are working self-efficacy or working attitude for the people coming from different cultures. Furthermore, in the measurement of collective efficacy, we think self and culture are two different conception, so we use the conception of cultural efficacy.

Relations between Creative organizational climate and general self-efficacy, creativity self-efficacy, and cultural efficacy

The previous study (Yi et al., 2008) about the relations between general self-efficacy, creativity self-efficacy, and cultural efficacy demonstrated that there were significant correlations among the three variables. The path analysis showed that both of the creativity self-efficacy and cultural efficacy were rooted in general self-efficacy, which supports the thought of Bandura (1986). And there was no direct effect from cultural efficacy to creativity self-efficacy.

Based on the claims of Mau (2000), Yi and his colleagues (Yi et al., 2008) concluded that on the one hand, the culture that is individual-oriented is probably more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy. On the other hand, the culture that is individual-oriented may have inhibited the development of cultural efficacy, while the collective-oriented culture is perhaps more conducive to fostering cultural efficacy. Climate is held to be the concrete peoples' subjective perception or beliefs about some kind of cultural environment. So how about the relations between work environment and individual or cultural efficacy? It is one of the core objectives of the present study.

Research questions

On the one hand, the present article aims at examining the characteristics of the creative organizational climate of Chinese schools, the general self-efficacy, creativity self-efficacy and cultural efficacy of the teachers in these schools. On the other hand, the relations between the four core variables would be analyzed. We want to explore the relations between environmental elements such as creative climate and the individual elements such as the personal or collective efficacy. The creative organizational climate would be taken as the predictor variable, and the hypothesized mediators would be general self-efficacy and cultural efficacy, and the variable to be predicted is creativity self-efficacy.

Method

Participants

110 teachers (31 males, 76 females and 3 unidentified) were recruited. They are from one elementary school and one secondary school in Jiangsu Province of China. The mean ages for the teachers were 26. 57 (SD = 7.38). In these teachers 35, 34, 15 and 24 teach Chinese, Math, English and Science, respectively, and the other two were unidentified. 7, 77 and 20 were born in 1960s, 1970s and 1980s, and the other 6 were unidentified. 27, 33, 12, 10 and 15 had 1, 2, 3, 4 and 5 years teaching experience, respectively.

Measures

Creative Organizational Climate Inventory (COCI)

Creative organizational climate was measured by a 35-item COCI in teachers in the two schools. COCI was developed by Chiou (2006) to assess the degree of organizational climates that may facilitate or inhibit employee's creativity (e.g., item 34. "Our school emphasizes the value of freedom, openness, innovation and transformation."). The COCI was developed to assess creative organizational climate in the Research & Development departments and we made small changes in statements to make it proper for the usage in school. It is composed of seven subscales as mentioned above on a 6-point scale ranging from

1 (absolutely right) to 7 (absolutely wrong). A .97 of Cronbach's α was reported for the total

scale, .82 to .95 for the seven subscales. A series of examinations of scale validation also

carried out, indicated a relevant relationship with criterion measures.

General self-efficacy (GSE) Scale

The GSE Scale (Schwarzer & Jerusalem, 1995) was used to assess perceived beliefs

about the ability to achieve goals and manage the environment (e.g., "When I am confronted

with a problem, I can find several solutions") (see Appendix). It consists of 10 items on a 4-

point Liket-type scale ranging from not at all true to exactly true. The Chinese version has

been translated and validated in China by Zhang and Schwarzer (1995). The GSE scale has

been used in numerous research projects where it typically yielded internal consistencies

between alpha = .75 and .91. The psychometric properties of this instrument were examined

among 19,120 participants from 25 countries and the results suggested that it is a

unidimensional and universal construct (Scholz et al., 2002). The internal consistency of this

scale and all other measures in the present sample are displayed in Table I.

Cultural Efficacy (CE) Scale

Cultural Efficacy Scale (Yi et al., 2008) was developed to assess perceived beliefs

about the ability of the people in some kind of culture to achieve goals and manage the

environment (e.g., "The people in this country have the resourcefulness to handle unforeseen

situations.") (Yi et al., 2008). Reliability analyses showed that the Cronbach's alpha was .89

for the 6 items of the formal vision of Cultural Efficacy Scale. The results of confirmatory

factor analysis (CFA) confirmed a single-factor model for it. In the present study only the data

of the cultural efficacy of own culture was collected.

Creativity Self-Efficacy (CSE) Scale

Creativity self-efficacy Scale (Yi et al., 2008) was planned to assess perceived beliefs

about the ability to produce novel and appropriate ideas, works, or productions (e.g., "I am

certain that I can produce novel and appropriate ideas.") (Yi et al., 2008). The Cronbach's

alpha was .83 for the 5 items of the formal vision of Creativity Self-Efficacy Scale.

Confirmatory factor analysis (CFA) also confirmed a single-factor model for it.

Results

The characteristics of the four variables

Table 1 displays the means, standard deviations, and score ranges of the predictor

variable, the hypothesized mediators, and the variable is to be predicted.

Table 1

Means, standard deviations (SD) and Cronbach's α for all scales (N =110)

	M	SD	Range	α
creative organizational climate	4.46	.78	2.5-5.9	.95
general self-efficacy	2.94	.54	1.7-4.0	.85
cultural efficacy of own culture	3.25	.66	1.7-4.0	.89
creativity self-efficacy	2.99	.62	1.4-4.0	.83

At first, an ANOVA was conducted to examine the gender, age, teaching subject,

school and teaching duration differences of teachers in creative organizational climate.

Gender was taken as the covariate variable. Very significant teaching duration differences

were found, $F(4, 86) = 3.92$, $p < .01$. It demonstrated that the longer the teaching duration,

the higher the creative organizational climate the teachers have. Concretely, the COCI scores

of the teachers who have 1 to 5 years teaching duration were 3.84, 4.42, 4.76, 4.45 and 4.97,

respectively. There were also significant age differences, $F(2, 86) = 3.83$, $p < .05$. The results

suggested that the COCI scores of teachers of different age were different. The teachers who

were born in the 1960s gained the highest COCI score (mean = 4.93), and the scores of the

teachers who were born in the 1980s were the lowest (mean = 4.41). The COCI scores of the

teachers born in the 1970s were in between (mean = 4.47). Moreover, the effect of two-way

school $\times$ teaching subject interaction was also found significant, F (2, 86) = 4.99, p < .05. The results suggested that the school differences of the COCI scores were affected by the different teaching subjects. In elementary school the teachers who teach foreign language gained the highest COCI scores (mean = 4.70), however, in secondary school the highest COCI score were obtained by science teachers (mean = 4.81). The science-teaching teachers' COCI scores in elementary school (mean = 4.42) were the lowest, and the Chinese-teaching teachers' COCI scores of secondary school (mean = 4.36) were the lowest. There were no gender, teaching subject, school or other significant interactions found. Because the main aim of the present study is not the COCI, the concrete seven dimensions need not be analyzed here.

Secondly, an ANOVA was conducted to examine the gender, age, teaching subject, school and teaching duration differences of teachers in general self-efficacy. Only gender difference was found, F (1, 106) = 7.58, p < .01. It showed that males (mean = 3.27) obtained significantly higher scores of general self-efficacy than females (mean = 2.88).

Thirdly, an ANOVA was conducted to examine the gender, age, teaching subject, school and teaching duration differences of teachers in cultural efficacy and creativity self-efficacy. No significant effect was found.

The relationships of the four variables

The correlation coefficients of the four variables are given in Table 2. The results demonstrated that the four variables have significant correlations. Path analysis was used to examine the relationships between the four variables. Figure 1 shows that the path coefficients from COC to CEO, GSE and CSE are .22 (p < .001), .16 (p < .05) and -.05 n.s., respectively. The path coefficients from GSE to CEO and CSE are .72 (p < .001) and .76 (p < .001), respectively and the coefficient from CEO to CSE is .25 (p < .001). So the results suggested that the direct effects of COC on GSE, CEO, and CSE are .16, .22, and -.05, respectively. And the indirect effects of COC on CEO and CSE are .12 and .21, respectively. The direct effects

of GSE on CEO and CSE are .72 and .76, respectively, the indirect effect of GSE on CSE is

.18 and the direct effect of CEO on CSE is .25. In general, about 83% variance of CSE can be

explained by the other three variables, $F (3, 108) = 79.94$, $p < .001$. About 38% variance of

CEO can be explained by the other two variables, $F (2, 108) = 51.64$, $p < .001$. Moreover,

about 23% variance of GSE can be explained by COC, $F (1, 108) = 5.82$, $p < .05$ (see Table
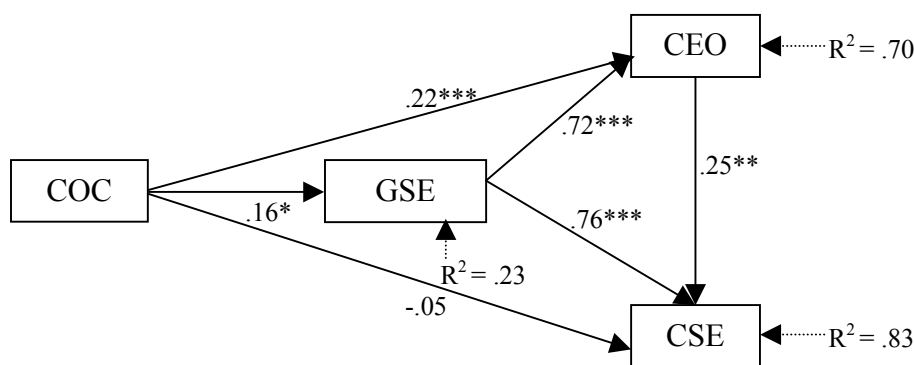
3).

Figure 1. Path analysis of the four variables

Note. * $p < .05$; ** $p < .01$ (two-tailed). The following is the same as well.

Table 2

Intercorrelations between climate and efficacy scores

	COC	GSE	CE
GSE	.23**		
CE	.40***	.65***	
CSE	.19*	.81***	.67***

Table 3

The effects of the variables in path analysis

Independent variable		GSE	CEO	CSE
COC	direct effect	.16	.22	-.05
	indirect effect		.12	.21
	total effect	.16	.34	.16
GSE	direct effect	-	.72	.76
	indirect effect	-	-	.18
	total effect	-	.72	.94
CEO	direct effect	-	-	.25
	indirect effect	-	-	-
	total effect	-	-	.25

Mediation model

Mediation is said to occur when an effect of a predictor on the outcome is explained by some intervening variable (Shrout & Bolger, 2002). Mediation requires that the predictor significantly affects the outcome as well as the mediator, that the mediator significantly affects the outcome, and that the effect of the predictor on the outcome vanishes (full mediation) or decreases (partial mediation) when the mediator is included (Baron & Kenny, 1986).

The Sobel test was applied to calculate the significance of each observed indirect effect of a predictor on an outcome through a mediator (Sobel, 1982).

In the mediation model, general self-efficacy continued to affect creativity self-efficacy directly, and cultural efficacy of own culture continued to affect creativity self-efficacy directly. However, results also imply the existence of indirect pathways from creative

organizational climate to creativity self-efficacy through general self-efficacy and cultural efficacy. Statistical significance of these indirect paths was supported by the Sobel test. $Z = 2.37$, $p < .05$ for the path from creative organizational climate to creativity self-efficacy through general self-efficacy; $Z = 3.99$, $p < .001$ for the path from creative organizational climate to creativity self-efficacy through cultural efficacy of own culture.

Discussion

The aim of the present study was to examine the characteristics of the creative organizational climate of Chinese schools, the general self-efficacy, creativity self-efficacy and cultural efficacy of the teachers in these schools and the analyses of the relations between the four core variables. First of all, we found the significant teaching duration differences on the perception of the creative organizational climate of school. It demonstrated that the longer the teaching duration, the higher the creative organizational climate the teachers have. So the perception of creative organizational climate is related to the professional level of the teachers. Those teachers who have more teaching experience and more communication chances seem to have more freedom to design their classroom, lessons, or teaching styles. Although it is impossible for a teacher to automatically become an expert from novice, each of them has the opportunity to grow in their professional field from novice to proficient, from proficient to expert teacher. Sternberg and Horvath (1995) developed a prototype view of expert teaching. They thought that the prototype expert is knowledgeable and is more effective than a novice. Moreover, experts are more likely to arrive at creative solutions to problems - solutions that are both novel and appropriate. Although the expert teachers do their jobs in the same work place like a novice, they have better perception of the organizational climate than the novice teachers.

Then we can easily understand the second difference, the age difference. The relatively older teachers who were born in 1960 or earlier are almost the expert teachers. The teachers who were born in the 1980s, have probably the least teaching experience, and most

of them were born under the one-child policy. It is probably the reason why their perception of creative organizational climate was the lowest. Jiao and her colleagues (Jiao, Ji & Jing, 1986) found that Chinese "only children" are more egocentric, whereas sibling children possess the positive qualities of persistence, cooperation, and peer prestige. And they also found that the occupation and educational background of parents and the number of generations living together are not decisive in determining the behavioral qualities of Chinese children in the Beijing area under study. So when the only children become teachers in school, they can be more egocentric and less cooperative than their colleagues of 1970s or 1960s, and this element can interact with the novices' teaching level. Therefore, they perceive a relatively lower creative organizational climate. Moreover, they have probably a higher and stricter standard about what is an ideal creative organizational climate than their colleagues of the 1960s or 1970s. Rosenberg and Jing (1996) thought that in China the impact of changing family structure on culture and values could be very deep. They gave an example that China has a history of strong cultural emphasis on the family, and usually it is the father who held the absolute authoritarian position in the family. However, after the one-child policy, traditional family structures and parental practices changed considerably. The child will have greater freedom and greater say, and the researchers thought that a more interactive parent-child relationship is potentially a precursor of a more democratic environment. So they probably need at work also a more democratic climate than their colleagues from 1960s and 1970s. As this greater value is placed on the individual, ultimately the culture will reflect this change. This point could be also the reason why teachers from the 1980s obtained the lower scores of COCI.

The significant effect of two-way school × teaching subject interaction suggested that probably the foreign language teachers of elementary school and the science teachers of secondary school have greater freedom to organize their works than other teachers in respective schools. On the contrary, the science teachers of elementary school and the Chinese

teachers of secondary school probably have the lesser freedom to do their teaching than other teachers in respective schools. The reason could be the characteristics of the subjects, teaching style, and interaction experiences. More study is needed to focus on the topic.

Gender difference was found in the general self-efficacy. The result confirmed the finding of Schwarzer and his colleagues (Schwarzer et al., 1997) that Chinese females had significantly lower scores of GSE than males. Research in child development and in sociology demonstrates that males have a greater sense of self-efficacy, personal control, and mastery than do females in American society (Gecas, 1989). Some previous reviews of the psychological (developmental) research on gender differences (Maccoby & Jacklin 1974, Block 1983) show that females have a more potent self-concept than do males, as well as that they score higher than males on aggression, activity level, and impulsivity. Girls indicate more evidence than boys of learned helplessness in achievement situations (Dweck et al., 1978). In computer self-efficacy Whitley (1997) found a dramatic age trend. In grammar school samples no gender difference was found. However, males revealed significant higher computer self-efficacy than females in high school participants. Block (1983) in her review of the psychological literature on gender differences in self-efficacy concludes:

> "The effect of cultural orientations on personality and behavior (with beliefs regarding personal control as one of the key elements) became a politically volatile issue in the "culture of poverty" controversy of the 1970s (see Gecas 1979 for a review of this literature and its relevance to social class and socialization concerns).
>
> The self-images of males, in contrast to those of females, include stronger feelings of being able to control (or to manipulate) the external world…Males describe themselves as more powerful, ambitious, energetic, and as perceiving themselves as having more control over external events than females…The self-descriptions of males, more than those of females, include concepts of agency…efficacy…, and

instrumentality-all reflections of a self-concept in which potency and mastery are important components. In contrast, females describe themselves as more generous, sensitive, nurturing, considerate, and concerned for others…The self-concepts of females emphasize interpersonal relations and communion…and do not emphasize competition and mastery." (p. 1339-1340)

However, extensive new evidence from meta-analyses of research on gender differences (e.g. Hyde, 2005) supports the gender similarities hypothesis that males and females are alike on most - but not all - psychological variables. In her review of 46 meta-analyses, Hyde found that some notable exceptions are some motor behaviors (e.g., throwing distance) and some aspects of sexuality. On these variables, the results showed large gender differences. Moreover, aggression shows a gender difference that is moderate in magnitude. The common explanations for these gender differences involve cultural factors (e.g. sex-role stereotypes), structural factors (e.g. the structure of social environments of two genders) or both. Gecas (1989) thought that sex-role socialization, therefore, also implies socialization into different conceptions of self-efficacy for boys and girls. This is reflected in the toys and games boys and girls play, with their differential opportunities for the development to efficacy (Block, 1983). Hyde (2005) claimed that gender differences can vary substantially in magnitude at different ages and depend on the context in which measurement occurs.

In traditional Chinese society, there were big differences between men and women. Women were more dependent and had less opportunity to have their own choice. Generally, the Chinese culture is traditionally patriarchal, with Confucianism being the protocol for proper family life *jia* for many centuries (Chan and Lee, 1995; Tang, 1999). The ethical norms of Confucianism prescribe a patriarchal, patrilineal, and patrilocal family system, and have rooted Chinese women into their inferior, dependent, and submissive roles which they play throughout their lives. The Confucius decorum of *san cong si de* (three obediences and four virtues) and *xian qi liang mu* (a virtuous wife and a good mother) forms the basis of

model womanhood. Respectable women should be obedient to their fathers when young, to their husbands when married, and to their sons when widowed; and should possess the four virtues of fidelity, tidiness, propriety in speech, and commitment to needlework. A good woman in traditional Chinese society is one who performs the role of a virtuous wife and good mother well. Although there was modernization in the last decades in China, especially under big western influence in the twentieth century, the traditional cultural values still play a roll in the socialization of Chinese girls and boys.

There were no other differences in GSE, CEO and GSE found in the present study. It confirms the findings of another study (Yi et al., 2008).

The path analysis indicates the significant positive correlations between the creative organizational climate of schools, the general self-efficacy, the cultural efficacy of own culture, and the creativity self-efficacy of teachers. Specially, there was only an indirect effect from COC to CSE through GSE and CEO, and no direct path effect. Somewhat different from the cross-cultural study of self-efficacy (Yi et al., 2008), there was also a significant effect from CEO to CSE found in the present study. The greater the creative organizational climate of the schools, the higher the level of the general and creativity self-efficacy and cultural-efficacy of own culture. And the higher the general self-efficacy, the higher the cultural efficacy of own culture and creativity self-efficacy. Furthermore, the results also confirmed the thought of Bandura (1986) that, collective efficacy is rooted in self-efficacy. It seems that creativity self-efficacy was also rooted in general self-efficacy. The results demonstrated the possible impact of creative organizational climate on the variables of efficacy in the Chinese schools. Of course, the causality cannot be assumed per se from this study as these specific measures were obtained at the same point in time. A stronger evidence of causality would be needed.

About the relations between the occupations and worker's self-efficacy, Melvin Kohn

and his colleagues (1969, 1973, 1976, 1983) have done the most prominent work. He focused on conditions of work that enable or inhibit self-direction in some of his studies. He has found these occupational conditions to significantly impact the value of self-direction, degree of intellectual flexibility and several aspects of personality similar to self-efficacy. Generally, he has found that the greater the freedom experienced on the job and the more complex and challenging the work, the more likely the workers to value individual freedom and self-direction, to be intellectually more flexible, and to have higher level of self-efficacy. These findings seem to confirm the present study.

In his studies, Kohn and his colleagues also found the significant relationships between "sense of powerlessness" and occupational self-direction (r = -.21), which is higher than between "ownership and hierarchical status in the company and occupational self-direction (r = -.13)". They claimed that "In all cases, job affects man more than man affects job" (cited from Gecas, 1989):

> "…a variable called "self-directedness," which at first glance seems relevant to self-efficacy, but in fact is a conglomerate of various "good" attributes. Kohn and Schooler define it as follows: "Self-directedness is reflected in not having authoritarian conservative beliefs, in having personally responsible standards of morality, in being trustful of others, in not being self-deprecatory, in not being conformist in one's ideas, and in not being fatalistic"…"

Other scholars have also found that the work autonomy, flexibility, and complexity are conducive to the development of workers' self-efficacy (Gecas, 1989). The results of the present study could be used for the development of intervention programs that increase the likelihood of personal effectiveness of teachers such as general or creativity self-efficacy, or collective efficacy such as cultural efficacy of own culture in school. Results suggest that interventions should promote the creative organizational climate of the school, and in order to

increase teachers' self-efficacy, cultural efficacy and creativity self-efficacy. Strategies for enhancing the creative organizational climate of school could be based on the knowledge about the seven dimensions of COC (Chiou, 2006), that is, organizational idea, working style, resource availability, teamwork operation, leadership efficacy, learning and progress, and environmental atmosphere. Or more concretely, the strategies should be based on the four sources of self-efficacy (Bandura, 1997), that is, mastery experiences, vicarious experiences provided by social models, social persuasion, and reduction of people's emotional arousal (in particular anxiety).

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General Discussion

In this chapter, the main results and conclusions related to the objectives introduced in the first chapter will be summarized. The related findings from all of the four chapters (Chapter 2 to Chapter 5) will be generally discussed. It will be divided into 9 parts, that is, summary of all results, methodological implications and new measurements, confirmed and not confirmed hypotheses and the explanations, theoretical Implications – CPMC, gender difference, broader discussion on creativity and its cultural/organizational influences, broader discussion on efficacy and its cultural/organizational influences, open questions and implications for educational practice, creativity and efficacy promotion

Summary of all results

In Chapter 2, the study suggested that German participants (Caucasian-Germans and Asian-Germans) produced more creative and aesthetically pleasing artworks than did their Chinese counterparts (Chinese studying abroad and domestic Chinese), and this difference in performance was recognized by both German and Chinese judges. However, there were no significant differences in artistic creativity performance, not only between Asian-German and German, but also between Chinese studying abroad and domestic Chinese. Thus the difference in creativity between German and Chinese students was not related to ethnic background but to cultural novel and appropriate issues. Moreover, the results also demonstrated that there was significant difference between German judges, Chinese judges studying abroad, and domestic Chinese judges. These differences were not associated with a preference of artwork from their own cultural background to that from other cultural background. However, in general, the consensus among Chinese judges regarding what constitutes creativity was similar among German judges.

In Chapter 3, the results demonstrated that the psychometric properties of the two new homogeneous and unidimensional scales (Creativity Self-Efficacy Scale and Cultural Efficacy

Scale) were satisfactory. There were no cultural, bicultural, and bilingual differences in general self-efficacy, creativity self-efficacy and cultural efficacy of own culture between German and Chinese participants. The study showed significant differences in cultural efficacy among Caucasian-German, Asian-German, Chinese studying abroad and domestic Chinese. Path analysis confirmed that there were significant path relationships from general self-efficacy to cultural efficacy of own culture and creativity self-efficacy. Cultural efficacy was found a mediator of general self-efficacy and creativity self-efficacy.

In Chapter 4, the results demonstrated that the psychometric properties of the Beijing Test of Creative Thinking (BTCT) were satisfactory. The BTCT consisted of two subtests – Verbal subtest and Figural subtest - and each subtest has one item. Regarding the developmental trend of creativity scores of children, it was found that the creativity scores of children in elementary school were significant higher than those of children in secondary school. For the children, the scores of the creative organizational climate of the elementary school were significantly higher than those of the secondary school. When the two variables were analyzed together, both the creative organizational climate of school and the creative thinking development of children were decreasing during the children's development. Moreover, the creativity and climate scores have a significantly high correlation, and the results from path analysis suggest that creative organizational climate of school has significant impact on all of the seven dimensions of the BTCT.

In Chapter 5, the results demonstrated that there were significant teaching duration differences, age differences and significant two-way school × teaching subject interaction in creative organizational climate and significant gender difference in general self-efficacy. A Path analysis indicated that the significant path coefficients ranged from creative organizational climate to cultural efficacy of own culture, general self-efficacy from general self-efficacy to cultural efficacy of own culture and creativity self-efficacy, and from cultural

efficacy of own culture to creativity self-efficacy. There was only an indirect pathway from creative organizational climate to creativity self-efficacy.

Methodological implications and new measurements

The Consensual Assessment Technique (CAT) (Amabile, 1982, 1996; Niu and Sternberg, 2001, 2003), which was used in Chapter 2, was testified to be a proper technique used for the studying about artistic creativity and its cultural influence. The Creative Organizational Climate Inventory is a useful measurement to know about the quality of some kind of domain specific climate in any kind of organization. In the future it is also necessary to get longitudinal data for the study of the causal relationship between organizational climate and concrete behavior of the members in the organization.

The results of Chapter 4 demonstrated that the psychometric properties of the Beijing Test of Creative Thinking (BTCT) were satisfactory. Reliability and validity suggested that the test can be seen as a proper instrument for the present study.

In Chapter 3, it was also found that the psychometric properties of the two new efficacy scales, the Creativity Self-Efficacy Scale and Cultural Efficacy Scale were satisfactory. Reliability, item-total correlations, and factor loadings suggested that both of the scales can be seen as homogeneous and unidimensional.

Self-efficacy is commonly understood as domain-specific and creativity self-efficacy is some kind of the self-belief one has in the "domain" of creativity. The results in present study are that creativity self-efficacy seems to support the findings of Tierney and Farmer (2002). They have developed the scale with the same name and they subsequently reduced the item pool three times from 46, 13, to 3, respectively. With the EQS they also found the single-factor model has the best fit results. But the change of the item pool was so big that it was probably hard to obtain the proper items. However, their scale was especially for the worker in firms (manufacturing or operations). The situation can be different from the scale in present

research, which is for the general people. Moreover, the findings in present study also seem to support the hypothesis in Beghetto's study (2006) that Creative Self-Efficacy Scale can be seen as homogeneous and unidimensional. But there was no more analysis of factor loadings, validity etc. in that study.

Cultural efficacy was also found as homogeneous and unidimensional. It can be understood as one kind of collective efficacy which was defined and discussed by Bandura (1986, 1997). He did not talk about the dimensions of the collective efficacy but he thought that from different sources such as groups, organizations, or nations people can partly get the sense of collective efficacy, conquer difficulties and improve their living standard through concerted effort. The cultural efficacy in present study is one kind of collective efficacy of the national or much bigger level. When we use it to assess people's perceived beliefs about the capability of the people in their own culture to achieve goals and manage the environment, the efficacy then is self perception through one's own culture. When we use it to assess people's perceived beliefs about the capability of the people in the other cultures, the efficacy then references to stereotypes, attitudes or impressions of other cultures. Some scales like Cultural Self-Efficacy Scale (Bernal & Froman, 1987), or Eldercare Cultural Self-Efficacy Scale (Shellman, 2006) were also developed, however, they were more about nursing or eldercaring, so they are different from the scale in the present study.

Confirmed and not confirmed hypotheses and the explanations

Creativity and culture/organizational climate

First of all, the methods used in the four empirical studies can not draw causal conclusions which need be based on longitudinal samplings or experimental designs. So the conclusions that we made in the present dissertation were correlative. It can be seen as a start point to construct studies to testify the possible causal relationships between the variables.

The results of Chapter 2 demonstrated that the artistic creativity of German students is significantly higher than that of Chinese students. It confirmed the hypothesis that German

artworks would be evaluated as more creative than Chinese artworks. The findings show that culture probably can directly influence people's artistic creativity. There is a strong tendency for people in different cultures to express their artistic creativity in different ways. The results suggested that the creativity of German artworks was probably due to the higher artistic ability of German participants compared with Chinese participants. The possible reason of individualism-collectivism culture and the social system will be discussed in the following.

The second hypothesis of Chapter 2 was that those who have bicultural or bilingual experiences were more creative than those who have only one cultural experience. Specifically, in the respective culture, we supposed that Asian-German artworks would be more creative than Caucasian-German artworks; Artworks of Chinese studying abroad would be more creative than domestic Chinese artworks. The results did not confirm the hypothesis. There is no difference in artistic creativity not only between Asian-Germans and Caucasian-Germans, but also between Chinese studying abroad and domestic Chinese. Probably the extent of the individual's immersing themselves in foreign cultures is the other meaningful reason.

Chapter 2 showed that there were significant differences between German judges, Chinese judges studying abroad, and domestic Chinese judges. But as we mentioned above, the difference did not mean that judges favour the artwork from their own cultural background over that from other cultural backgrounds. In fact, not only German judges, but also Chinese judges studying abroad and domestic Chinese judges rated German artworks as more creative than Chinese artworks. The results did not confirm the third hypothesis that there would be an interaction in judging among the groups of judges and the nationality of the artwork. Particularly, people would judge artworks from their own culture to be more creative, and they would also judge the likeability of artworks from their own culture as superior to artworks from other cultures. The results of our study of artistic evaluation seem to support the results of Haritos-Fatouros and Chid (1977), Niu and Sternberg (2001, 2003). In

their studies, people in different cultures adopted similar criteria to judge an artwork. This result was different from the study of Binnie-Dawson and Choi (1982), in which people preferred artworks from their own culture. Although our intention was not to study people's concepts of creativity, this specific result seems to reveal that people in different cultures may have a similar understanding of artistic creativity.

The difference between the rating criteria used by those three groups of judges was that Chinese judges studying abroad and domestic Chinese judges tended to give higher grades on average to all products than did German judges. We attributed this difference to German judges applying a higher standard to judge artworks due to the apparently higher artistic ability of Germans compared to Chinese. As mentioned above, due to the pressure of the National College Entrance Exam (NCEE), Chinese students live through the drill of preparing for various exams (Niu, 2007). The macro- and micro environment can not leave the free place for children to learn art such as drawing, because it is not the main part of NCEE.

The personal experience of the author of present dissertation is that there are very few resources or materials of the art classes available for children to take or use from elementary to secondary school. If one Chinese child has high artistic potential, he can hardly get the basic training and supervising from the normal school system, and he has to take special course at his leisure. So a typical phenomenon in China is that on weekends or after school children are brought from one interest class to another interest class. But the feeling or intrinsic motivation of children is quite low to be concerned. Therefore, Chinese children can hardly get the necessary artistic training in their school time.

In Germany the situation is probably better than in China. The artistic potential of children is protected and respected and can get better training in the normal school time. Of course, there is no national level NCEE in Germany as well, so the students need not as much

time as Chinese students to prepare for the examinations and they can develop their own

interests freely. At the same time, the teachers can also have more place to organize their

classes and teaching. So generally the German students probably have more artistic

experiences and higher artistic standards. Although we can see in Chapter 4 that the creativity

development of children is not always increasing, but whether the creativity potential of the

child is protected and respected or not is probably one of key elements for them to express

creativity in the future. If we connect the findings of Chapter 4 with the situation in Germany,

it seems that the creative organizational climate in German schools is proper for the creativity

development of children. The quality of climate can probably not decrease during the

children's growing. And then children will keep a kind of developed or unhurt creativity to be

an adult and express the creativity when they need to.

Moreover, we didn't find the similar results of the reliability scores that Chinese

judges were more in agreement in judging artworks than were American judges. Niu and

Sternberg (2001) found that the reliability scores of the Chinese judges were uniformly higher

than those of the American judges. Their result suggested that Chinese judges in general may

have more consensus in their notion of what is creative than do American judges (Niu &

Sternberg, 2001). Actually, German judges were almost the same in agreement in judging as

Chinese judges, and there was no significant difference. This point probably suggested that

the standard in judging of artistic creativity used by Germans was also different from the

American, although both of them have a stricter standard than Chinese in judging of artworks.

So probably the difference of agreement among German, Chinese and American judges could

reflect American culture emphasizing individual differences more than German and Chinese

do.

In the Chapter 4 there were 5 hypotheses. The first one was about the new test of

creativity which has been discussed above. So the other four hypotheses will be discussed

here. Hypothesis 2 and 3 were that the creativity scores of children would increase from 10 to 16 years old and the creativity scores of children in secondary school would be significantly higher than those in elementary school. Actually they are similar. They results did not confirm the two hypotheses. The results suggested that the creativity scores of children do not increase from 10 to 16 years of age. There was no significant age difference. And the creativity scores of children in elementary school were significantly higher than those of children in secondary school. The dramatic results were probably due to the different creative organizational climate in the elementary school and the secondary school. So the variable of climate was assessed in the study.

The fourth hypothesis was confirmed in the Chapter 4 that the creative organizational climate scores of the teachers born in 1980s would be significantly lower than those of the teachers born in 1970s and 1960s. . The teachers who were born in the 1980s, have probably the least teaching experience, and most of them were born under the one-child policy. It is probably the reason why their perception of creative organizational climate was the lowest. Jiao and her colleagues (Jiao, Ji & Jing, 1986) found that Chinese "only children" are more egocentric, whereas sibling children possess the positive qualities of persistence, cooperation, and peer prestige. And they also found that the occupation and educational background of parents and the number of generations living together are not decisive in determining the behavioral qualities of Chinese children in the Beijing area under study. So when the only children become teachers in school, they can be more egocentric and less cooperative than their colleagues of 1970s or 1960s, and this element can interact with the novices' teaching level. Therefore, they perceive a relatively lower creative organizational climate. Moreover, they have probably a higher and stricter standard about what is an ideal creative organizational climate than their colleagues of the 1960s or 1970s.

We predicted in the Chapter 4 that the creativity and climate scores would have a significantly high correlation and the school climate variable would have significant

influences on creativity of children. The results confirmed it. The explanations will be
discussed in the following.

Efficacy and culture/organizational climate

11 hypotheses were made in the Chapter 3. The first one was about the development
of new measurements which have discussed above. There were no cultural, bicultural, and
bilingual differences in general or creativity self-efficacy between German and Chinese
participants, so the hypothesis 2 to 7 was not confirmed. The results also did not testify the
findings of the previous studies (e.g. Schwarzer et al, 1997) that Chinese perceived lower
general self-efficacy than their German counterparts and self-efficacy might be rated lower in
collectivistic cultures than individualistic. It was probably due to the cultural development in
Chinese society.

The other four hypotheses of the Chapter 3 were almost confirmed.

Hypothesis 8 was confirmed that the cultual efficacy (of German, of Chinese, and of
American culture) of Chinese participants would be higher than that of the Germans, so
Chinese participants reveal more optimistic than their German counterpart not only about own
culture, but also about other cultures.

Hypothesis 9 was also confirmed that in German participants, the cultural efficacy (of
German, of Chinese, and of American culture) of Asian-Germans would be higher than that of
Germans, so Asian-Germans feel more optimistic than their Caucasian-German about the
three cultures.

Hypothesis 10 was confirmed that in Chinese participants, the cultural efficacy (of
German, of Chinese, and of American culture) of domestic Chinese would be higher than
those of Chinese studying abroad, so domestic Chinese showed more optimistic than their
counterpart Chinese studying abroad about the three cultures.

Hypothesis 11 was also confirmed that there would be significant correlations among general self-efficacy, creativity self-efficacy and cultural efficacy, furthermore, cultural efficacy would moderate the effect of general self-efficacy on creativity self-efficacy.

In the Chapter 5 we did not make special hypothesis. But we found that the significant path coefficients ranged from creative organizational climate to cultural efficacy of own culture, general self-efficacy from general self-efficacy to cultural efficacy of own culture and creativity self-efficacy, and from cultural efficacy of own culture to creativity self-efficacy. There was only an indirect pathway from creative organizational climate to creativity self-efficacy.

Theoretical Implications – CPMC

In the Chapter 1 the new model of creativity-Cultural Pyramid Model of Creativity (CPMC) was introduced. Some discussions related to CPMC were made above. Generally, there are the significant impacts from cultural influence to artistic creativity, cultural efficacy, also from environmental climate to creativity development, general self-efficacy, creativity self-efficacy and cultural efficacy (see Chapter 2 – Chapter 5). Obviously it is impossible to testify the whole model in one dissertation. However, the findings demonstrated that it is meaningful to construct such a model and further to conduct more studies about the relationships between creativity and mind, spirit, body, three layers of cultures etc.

Gender difference

In Chapter 2 and Chapter 4, there is no gender difference not only on artistic creativity of university students but also on general creativity of elementary and secondary school students. They found British female's scientific creativity was evidently superior to males'. But Chinese male's scientific creativity was superior to females', and the difference was not remarkable. Zhou and his colleagues (Zhou, Zha & Shi, 1995) also found the gender differences that both Chinese and German females obtained higher scores than males, only Chinese super gifted males gained higher scores than females.

Kaufman and his colleagues (2004) used the Consensual Assessment Technique, in which experts judge a product's creativity, to examine differences in creativity among gender and ethnic groups. They conducted three separate analyses in which 13 experts rated 103 poems, 104 fictional stories, and 103 personal narratives written by Caucasian, African American, Latino/a, and Asian eighth-grade students. There were also no gender differences on all three tasks, like the findings in Chapter 2 and Chapter 4. More studies about gender differences on creativity are needed to conduct in the future.

Concerning the general self-efficacy, gender difference was found in Chapter 5 but not in Chapter 3. The result in Chapter 5 confirmed the finding of Schwarzer and his colleagues (Schwarzer et al, 1997) that, Chinese females were found significantly lower GSE than males. Previous research (Schwarzer, 1993; Schwarzer et al., 1997) found that in one of the samples of German university students, men had higher self-efficacy than women, and the Chinese females had significantly lower general self-efficacy than males. However, in present study, there was no gender difference. Just as Schwarzer (1993) said that in most of the previous German samples under study there were no gender differences. And it is important to examine whether the construct of general self-efficacy favours men, or if there is a "male bias" in the scale, and why gender differences can be found in some studies and in others not.

Research in child development and in sociology demonstrates that males have a greater sense of self-efficacy, personal control, and mastery than do females in American society (Gecas, 1989). Some previous reviews of the psychological (developmental) research on gender differences (Maccoby & Jacklin 1974, Block 1983) show that females have a more potent self-concept than do males, as well as that they score higher than males on aggression, activity level, and impulsivity. Girls indicate more evidence than boys of learned helplessness in achievement situations (Dweck et al., 1978). In computer self-efficacy Whitley (1997) found a dramatic age trend. In grammar school samples no gender difference was found. However, males revealed significant higher computer self-efficacy than females in high

school participants. Block (1983) in her review of the psychological literature on gender differences in self-efficacy concludes:

"The effect of cultural orientations on personality and behavior (with beliefs regarding personal control as one of the key elements) became a politically volatile issue in the "culture of poverty" controversy of the 1970s (see Gecas 1979 for a review of this literature and its relevance to social class and socialization concerns). The self-images of males, in contrast to those of females, include stronger feelings of being able to control (or to manipulate) the external world…Males describe themselves as more powerful, ambitious, energetic, and as perceiving themselves as having more control over external events than females…The self-descriptions of males, more than those of females, include concepts of agency…efficacy…, and instrumentality-all reflections of a self-concept in which potency and mastery are important components. In contrast, females describe themselves as more generous, sensitive, nurturing, considerate, and concerned for others…The self-concepts of females emphasize interpersonal relations and communion…and do not emphasize competition and mastery." (p. 1339-1340)

However, extensive new evidence from meta-analyses of research on gender differences (e.g. Hyde, 2005) supports the gender similarities hypothesis that males and females are alike on most - but not all - psychological variables. In her review of 46 meta-analyses, Hyde found that some notable exceptions are some motor behaviors (e.g., throwing distance) and some aspects of sexuality. On these variables, the results showed large gender differences. Moreover, aggression shows a gender difference that is moderate in magnitude. The common explanations for these gender differences involve cultural factors (e.g. sex-role stereotypes), structural factors (e.g. the structure of social environments of two genders) or both. Gecas (1989) thought that sex-role socialization, therefore, also implies socialization into different conceptions of self-efficacy for boys and girls. This is reflected in the toys and

games boys and girls play, with their differential opportunities for the development to efficacy (Block, 1983). Hyde (2005) claimed that gender differences can vary substantially in magnitude at different ages and depend on the context in which measurement occurs.

In traditional Chinese society, there were big differences between men and women. Women were more dependent and had less opportunity to have their own choice. Generally, the Chinese culture is traditionally patriarchal, with Confucianism being the protocol for proper family life *jia* for many centuries (Chan and Lee, 1995; Tang, 1999). The ethical norms of Confucianism prescribe a patriarchal, patrilineal, and patrilocal family system, and have rooted Chinese women into their inferior, dependent, and submissive roles which they play throughout their lives. The Confucius decorum of *san cong si de* (three obediences and four virtues) and *xian qi liang mu* (a virtuous wife and a good mother) forms the basis of model womanhood. Respectable women should be obedient to their fathers when young, to their husbands when married, and to their sons when widowed; and should possess the four virtues of fidelity, tidiness, propriety in speech, and commitment to needlework. A good woman in traditional Chinese society is one who performs the role of a virtuous wife and good mother well. Although there was modernization in the last decades in China, especially under big western influence in the twentieth century, the traditional cultural values still play a roll in the socialization of Chinese girls and boys.

Broader discussion on creativity and its cultural/organizational influences

Why revealed German students superior to Chinese students on all of the eight dimensions of the artistic task? According to the Cultural Pyramid Model of Creativity (CPMC) (see Chapter 1) and the studies of the Chapter 2 and 4, the influences of the big cultural environment and the school should be concerned. School is supposed in CPMC as one layer of the relationships, because everyday the individual has many interactions with others and they have a relative stable relationship. In school students have interactions with teachers, other students and the settings of school, so they are exposed to systematic influence

from school. The relation between creative organizational climate of school and creativity

development of students was studied in Chapter 4. Although it is not about the comparison

between German and Chinese schools and also not about artistic creativity, we can also find

the possible mechanism of creativity development of students and its influence. Children's

creativity was found not to be developing, but also to be decreasing at some age. This kind of

decrease is due to not only the nature of creativity development itself but the influence of

environment. The better the creative organizational climate of school, the higher level of

creativity expression the students.

If we look at the data of Chinese students of elementary, secondary schools and

university as a continued data, we could propose that generally the creativity of younger

children decreases during their growing up. More and more knowledge learning could not

make them more creative. According to Niu's review (2007) about the history of the Chinese

traditional educational testing system and its western influence in the twentieth century, we

can feel the tension between Chinese tradition and modern and the effect of modern western

influence. In the review, she focused on two historical periods, from 1905 to 1949 and post-

1980, when western influences were most vigorous. She concluded that under the influence of

various western nations, the structure of Chinese education was fundamentally altered from a

focus upon Confucian classics to the inclusion of modern western subject areas, and more

recently, a move from knowledge-based tests to aptitude measurements. The reality in present

China throughout general policy is that western inspired reforms have impacted upon the

everyday lives of Chinese students. In the shadow of the traditional educational testing

systems, students lived through the drill of preparing for various exams, all of which

culminated in the National College Entrance Exam (NCEE). The ability to combat exam-

related anxieties, and the endurance developed over years of exam-preparation may help

Chinese students excel in exams in comparison with their western counterparts. However, like

Niu said that an exam-driven knowledge-based education may result in a sacrifice of

independent intellectual inquiry and creative thinking (Niu & Sternberg, 2001, 2003; Niu, 2007). Such testing systems also promote homogeneity and may diminish students' motivation to pursue their own interests rather than exam-related academic work.

Although the college and secondary school students have more knowledge than elementary students, their divergent thinking, free spirit and creativity probably is damaged or misused during the process of studying and the drill of preparing for various exams. The Chinese participants in Chapter 2 were those who have passed numerous exams. Although some of them had chances to study abroad or study at the top-class Chinese universities, it is very hard to improve their creative expression to better level than their German counterparts. Probably the damaged independent intellectual inquiry and creative thinking is difficult to rehabilitate in short time.

From this view, the interactions between the three layers of CPMC are also obvious. The collective layer is the general cultural influence, just like the Chinese traditional testing system or Western standard testing system. During the history development and after all kinds of educational reforms the Chinese educational and testing policies improved, however, there are also many systematic elements such as exam-centred and knowledge-based testing system (collective layer), which can impact the educational climate in school (relationship layer) which can determine the students' everyday activities of learning and playing (individual layer). They can probably inhibit the creativity development of students. Such kind of public opinion is also accepted by children, their parents and teachers (individual layer). They provide the other kind of organizational climate, such as family climate. (relationship layer). The whole system (collective layer) receives the proper soil to survive and will be more and more elaborate and the effect of western influence and test-oriented system is only one side of the reason, on the other side, the public administration of educational system come also under more and more criticism. Qian (2008) generalized that almost all of the Chinese universities

lose their ways and they are pushed only by pragmatism and nihilism. He found that Chinese students study only for obtaining employment after graduation, and the learning in elementary and secondary school is exam-oriented. He thought that "everything for exam, everything for employment" is the Chinese contemporary educational logic. He concluded that the high centralization of state power in the Chinese educational system should take the responsibility for the bad educational quality. The government should not control everything in hand and should not make uniform regulations such as the concrete content of music and PE class in elementary and secondary schools. This kind of administrational situation seems to also inhibit the creativity development of students and teachers' creative expression of teaching through interfering with the autonomous right of schools and universities.

There is some experience of the German educational system which can probably be shared with China. In PISA 2006 (Programme for International Student Assessment), which focused on scientific literacy, German 15-year-old children rated higher in performance (mean = 516, place 13th in 57 countries and regions) than PISA 2003 (mean = 502, place 18th in 40 countries and regions). There are many new educational or scientific policies in Germany especially after the PISA 2000 or 2003 (Brandt et al. 2007).

Of course, not only for Chinese but also for German students as well there are still many things to be done to promote the creativity of children in both of the countries. For example, in PISA 2006 the science performances of Hongkong Chinese (mean = 542, place 2nd in 57 countries and regions) and Taiwan Chinese (mean = 532, place 4th in 57 countries and regions) were relatively high in all of the participating countries and regions. It demonstrates that Chinese children have good potential to be creative. The environmental or school climate must develop a proper situation to protect and promote the children's creativity. It also shows that Germans and Chinese can learn from each other on some points.

The next question is whether bicultural or multicultural experience enhances creativity or not. If yes, how does it happen? If not, which variables may possibly impact the process? Chapter 2 showed that there was no difference between the performance of Chinese studying abroad and domestic Chinese. It seems to demonstrate that those who have bicultural experiences are probably not more creative than those who have only one cultural experience. Moreover, there was also no difference between the performance of Asian-German and domestic German. The results do not seem to support the claim of Lubart (1999) that there are significant positive correlations between bilingualism, bi-culture and creativity. Of course, the artistic creativity in present study somewhat differs from the creativity thinking measured by TTCT or other general creativity tests.

Comparing with another similar study between Americans and Chinese, American participants obtained also significantly higher scores than Chinese counterparts (Niu & Sternberg, 2001, 2003). And in their studies Caucasian-American and Asian-American participants were more creative than Chinese, and there was also no difference between the former two groups. The two studies can also confirm each other. Obviously, from the results of the two studies there were no ethnic factors which can impact the expression of creativity. The Asian-Germans had a similar ethnic background like the Chinese studying abroad and the domestic Chinese, but between the two groups there were significant differences. It suggested that a generally independent-oriented society was probably better for the expression of artistic creativity than interdependent-oriented society. Although there are also differences between the American and the German culture, we can suppose that the common grounds shared by them are more than that shared by Americans and Chinese, or by Germans and Chinese.

The cross-cultural study conducted by Shen and Lin (2007) found that in some dimensions of scientific creativity Chinese participants were better than the Japanese or British counterparts. But why can they not become even better during the process of growing

up? Probably some Chinese people are also creative when they are very young, but during more and more interaction with some aspects of social culture, they turn to be not so creative, they become more and more scrupulous. On the contrary, some children from other cultures are not so creative when they are very young. But during the interaction with self-oriented social culture, they can become more and more creative. Just like the explanations with CPMC mentioned above.

A study about cultural experience and creativity by Angela Ka-yee Leung and her colleagues (2008) showed that multicultural experience increases creative performance and the use of some creativity-supporting cognitive processes. They found that the connection between multicultural experience and creativity is impacted significantly by how deeply individuals have had the experience of immersing themselves in foreign countries. The findings also demonstrated that individuals will benefit more from multicultural experience when they adapt and open themselves to foreign cultures and actively think about and compare the differences they encounter between their home culture and the foreign culture. When the individuals get the questions with firm answers or adherence to conventional knowledge, the relationship between multicultural experience and creativity was found to become weaker. In Chapter 2 the concrete information about participants' extensiveness of interactions with foreign cultures was not genuinely checked in sampling. However, the Chinese studying abroad are often hold themselves a group with international, cross-cultural perspective and higher creativity than domestic Chinese who have no experience studying abroad. Most domestic Chinese people agree with this. But when they do not have sufficient time living abroad and have only few interactions with foreign cultures, it is hard to promote their creativity and other abilities.

From 1872 till now, the policy to send students to study abroad has always been an important part of Chinese national strategy of modernization (Yung, 1909; The China

Scholarship Council (CSC), 2007). In 1872 in Qing dynasty there were 30 students with an age range from 12 to 15 years, who were selected as the first group in Chinese history to study abroad in America and financed by the government. 135 years later, in 2007 there was a new program and 3,952 students were selected and financed by the government to study abroad. However, most of them were graduate students, some were doctoral students, scarcely any of them is under 18 years old, and they have one to four years to study abroad, after which they will go back to China. Moreover, the foreign language ability of many of them is also not sufficient. Based on the findings in such kind of study, if we suppose that studying abroad can accelerate creativity, it is probably not good for their creativity development when they go to study abroad too late and go back too quickly. The process of the cultural impact and the perception of the impact possibly need longer time and more preparation. When the students abroad have too short time and too few communicational tools available for use to experience the other culture, this experience may not be so helpful for the expression and promotion of their creativity.

Actually the aim of an ideal creative organizational climate is also to create more multi experiences and let teachers get more interactions with other teachers or gain more creative ideas during self-exploring. The dimensions of the Creative Organizational Climate Inventory (COCI) consisted of organizational ideas, working style, resource availability, teamwork operation, leadership efficacy, learning and progress, and environmental atmosphere. All of the seven dimensions focus on the autonomy, freedom, enough resources available for use, and the interactions with professionals, colleagues, leaders, and parents etc. So, the more the multi experiences, the better the creative organizational climate.

Broader discussion on efficacy and its cultural/organizational influences

Somewhat surprisingly, the finding of the cross-cultural study does not seem to support claims in many other studies (e.g., Schwarzer et al, 1997; Scholz et al, 2002) that

Chinese perceived lower general self-efficacy than their German counterparts and self-efficacy might be rated lower in collectivistic cultures than individualistic. Of course, the Chinese data base in both studies cited above was from Hong Kong. Hong Kong Chinese were probably not representative for Chinese students or even for the Chinese population (Schwarzer et al, 1997). In Klassen's review (2004), the efficacy beliefs of Asians, immigrant Asian groups, and Western (i.e. Western European, European American, or Canadian) were compared. Actually, in the 16 studies cited in this part of the review there were only 3 of them taking the samples from mainland China (People's Republic of China), and the other "Chinese" samples were Hong Kong Chinese or Taiwan Chinese, which were somewhat different from the mainland Chinese. Although they are different, their common sharing aspects are in all probability more than their differences.

Mau (2000) examined the relations between decision-making self-efficacy and decision-making styles (rational, dependent, and intuitive) of Taiwanese and American (largely Caucasian) college students, attributed the lower efficacy beliefs of the Taiwanese students to "the collective-oriented culture (that) may have influenced Taiwanese students to rely less on individual abilities than on group efforts" (p. 374). Mau's study found that although a majority of American and Taiwanese students endorsed a rational style of decision-making (e.g., "I am very systematic when I go about making an important decision"), the Taiwanese chose a dependent style ("When I make a decision it is important to me what my friends think about it") as the second most likely choice, while the Americans were significantly less likely to endorse a dependent style.

Although self-efficacy is not the standard to distinguish individualistic or collectivistic, but Mau (2000) suggested that it is the cultural dimensions of individualism and collectivism that differentially influence the development of self-efficacy belief: "The culture that is individual-oriented is more conductive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy".

If we concern the impact of climate on efficacy of Chapter 5, the changing of cultural type can probably explain why there are the general self-efficacy differences between previous Chinese and today's Chinese. It can be supposed that most of the Hong Kong and Taiwan Chinese previously had more western influence than mainland Chinese. They may be more individualistic and could have a higher level of self-efficacy than mainland Chinese. But the results suggested that it is not the reality. According to the results in present and previous studies, the general self-efficacy of Hong Kong or Taiwan Chinese could be even lower than for the mainland Chinese. Is it possible that individualistic and collectivistic as the two opposite characteristics coexist in one person? Probably the situations can influence people's self-efficacy in Hong Kong, Taiwan and mainland China which has changed in the last 10 years.

Nisbett (2003) has cited some studies in his book. One of the studies found that the socialization of Chinese children was becoming more and more western. The researchers compared the expectation to their children of mothers in Beijing between 1980s and ten years later. They found that in 1980s mothers were more concerned about the ability to deal with diversified relations. And then years later their biggest interest was almost like western mothers as to whether their children have the survival ability and independency. Nisbett and his colleagues used a value ideas questionnaire to compare the value ideas between the students of Peking University and the students of Michigan University. They found that the students of Peking University think more about equality, imagination, independency, open mind and diversity of life than the counterpart from Michigan, however, the students of Michigan University think more about self-discipline, loyalty, even homage to tradition and respect to parents and father figures.

The other explanation is probably the one-child policy. Jiao and her colleagues (Jiao, Ji & Jing, 1986) found that only children are more egocentric, whereas sibling children possess the positive qualities of persistence, cooperation, and peer prestige. And they also

found that the occupation and educational background of parents and the number of generations living together are not decisive in determining the behavioral qualities of Chinese children in the Beijing area under study. Rosenberg and Jing (1996) thought that in China the impact of changing family structure on culture and values could be very deep. They gave an example that China has a history of strong cultural emphasis on the family, and usually it is the father who holds the absolute authoritarian position in the family. However, after the one-child policy, traditional family structure and parental practices changed considerably. The child will have greater freedom and greater "say", and the researchers thought that a more interactive parent-child relationship is potentially a precursor of a more democratic environment. So they need probably at work an also more democratic climate. As this greater value is placed on the individual, ultimately the culture will reflect this change. This point could be also the reason why Chinese in Chapter 3 obtained the same scores of general and creativity self-efficacy like their German counterpart.

The creativity self-efficacy showed high correlation with general self-efficacy (see Chapter 3 and Chapter 5) and there is also no difference between German and Chinese participants. There were no relative studies that can be found and compared with the finding in present study. It was supposed that creativity self-efficacy as one domain-specific level of self-efficacy also rooted in general self-efficacy. From the feedback of daily experience and general sense of self competence man can probably get the specific self-beliefs about own capability to produce novel and appropriate ideas, works, or productions.

However, at the same time Chinese have also a higher cultural efficacy than their German counterparts. The findings seem to partly support the hypotheses or conclusions of other researchers (e.g. Schwarzer et al, 1997; Earley, 1993, 1994) that Chinese are regarded as less individualistic and more collectivistic than Westerners, so they could have lower general self-efficacy and higher cultural efficacy than the western counterparts. Actually, not only on the dimension of cultural efficacy of own culture, but also on the dimension of cultural

efficacy of German or American culture, the Chinese in present study should have significantly higher scores than their German counterparts. So there are obviously cultural differences on cultural efficacy. Moreover, how about the bicultural or bilingualism differences?

Most of the Asian-Germans in present study speak at home the mother language of their parents or their grandparents while at the same time German is their mother language. So they are the only "pure" bilingual sample in the four groups. Chinese studying abroad have two cultural experiences, although the mean of the German cultural experience is only 20 months, so they are the bicultural sample of the four groups. From the results we can find that only on the dimension of cultural efficacy of German and American culture, the Asian-Germans showed lower scores than domestic Chinese and Chinese studying abroad, respectively. So the results suggested that there were weak bilingual differences found in present study. As to the Chinese studying abroad, only on the dimension of cultural efficacy of German culture they had lower scores than domestic Chinese. So there was probably a weak bicultural difference that was found in this study. Again, there was no gender difference found in present study.

Bandura (1995) stated that it would be interesting to compare the cross-cultural scores in future studies with corresponding levels of collective self-efficacy. We find in present study some results are really interesting. As we have seen in present study, Chinese participants showed significant higher cultural efficacy not only on the dimension of cultural efficacy of their own culture, but also on the dimensions of cultural efficacy of German or American culture. Mau (2000) suggested that it is the cultural dimensions of individualism and collectivism that differentially influence the development of self-efficacy beliefs: "The culture that is individual-oriented is more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy". Even in her explanation we can feel the low self-efficacy of own collective-oriented culture. The finding

in present study doesn't seem to support this kind of claim. Maybe we can change it as to the culture that is individual-oriented that may have inhibited the development of cultural efficacy, while the collective-oriented culture is more conducive to fostering cultural efficacy. This perspective probably can explain the results in present study.

The other difference is also interesting. As for the German participants, they have the highest cultural efficacy about Chinese culture and the lowest cultural efficacy about American culture. And for the Chinese participants, they have the highest cultural efficacy about American culture and the lowest cultural efficacy about German culture. Both of the two groups of participants have the medium level cultural efficacy about their own culture. Obviously, Chinese participants have better beliefs about American culture than about German or own culture and German participants seem to believe that Chinese culture is more perfect than American and own culture.

Open Questions

First of all, the CPMC is a model as hypothesis. Whether it reflects the reality or not, more and more studies are needed to check it. Moreover, there were cultural differences on creativity and efficacy, but the relation between creativity and self-efficacy or collective efficacy were not studied in present dissertation. If we follow the differences between the claim of Mau (2000) and the findings in Chapter 3, the relation between creativity and efficacy should be explored in the future.

Before that we should make clear, the relations between cultural dimension of individualism and collectivism and efficacy dimension of self-efficacy and collective efficacy. Because the finding in Chapter 2 is so different from the claim of Mau: "The culture that is individual-oriented is more conducive to fostering self-efficacy, while the collective-oriented culture may have inhibited the development of self-efficacy" (Mau, 2000). However, the finding in Chapter 3 showed that the culture that is individual-oriented may have inhibited the

development of cultural efficacy, while the collective-oriented culture is more conducive to fostering cultural efficacy. And there were also no cultural differences on self-efficacy.

In Chapter 4 the relationships between creative organizational climate of school and creativity development of students were explored. From the cross-cultural perspective it is also interesting to check the same relationships in another country or culture, such as in Germany. And if we consider the Chapter 2, it is also necessary to study the relationships in Chinese and German universities.

Implications for Educational Practice, Creativity and Efficacy Promotion

The findings in present dissertation bring us some meaningful implications. Creativity promotion is an important issue both in Germany and in China. The macro cultural influence is very important, because it works on people's value ideas. A relatively individual culture is better than collective culture for the development of creativity. China as a typical collective culture country must gain more experience from individual cultures, such as the German or the English etc. If the value changing is too hard to push, the micro environment is also possible to be changed for the creativity development.

A new try was undertaken recently in the field of visual art (Dineen and Niu, 2008). They introduced a creative pedagogic model developed in the U.K. in a class of second-year Bachelor of Arts Graphic Design students in a Chinese higher education institution. The teaching is 7 weeks long. Visual outcomes produced by students from the classes (experimental and controlling) before and during the teaching intervention were judged. And levels of student effort, motivation, enjoyment, and confidence in experiment were assessed through a student questionnaire examining the impact of different pedagogic models on student creative abilities and other related attributes. Both quantitative and qualitative results suggest that the creative methods were highly effective in encouraging learner creativity and related attributes such as intrinsic motivation, enjoyment, and confidence. Actually one of the

biggest characteristics is that they set up a creatively congenial "micro" environment, one which was sufficiently powerful to counter those aspects of the prevailing culture deemed likely to inhibit creative thinking and expression. Not only about artistic creativity, but also about other kinds of creativity these kinds of interventions are necessary to be developed for the use of creativity promotion in both of countries.

If the intervention in elementary or secondary schools is developed to nurture the creativity development of children, the climate, concretely the working feelings of teachers must be of concern as one of the most important steps in the development. This is the main implication of Chapter 5. The seven dimensions like organizational idea, working style, resource availability, teamwork operation, leadership efficacy, learning and progress, and environmental atmosphere are the concrete pointes that the intervention should focus on.

Moreover, in school the young teachers should get much psychological and resource support from the organization of school. It will be better for them growing from a novice to an expert. According to the claims of Sternberg and Horvath (1995) that the prototype expert is knowledgeable and will be so more effectively than the novices, moreover, experts are more likely to arrive at creative solutions to those problems - solutions that are both novel and appropriate. Although the expert teachers do their jobs in the same work place as the novice, they have better perception of the organizational climate than the novice teachers. So the element of teachers is the key element of creativity development and the promoting of students.

There were many new reforms in the German educational system, too. For example, by promoting top-class university research within the framework of the Initiative for Excellence, the Federal Government is aiming to establish internationally visible research beacons in Germany (The Federal Ministry of Education and Research, 2007). Such kind of reform can make a difference between the many German universities, so there can be some

changes in organizational culture of university in Germany. This change of culture can also impact the creativity of students. After all, we shouldn't see the excellent organizational culture only in numbered selected universities, but in each university and in the whole society. In Chapter 2 we found that German students have a better expression of creativity. So how to keep a necessary tradition and renew or optimize the current inadequate system for creativity development of most students is a serious question for discussion.

If we are concerned about the development of intervention programs that increase the likelihood of personal effectiveness of teachers such as general or creativity self-efficacy, or collective efficacy such as cultural efficacy of own culture etc. in school, then such kind of intervention should promote the creative organizational climate of the school, in order to increase teachers' self-efficacy, cultural efficacy and creativity self-efficacy. Strategies for enhancing the creative organizational climate of school could also be based on the knowledge about the seven dimensions of COCI (Chiou, 2006), that is mentioned above. Or more concretely, the strategies should base on the four sources of self-efficacy (Bandura, 1997), that is, mastery experiences, vicarious experiences provided by social models, social persuasion, and reduction of people's emotional arousal (in particular anxiety).

Last but not least, globalization has increased the amount of intercultural contacts and hence the opportunities for gaining multicultural experience. But it is also interesting and important to look more specifically at how qualitatively or quantitatively the experience of types of living or studying abroad affect the creative development and expression.

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<u>Mein Lebenslauf wird aus datenschutzrechtlichen Gründen nicht veröffentlicht</u>

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Erklärung zur Dissertation

Hiermit versichere ich, dass ich die vorgelegte Arbeit selbständig verfasst habe.
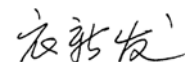Andere als die angegebenen Hilfsmittel habe ich nicht verwendet.
Die Arbeit ist in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden.
Die Arbeit ist nicht veröffentlicht. Die empirischen Kapitel werden zur Veröffentlichung
eingereichen lassen. Im Einzelnen handelt es sich um folgende Manuskripte

1. Yi, X., Scheithauer, H., Lin, C., & Niu, W. (2008). Cultural, bicultural and bilingual influences on artistic creativity: A comparison between German and Chinese students.

2. Yi, X., Scheithauer, H., Lin, C., & Schwarzer, R. (2008). The impact of culture on general self-efficacy, creativity self-efficacy and cultural efficacy.

3. Yi, X., Lin, C., & Scheithauer, H. (2008). Creative organizational climate of school and creativity development of children.

4. Yi, X., Lin, C., Scheithauer, H., & Schwarzer, R. (2008). Creative organizational climate of school and general self-efficacy, creativity self-efficacy, cultural efficacy of teachers.

Alle Artikel sind in Koautorenschaft erschienen, da es sich bei den zugrunde liegenden Datensätzen um gemeinsame Forschungsprojekte handelt. Meine Betreuern und Koautoren Prof. Dr. Herbert Scheithauer, Prof. Dr. Ralf Schwarzer sowie alle anderen Koautoren können bestätigen, dass ich an der Konzeption, Planung, und Durchführung der Forschungsprojekte maßgeblich beteiligt war. Gleichermaßen habe ich die volle Verantwortung für alle Manuskripterstellungen übernehmen.

Berlin,   den 28. Mai 2008   _____
         Datum   Unterschrift

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Appendix

A) Regarding the experiment of artistic creativity (Experimental materials and judging scale).

Experimental materials (German version)

Collage design

Sie werden eingeladen eine Collage zu entwerfen. Bitte wählen Sie zuerst einen von vier Stimmungszuständen aus, den Sie beschreiben möchten, nämlich *fröhlich, traurig, zornig* oder *ängstlich*. Notieren Sie den ausgewählten Stimmungszustand unten auf der Linie. Entwerfen Sie bitte anschließend „um diesen Zustand" herum eine Collage, die dieses Gefühl beschreibt. Verwenden Sie dazu Ihre Vorstellung entsprechend unsere Materialien. Sie können wenige dieser Materialien verwenden oder viele benutzen, aber bitte nur die Materialien benutzen, die Ihnen vorgegeben wurden.
Stimmungszustand (Thema): _____ (Bitte fertigen Sie unten die Collage an.)

Alien drawing

Bitte zeichnen Sie unten nach Ihrer Vorstellung entsprechend *einen Außerirdischen.*

Judging scale (German version)

Erklärung der Beurteilung des psychologischen Experiments

Meine liebe Freude,

Vielen Dank für Deine Teilnahme und Mithilfe der Beurteilung meines Experiments. Dieses Experiment ist ein Teil von meiner Doktorarbeit. Das Thema meiner Arbeit ist „die kulturellen Unterschiede von Denkstil und Kreativität ". Es gibt zwei Teile in disem Experiment, das ist, **Collageentwerfen** und **Außerirdischenzeichnen**.

Die Hinweise von **Collageentwerfen** ist wie folgendes.
„Sie werden eingeladen eine Collage zu entwerfen. Bitte wählen Sie zuerst einen von vier Stimmungszuständen aus, den Sie beschreiben möchten, nämlich **fröhlich, traurig, zornig** oder **ängstlich**. Notieren Sie den ausgewählten Stimmungszustand unten auf der Linie. Entwerfen Sie bitte anschließend „um diesen Zustand" herum eine Collage, die dieses Gefühl beschreibt. Verwenden Sie dazu Ihre Vorstellung entsprechend unsere Materialien. Sie können wenige dieser Materialien verwenden oder viele benutzen, aber bitte nur die Materialien benutzen, die Ihnen vorgegeben wurden. Stimmungszustand (Thema)_____ "

Die Hinweise von **Außerirdischenzeichnen** ist wie folgendes.
„Bitte zeichnen Sie unten nach Ihrer Vorstellung entsprechend einen Außerirdischen."

Bitte beurteil alle Werke nach den folgenden Standards und deinen Meinungen. Zuerst seh bitte alle Werke durch, dann beurteil alle Werke und geb eine Zensur für jedes Werk! Die Zensuren sind von eins (①) bis sieben (⑦). Eins beduetet am schlechtest, und sieben ist am besten, vier (④) bedeutet in der Mittel.
Achtung: Bitte schreib vor allem auf die obenreichte kurze Linie die Nummer des Werks!

Vielen Dank
Ich wünsche Dir dann noch einen schönen Tag!
Xinfa Yi 衣新发

Vor allem füll bitte die folgende Information aus!

Geschlecht: □ männlich □ weiblich
Name der Universität:
Fach:
Nationalität:
Geburtsort/ -datum:
Datum:_____**Ort**:
Name, **Vorname**:

das Beurteilungsformular der Stimmungszuständencollage

Nr. des Werks:_____

Dimension (Definition)		sehr schlecht mittlere sehr gut	Nr.
das kreative Niveau	das Niveau der Kreativität	① ② ③ ④ ⑤ ⑥ ⑦	*1*
das liebenswerte Niveau	Wie gefällt dir das Werk.	① ② ③ ④ ⑤ ⑥ ⑦	*2*
das zum Thema gehörige Niveau	Wie wäre gehörig zum bestimmten Thema	① ② ③ ④ ⑤ ⑥ ⑦	*3*
das technische Niveau	die Technik des Entwerfens	① ② ③ ④ ⑤ ⑥ ⑦	*4*
das vorstellbare Niveau	Die Imagination vom Teilnehmer	① ② ③ ④ ⑤ ⑥ ⑦	*5*
das künstlerische Niveau	Wie wäre die bestimmte ästhetische Wert.	① ② ③ ④ ⑤ ⑥ ⑦	*6*
das ausgearbeitete Niveau	Ins Detail fertig machen	① ② ③ ④ ⑤ ⑥ ⑦	*7*
der generelle Eindruck	Deine generelle Beurteilung des Werks	① ② ③ ④ ⑤ ⑥ ⑦	*8*
Bitte urteil nach Deine eigene generelle Eindruck den folgenden Fragen und geb jedem Werk noch einen neuen Name.			
1. Aus welchem Land kommt der Author? ①deutsch; ②chinesisch; ③andere			*9*
2. Ist der Author die Fachleute (Maler, Designer usw.) oder nicht?		①ja; ②nein	*10*
3. Ist der Author Mann oder Frau?		①Mann; ②Frau	*11*
4. ein neuer Name			*12*

B) Regarding the general creativity (Creative Organizational Climate Inventory, Beijing Test of Creative Thinking).

The Creative Organizational Climate Inventory (German version)

Bitte kreuzen Sie Ihre Antworten auf der Skala von ① bis ⑥ an. ① = vollkommen unzutreffend (stimmt überhaupt nicht) und ⑥ = absolut zutreffend (stimmt genau).	
1.Unsere Schule legt großen Wert auf Humanressourcen und Innovationsdenken.	① ② ③ ④ ⑤ ⑥
2.Ich kann, wenn ich das möchte, selbstständig und ohne dass ich dabei abgelegt werde, arbeiten.	① ② ③ ④ ⑤ ⑥
3.Ich habe genug Möglichkeiten oder Materialien, um meine Arbeit durchzuführen.	① ② ③ ④ ⑤ ⑥
4.Meine Lehrergruppe und Arbeitspartner verfolgen positive und gemeinsame Absichten.	① ② ③ ④ ⑤ ⑥
5.Mein Direktor respektiert meine kreativen Arbeitsideen und unterstützt diese.	① ② ③ ④ ⑤ ⑥
6.Meine Schule bietet uns reichliche Chancen in Bezug auf das fortgeschrittene Studium an, um uns zu einer zusätzlichen Ausbildung zu ermutigen.	① ② ③ ④ ⑤ ⑥
7.Die Atmosphäre meines Arbeitsplatzes ist fördernd und angenehm.	① ② ③ ④ ⑤ ⑥
8.Unsere Schule tritt für die Kommunikation der Ideen zwischen jene, die weiter Oben und jene weiter Unten stehen, ein.	① ② ③ ④ ⑤ ⑥
9.Ich habe die uneingeschränkte Möglichkeit, meine eigene Arbeit zum Einsatz zu bringen.	① ② ③ ④ ⑤ ⑥
10.Ich kann ausreichende Daten und Informationen für die Förderung bekommen.	① ② ③ ④ ⑤ ⑥
11.Meine Kollegen haben dieselben pädagogischen Ziele wie ich.	① ② ③ ④ ⑤ ⑥
12.Mein Direktor ist zu einer angenehmen und harmonischen Kommunikation fähig.	① ② ③ ④ ⑤ ⑥
13.Die Ausbildung und das Training der Lehrer sind wichtige Aufgaben unserer Schule.	① ② ③ ④ ⑤ ⑥
14.Ich habe einen angenehmen, freien und zufrieden stellenden Arbeitsplatz.	① ② ③ ④ ⑤ ⑥
15.Unsere Schule ist konservativ und wenig kreativ.	① ② ③ ④ ⑤ ⑥
16.Ich kann meine Arbeitsziele und meinen Stunden-plan selbst entwerfen.	① ② ③ ④ ⑤ ⑥
17.Ich kann gezielte Hilfe von Fachleuten bekommen, wenn ich diese benötige.	① ② ③ ④ ⑤ ⑥
18.Meine Kollegen können einander unterstützen und miteinander harmonieren.	① ② ③ ④ ⑤ ⑥
19.Mein Direktor kann neue Ideen und unterschiedliche Vorschläge respektieren.	① ② ③ ④ ⑤ ⑥
20.Meine Schule legt Wert auf Informationssammlung, den Gewinn und die Kommunikation neuer Erkenntnisse.	① ② ③ ④ ⑤ ⑥
21.Meine Arbeitsumgebung treibt meine Inspiration und meine Ideen voran.	① ② ③ ④ ⑤ ⑥

22.Unsere Schule kann Bedingungen schaffen, die das Entstehen von Innovationen ermöglicht.	① ② ③ ④ ⑤ ⑥
23.Meine Arbeit ist eine besondere Herausforderung für mich.	① ② ③ ④ ⑤ ⑥
24.Ich bekomme oft Unterstützung von anderen Zweigstellen oder Schulen, die meine Arbeit effektiv fördern.	① ② ③ ④ ⑤ ⑥
25.Meine Kollegen können intensiv miteinander diskutieren und untereinander austauschen, was sie gelernt haben.	① ② ③ ④ ⑤ ⑥
26.Mein Direktor kann seinen Mitarbeitern vertrauen und wird seiner Position in angemessener Art und Weise gerecht.	① ② ③ ④ ⑤ ⑥
27.Unsere Schule legt großen Wert auf die Reaktionen der Schüler und die Meinung der Eltern.	① ② ③ ④ ⑤ ⑥
28.Ich kann mir meine Arbeitsumgebung frei einrichten.	① ② ③ ④ ⑤ ⑥
29.Unsere Schule wird dazu ermutigt, aus Fehlern zu lernen.	① ② ③ ④ ⑤ ⑥
30.Meine Kollegen können durch eine positive Form der Kommunikation Probleme und Konflikte lösen.	① ② ③ ④ ⑤ ⑥
31.Mein Direktor gilt als ein Vorbild für das Lehrerkollegium.	① ② ③ ④ ⑤ ⑥
32.Meine Kollegen, die in ihrer Ausbildung fortgeschritten sind, werden von der Schule unterstützt und in wichtige Positionen eingesetzt.	① ② ③ ④ ⑤ ⑥
33.In meiner Arbeitsumgebung bekomme ich oft die Zustimmung und Unterstützung meiner Kollegen.	① ② ③ ④ ⑤ ⑥
34.Unsere Schule strebt Freiheit und Innovation an.	① ② ③ ④ ⑤ ⑥
35.Unsere Schule fördert intensiv die wissenschaft-lichen Aktivitäten, ermutigt zum Lernen und nutzt die Erfolge und die Erfahrungen anderer.	① ② ③ ④ ⑤ ⑥

The Beijing Test of Creative Thinking (German version)

Ungewöhnliche Verwendungsmöglichkeiten des Löffels

Der Löffel ist ein wichtiges Tischgeschirr, mit dem wir Reis, Suppe und Ketchup schöpfen können. Natürlich können wir mit einem Löffel auch andere Dinge bewerkstelligen. Außerdem gibt es bestimmt noch weitere Möglichkeiten zur kreativen Verwendung des Löffels. In diesem Spiel geht es nun um Folgendes: Versuchen Sie bitte herauszufinden, für welche Zwecke der Löffel außerdem noch verwendet werden kann und welche ungewöhnlichen und kreativen Verwendungsmöglichkeiten der Löffel hergibt. Schreiben Sie bitte diese Möglichkeiten auf, notieren Sie jede Verwendung auf einer neuen Linie. Je mehr Sie finden können, desto besser.
Achtung: Die Löffel können aus Metall, Keramik, Holz oder Plastik usw. bestehen. Die Größe und Länge der Löffel entspricht der normaler Eßlöffel, mit denen wir täglich essen. Sie können auch mehrere Löffel gleichzeitig benutzen.
(***ZEIT***: 10 Minuten)

„+" ⟶ Zeichnung

„+" ist ein Symbol. Sie sehen unten insgesamt 54 „+" in verschiedenen Größen. Wir bitten Sie, innerhalb von 10 Minuten so produktiv wie möglich mit der Hilfe des „+"unterschiedliche Bilde zu zeichnen. Zu diesem Symbol „+" können Sie selbstständig etwas hinzufügen bzw. verändern. Bitte schreiben Sie unter jedem Bild auf die dort befindliche Linie einen Titel, was das Bild darstellen soll.

Bitte beachten Sie noch einmal, dass das von Ihnen gezeichnete Bild *kein Schrift- zeichen oder Wort*, sondern einem Gegenstand darstellen soll.

(**ZEIT:** 10 Minuten)

C) Regarding the efficacy (the scales of General Self-Efficacy, Creativity Self-Efficacy and Cultural Efficacy, English version).

General Self-Efficacy
1 I can always manage to solve difficult problems if I try hard enough.
2 If someone opposes me, I can find the means and ways to get what I want.
3 I am certain that I can accomplish my goals.
4 I am confident that I could deal efficiently with unexpected events.
5 Thanks to my resourcefulness, I can handle unforeseen situations.
6 I can solve most problems if I invest the necessary effort.
7 I can remain calm when facing difficulties because I can rely on my coping abilities.
8 When I am confronted with a problem, I can find several solutions.
9 If I am in trouble, I can think of a good solution.
10 I can handle whatever comes my way.
Note. The English version was developed in 1985, published in 1995, and revised slightly in 2000 (Schwarzer & Jerusalem, 1995).

Cultural Efficacy Scale
1 The people in this country are confident that they could deal efficiently with unexpected events.
2 The people in this country have the resourcefulness to handle unforeseen situations.
3 The people in this country can solve most problems if they invest the necessary effort.
4 The people in this country can remain calm when facing difficulties because they can rely on their coping abilities.
5 When the people in this country are confronted with a problem, they can find several solutions.
6 The people in this country can handle whatever comes their way.

Creativity Self-Efficacy Scale
1 I am certain that I can produce novel and appropriate ideas.
2 I am confident that I could tactfully deal with unexpected events.
3 Thanks to my resourcefulness, I can produce creative products.
4 When I am confronted with a problem, I can try several solutions to solve it.
5 I can think independently and not echo what other says.

Response Format:
1 = Not at all true 2 = Hardly true 3 = Moderately true 4 = Exactly true