

This article was downloaded by: [Shaanxi Normal University]

On: 17 June 2013, At: 04:17

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Creativity Research Journal

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/hcrj20>

### Cultural and Bilingual Influences on Artistic Creativity Performances: Comparison of German and Chinese Students

Xinfa Yi <sup>a</sup>, Weiping Hu <sup>a</sup>, Herbert Scheithauer <sup>b</sup> & Weihua Niu <sup>c</sup>

<sup>a</sup> Key Laboratory of Modern Teaching Technology, Ministry of Education of China and Shaanxi Normal University, China

<sup>b</sup> Freie Universität Berlin, Germany

<sup>c</sup> Pace University, USA

Published online: 08 Feb 2013.

To cite this article: Xinfa Yi, Weiping Hu, Herbert Scheithauer & Weihua Niu (2013): Cultural and Bilingual Influences on Artistic Creativity Performances: Comparison of German and Chinese Students, *Creativity Research Journal*, 25:1, 97-108

To link to this article: <http://dx.doi.org/10.1080/10400419.2013.752260>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

# Cultural and Bilingual Influences on Artistic Creativity Performances: Comparison of German and Chinese Students

Xinfa Yi and Weiping Hu

*Key Laboratory of Modern Teaching Technology, Ministry of Education of China and Shaanxi Normal University, China*

Herbert Scheithauer

*Freie Universität Berlin, Germany*

Weihua Niu

*Pace University, USA*

Empirical research on the relationship between culture and creativity has thus far yielded no consistent results. Investigations of the differences are mostly post-hoc, and results are inconclusive. A creativity-value-oriented theory is proposed to explain cultural differences, as an alternative to ethnic and language effects. This study was conducted to compare the performances of artistic creativity of Germans and Chinese. Results revealed that the four groups of students examined (German students of Caucasian descent, German students of Asian descent, Chinese students studying abroad, and Chinese students studying in China) differed in their artistic creativity. German participants (Caucasian Germans and Asian Germans) produced more creative and aesthetically pleasing artwork than did their Chinese counterparts (Chinese studying abroad and domestic Chinese). This difference was observed by both German and Chinese judges. There no significant subgroup differences in creative performances—no difference between the two German groups, and no difference between the two Chinese groups. Finally, although there were significant differences between German judges, Chinese judges studying abroad, and domestic Chinese judges in judging the artworks, these were not due to a preference for artwork from students from their own cultural background. Chinese and German judges roughly agreed on what constitutes creativity. These results suggest that cultural differences affect creative performances.

---

Thanks to Chongde Lin and Ralf Schwarzer for their support, and the members of the Department of Educational Science and Psychology at Freie Universität Berlin and the members of the institute of Developmental Psychology at Beijing Normal University. At the same time, thanks to Kaiping Peng and Christian Nowak for draft reading.

This research was supported in part by National Nature Science Foundation of China (Grant No. 31100755), Scientific Foundation for Returned Overseas Chinese Scholars, Ministry of Education and China Postdoctoral Science Foundation, as well as 2011 Teacher Education and Teaching Reform Projects and 2012 Master Students Education Project (Grant No. GERP—12—04) of Shaanxi Normal University to the first author. And it was also partly supported by the Fundamental Research Funds for the Central Universities (Grant No. GK201101001). Thanks to Lingshan Liu, Bärbel Günter, Amelie Wiedemann, Jianpei Yang, Jingzhu Lv who helped us with the translation of the researching materials. The time all of the 21 judges devoted to the experiment of artistic creativity is much appreciated; they are Stefan Schaffer, Erik Bernoth, Sascha Wagner, Jörg-Manuel von Brietzke, Lena Remme, Jana Richert, Lisa Warner, Junling Yao, Yaqin Yang, Jing Qu, Jun Zhang, Yang Yu, Fangzhou Zhao, Guanggang Ma, Zongqian Zhang, Jianhui Li, Lin Li, Dr. Xuanwei Cao, Lili Li, Xiuling Wu, and Nan Wu. A lot of thanks go to the people who helped us with the sampling in Germany and China; they are Picheng Wang, Yi Lu, Tao Yang, Ibrahim Raoua Ouedraogo, Xuyi Xu, and Xiaohao Wang.

Correspondence should be sent to Xinfa Yi, Key Laboratory of Modern Teaching Technology, Ministry of Education of Shaanxi Normal University, 710062, Xi'an, China. E-mail: xinfayi@yahoo.cn or yixinfa@snnu.edu.cn

A widely used definition of creativity is one's ability to produce ideas or products that are judged by others to be both new and appropriate (Amabile, 1996; Csikszentmihalyi, 1996; Lin, 1995, 1999; Sternberg & Lubart, 1991, 1996). Artistic creativity refers to the creativity expressed in the arts, such as visual art, music, literature, dance, theatre, film, and mixed media (Alland, 1977, cited in Niu & Sternberg, 2001). As art provides a useful way to examine cultural differences in creativity (Niu & Sternberg, 2001, 2003), this study focused on artistic creativity performances in the visual arts, and, in particular, on drawing and collage-making.

There are two approaches to study the extent and process of the environmental impact on individual creativity. One approach is to explore the effect of micro environment such as work place, classroom, family etc. on creativity. The other approach focuses on the relationship between the relative macro environment such as multicultural experience or individualism-collectivism culture and creativity (Yi, 2008).

Results of research on the issue whether culture affects creative performances seem to be mixed. Whether ideas or products are judged as creative or not has been found to be related to the judges' culture (Niu & Sternberg, 2001, 2003).

Csikszentmihalyi (1999) emphasized the influence of social systems and field judges on creative outcomes, Lubart and Sternberg (1998) stated that the cultural influence on the concept, expression, direction and nurturing of creativity. According to Urban (2003) the environmental conditions of various systems may discourage, inhibit, and suppress or nurture, stimulate, inspire, and cultivate creative processes respectively. Environmental frames influence children's creativity development, actual creative processes, and finally the acceptance and appreciation of creative products although the concrete mechanisms are not clear.

Some researchers focus on the relationship between multicultural or multilingual experience and creativity development or enhancement of creativity. Ka-yee Leung, Maddux, Galinsky, and Chiu (2008) showed that multicultural experiences increase 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 by Ricciardelli (1992) consisting of 24 primary studies suggested that most of the studies reviewed revealed a significant positive correlations between bilingualism and creativity (Ricciardelli, 1992). Kaufman, Baer, and Gentile (2004) found bilingual superiority on all of the writing tasks.

Not all of the studies reviewed by Ricciardelli (1992) found that bilingual people have higher creativity, and the results showed no consistency in different assessments of creativity in these studies. Ricciardelli argued

that there may be a limit of the language level of bilingualism. When bilinguals can really be involved in both cultures, then they can show superiority of creativity (Lubart, 1990, 1999).

Niu and Sternberg (2001) compared 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. Niu and Sternberg concluded that an independent self-oriented culture is more encouraging to the development of artistic creativity than is an interdependent self-oriented culture. Niu and Sternberg conclude that other explanations, such as differences in people's attitudes toward and motivation for engaging in art activities, or socioeconomic factors might account for differences in people's artistic creativity.

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 students' creativity development. 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, Walczyk, Griffith-Ross, Tobacyk, and Walczyk (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. Results 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 (2001) 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 argue that their results run

counter to the belief that there are wide cultural variations in the evaluation of and attitudes toward creativity.

Zhou, Zha, and Shi (1995) found that on the dimension of productive thinking, regular and gifted Chinese children achieved significantly higher scores than German children. Their results also suggested that gifted children in both countries were more creative than regular 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: traditional culture, social environment, family education, science curriculum, science instruction, examination method, and science teachers. This list includes almost every aspects of cultural impact, so it does need more study to precisely investigate the relationship between the environmental variables and creativity expression.

Shen and Lin (2007) revised the SCTA of Hu and Adey (2002) to compare the scientific creativity of British, Japanese and Chinese adolescents. They found that: (a) 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. (b) The scores on the dimensions of Fluency, Flexibility, Problem Raising, and Scientific Imagination of Chinese adolescents were significantly higher than of British and Japanese adolescents, and there was no significant difference between British and Japanese adolescents. (c) 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. (d) 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. (e) The score on the dimension of Improvement of Production of

Chinese adolescents was significantly lower than the scores of British and Japanese adolescents, 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-and-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 their Japanese and British counterparts. They argued that there is consistency between the problem solving ability in real world. They found that Japanese and British participants could draw more novel and practical productions than Chinese counterparts, which demonstrated that probably there was some of relations between artistic creativity and scientific ability.

From the studies reviewed so far it can be assumed that there is no consensus on cultural differences of creativity and that the results seem to be mixed. Some researchers found that Chinese probands were more creative, but others found that Germans or Americans were more creative. Explanations for a superiority in creativity are also very different. Some researchers argue that individualistic culture was more enhancing for creativity development than collectivistic culture, others argue that the multicultural experience was more important for the enhancement of creativity, regardless of the type - individualistic or collectivistic respectively. A third group of researchers argue that the micro environment such as organizational climate at the workplace, school, or kindergarten, was mostly important.

## THIS STUDY

Two questions were addressed in this study. First, to what extent do cultural experiences influence people's artistic creative performances? Second, are people who have two or more cross-cultural experiences, like students studying abroad or immigrants, more creative than those who have only one cultural experience? To answer these questions, four different participant groups were recruited for the experiment: German, Asian German, Chinese studying abroad, and domestic Chinese. 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 groups of participants mentioned earlier. This investigation is unique in that it will compare the works made by four groups with different cultural background, namely, totally Chinese cultural background,

totally German cultural background, oversea Chinese cultural background and German Asian cultural background.

Based on these main objectives and on the study results reviewed, 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). Consistent with the findings and claims of Niu (2001, 2003) that an individualistic culture is more enhancing the creativity development, a first prediction was 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, a second prediction that those who have bicultural or bilingual experiences would be more creative than those who have only one cultural experience. Specifically, in the respective culture, it can be 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 Freie Universität 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](http://www.StudieVZ.de)). There were 29 German students and 16 Asian German students, all of whom have never studied 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. 31 students studying abroad of the Chinese participants were from Freie Universität Berlin and Humboldt Universität Berlin. All of them had previously studied in one of the Chinese universities and continued their studies in one of the German Universities. The other 30 domestic Chinese students were from Tsinghua University Beijing and Tongji University Shanghai. As the German students, at the time of this study they have never studied abroad.

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

Mean age of the German participants was 24.25 years (age range from 19 to 36 years,  $SD = 3.48$ ), and for the Chinese it was 24.52 years (age range from 20 to 42,  $SD = 3.88$ ). The mean age of Caucasian German participants was 24.96 years (age range from 19 to 36,  $SD = 3.86$ ), and for the Asian Germans it was 23.14 years (age range from 20 to 29,  $SD = 2.51$ ). The mean age of Chinese studying abroad participants was 26.64 years (age range from 22 to 42 years,  $SD = 4.15$ ), and for the domestic Chinese it was 22.53 years (age range from 20 to 29 years,  $SD = 2.24$ ).

As mentioned, the ethnic background of the German students was: 29 Caucasian Germans and 16 Asian Germans. In the group of the Asian Germans there was 1 Vietnamese German, 2 Hong Kong-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. Twelve of them were second-generation Germans and 4 of them were third-generation Germans.

All Chinese participants were Chinese natives. Chinese studying abroad have been in Germany from 2.5 months to 66 months ( $M = 19.3$  months). Eighteen of them spoke fluent German. Seven 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.* 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 (Amabile, 1982), and (b) drawing an extraterrestrial alien (Ward, 1994). The principles used to select two tasks were the same like Niu and Sternberg's (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. The 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."

Participants 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. The group of judges consisted of seven German students from Freie Universität 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 Freie Universität Berlin and Technische Universität 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, all of the artworks from the participants in Germany and China were collected, and then they were scanned and translated 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), and
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 ranging from (1) very low to (7) very high. They were asked to look at all the artworks before they started their judging.

The Consensual Assessment Technique (CAT) previously mentioned and used in this study has been developed by Amabile and validated by other researchers in creativity research (Amabile, 1982, 1996; Niu & Sternberg, 2001, 2003; Chen et al., 2002, Kaufman et al., 2004). Based on CAT principles, the scale with eight dimensions mentioned earlier was used in the judgment.

## RESULTS

### Interjudge Reliabilities

The inter-judge reliabilities were measured by using Cronbach's coefficient alpha standardized with SPSS 13.0. From each group of judges, 16 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

TABLE 1  
Interrater Reliabilities Among Different Groups of Judges  
for Different Dimensions in Experiments of Collage Making  
and Alien Drawing

	<i>Creat</i>	<i>Like</i>	<i>Appr</i>	<i>Tech</i>	<i>Imag</i>	<i>Art</i>	<i>Elab</i>	<i>Gene</i>
Collage making								
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								
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.

(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.

### The Effect of Cultural Experience

At first, a MANOVA was conducted to test cultural differences in the eight dimensions of artistic creative performance. Very significant cultural differences were found,  $F(8, 89) = 3.66, p < .01$ . Results suggest that the German students ( $M = 4.36$ ) obtained significantly higher scores than the Chinese Students ( $M = 4.12$ ) 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 a significant difference among the four groups of cultural experiences. An ANOVA was conducted to compare the influences of different cultural experiences on creativity performance. The results suggested that there was no significant difference between the German and Asian German students (the former  $M = 4.37$  and the latter  $M = 4.35$ ),  $t = .44, p = .66$ . Moreover, there was also no significant difference between the Chinese studying abroad and domestic Chinese students (the former  $M = 4.11$  and the latter  $M = 4.05$ ),  $t = 1.66, p = .10$ . The

TABLE 2  
Comparison of Artistic Creativity and Other Artistic Qualities of  
German, Asian German, Chinese Studying Abroad, and Domestic  
Chinese Participants' Artwork in Experiment of Collage Making

<i>Collage Making</i>	<i>Chinese</i>				<i>Total Mean</i>
	<i>Caucasian German</i>	<i>Asian German</i>	<i>Studying Abroad</i>	<i>Domestic Chinese</i>	
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 judge	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 judge	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 judge	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 judge	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 judge	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 judge	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 judge	4.41	4.67	4.06	3.91	4.19
Judge mean	4.30	4.45	4.00	3.74	4.07
General impression					
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

(Continued)

TABLE 2  
(Continued)

<i>Collage Making</i>	<i>Chinese</i>				<i>Total Mean</i>
	<i>Caucasian German</i>	<i>Asian German</i>	<i>Studying Abroad</i>	<i>Domestic Chinese</i>	
Judge mean	4.45	4.60	4.37	4.14	4.36
Total mean	4.46	4.60	4.37	4.14	4.36

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 and Table 3).

A significant main effect of Judge was found,  $F(2, 382) = 195.14, p < .001$ , showing that Chinese judges studying abroad were inclined to give higher ratings ( $M = 4.26$ ), on average, than did the domestic Chinese ( $M = 4.22$ ) and the German judges ( $M = 3.68$ ; see Table 2 and Table 3). Anyway, there was no significant 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.

A significant three-way interaction (Cultural experience  $\times$  Task  $\times$  Gender) was found,  $F(3, 381) = 21.17, p < .001$ , indicating that the impact of the cultural experiences to be creative was different between tasks and genders. Specifically in the female group, with the task of collage-making Asian German students obtained the highest score ( $M = 4.81$ ), followed by the German students' ( $M = 4.46$ ), the Chinese students studying abroad ( $M = 4.33$ ) and the domestic Chinese students' ( $M = 4.19$ ) being the last one. Correspondingly, in the male group German students ( $M = 4.45$ ) were the highest, followed by the Asian German students' ( $M = 4.33$ ), the Chinese students studying abroad ( $M = 4.23$ ), and finally domestic Chinese students' ( $M = 4.05$ ) being the last. However, in the female group, concerning the task of alien drawing, German students obtained the highest score ( $M = 4.44$ ), followed by the Asian German students ( $M = 3.99$ ), the Chinese students studying abroad ( $M = 3.77$ ), and domestic Chinese students' ( $M = 3.70$ ) being the last. Correspondingly, in the male group, Asian German students ( $M = 4.20$ ) scored the highest, followed by the German students ( $M = 4.09$ ), the Chinese students studying abroad ( $M = 4.26$ ), with domestic Chinese students' ( $M = 4.12$ ) being the last. However, the sample size of present study is a bit small, so it should be careful to put much weight on the three-way interaction. A bigger sample size is needed to reconfirm the findings in future studies.

The Effect of Task

A significant main effect of task was found,  $F(1, 383) = 108.21, p < .001$ , suggesting that participants generally

TABLE 3

Comparison of Artistic Creativity and Other Artistic Qualities of German, Asian German, Chinese Studying Abroad, and Domestic Chinese Participants' Artwork in Experiment Alien Drawing

<i>Alien Drawing</i>	<i>Chinese</i>				<i>Total Mean</i>
	<i>Caucasian German</i>	<i>Asian German</i>	<i>Studying Abroad</i>	<i>Domestic Chinese</i>	
<b>Creativity</b>					
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
<b>Likeability</b>					
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
<b>Appropriateness</b>					
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 judge	4.75	4.62	4.24	4.35	4.45
Judge mean	4.59	4.66	4.04	4.24	4.32
<b>Technical quality</b>					
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 judge	3.99	4.00	3.79	3.89	3.90
Judge mean	3.95	3.87	3.66	3.74	3.79
<b>Imagination</b>					
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 judge	4.80	4.36	4.45	4.44	4.52
Judge mean	4.50	4.27	4.19	4.30	4.31
<b>Artistic level</b>					
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 judge	3.98	3.85	3.75	3.81	3.84
Judge mean	3.96	3.85	3.70	3.78	3.81
<b>Elaboration</b>					
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 judge	4.25	3.99	3.82	3.95	3.99
Judge mean	4.00	3.78	3.58	3.72	3.76
<b>General impression</b>					
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 judge	4.50	4.07	4.04	4.07	4.17

(Continued)

TABLE 3  
(Continued)

Alien Drawing	Chinese				Total Mean
	Caucasian German	Asian German	Studying Abroad	Domestic Chinese	
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  $p < .01$ .

obtained much higher scores in their collage makings ( $M = 4.36$ ) than in their alien drawings ( $M = 4.07$ ). A significant two-way interaction Task  $\times$  Judge was found,

TABLE 4

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

Note. Creat = creativity; Like = likeability; Appr = appropriateness; Tech = technical quality; Imag = imagination; Art = artistic level; Elab = elaboration; Gene = general impression.

$F(2, 382) = 11.20, p < .001$ , suggesting the difference in task performance was affected by the three groups of judges. Further significant interactions 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 judgment.

The Effect of Dimension

A significant effect of dimension was found, 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 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, and general impression (see Table 4).

The correlations of each pair of scores on the eight dimensions of alien drawing were significant (all above .60,  $ps < .001$ ). Most of the correlations of the eight

TABLE 5  
Correlations Among Different Dimensions of Collage Making

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

Note. Creat = creativity; Like = likeability; Appr = appropriateness; Tech = technical quality; Imag = imagination; Art = artistic level; Elab = elaboration; Gene = general impression.

dimensions related to collage design were significant; only four correlations were not significant (correlations between the dimensions 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 5 and Table 6). The results suggested that the criteria people used to judge artistic creativity and aesthetic qualities do not correlate with each other in the two tasks. But criteria used judging within the respective task were basically highly correlated.

### The Effect of Gender

A main effect for gender was not found,  $F(1, 383) = .04$ ,  $p = .85$ , but a significant interaction Cultural experience  $\times$  Gender,  $F(3, 381) = 3.90$ ,  $p < .001$ , suggesting 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 ( $M = 24.25$ ) and Chinese participants ( $M = 24.52$ ). In order to know whether the cultural difference in performance is partly due to the age factor, age was used as a covariate and conducted a MANCOVA. There was no effect of age,  $F(8, 81) = .55$ ,  $p = .82$ . Therefore, it is safe to rule out age as factor in explaining the cultural differences in this Experiment.

TABLE 6  
Correlations Among Different Dimensions of Alien Drawing

<i>Alien</i>								
<i>Drawing</i>	<i>Creat</i>	<i>Like</i>	<i>Appr</i>	<i>Tech</i>	<i>Imag</i>	<i>Art</i>	<i>Elab</i>	<i>Gene</i>
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 Creat = creativity; Like = likeability; Appr = appropriateness; Tech = technical quality; Imag = imagination; Art = artistic level; Elab = elaboration; Gene = general impression.

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

## 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. This means that the second hypothesis was not confirmed saying that those who have bicultural experiences were more creative than those who have experience with one culture only. Our results do not seem to support Lubart's (1999) argument that there is a significant positive correlation between bilingualism, bi-cultural experience, and creativity. 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 of Asian German students, this result is best viewed 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. From 1872 till now, the policy to send students to study abroad was always an important part of Chinese national strategy of modernization (China Scholarship Council, 2007; Yung, 1909/2005). In 1872, during 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. One hundred and thirty-five 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 it is supposed 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 creative performance 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. 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, 2007; Niu & Sternberg, 2001, 2003). Such testing systems also promote homogeneity and may diminish the students' motivation to pursue their own interests rather than exam-related academic work. In this 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.

### Can Culture Directly Influence People's Artistic Expression?

As this 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 creative performance than did Chinese students. Both German and Chinese judges rated artworks by Germans as more creative than those by Chinese. Therefore, the 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 selected measures controlled 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 creative performances. The interaction between cultural experience and other variables, especially task, was also found. Why did participants show different performances in the different kinds of experimental tasks? Probably the characteristics of the two art tasks should be analyzed.

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 the task of collage design is compared with the task of alien drawing, the latter task the participants used 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 creative performance. 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 & Sternberg, 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, it can be supposed that the common grounds shared by them are greater than those shared by Americans and Chinese, or by Germans and Chinese.

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 Creative Performance?

The study showed significant differences between German judges, Chinese judges studying abroad, and domestic Chinese judges. But as mentioned earlier, the difference did not mean that judges favor 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. This difference was attributed 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, similar results of the reliability scores that Chinese judges were dissimilar, with more consensus in judging artworks than 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 this 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 the 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.

### REFERENCES

- Alland, A., Jr (1977). *The artistic animal: An inquiry into the biological roots of art*. Garden City, NY: Anchor Press.
- Amabile, T. M. (1982). Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43, 997-1013.
- Amabile, T. M. (1996). *Creativity in context: Update to "The social psychology of creativity"*. Boulder, CO: Westview Press.
- Binnie-Dawson, J. L., & Choi, P. P. (1982). A study of perceptual and cultural cues in Chinese and Western paintings. *Psychologia: An International Journal of Psychology in the Orient*, 25, 18-31.
- Chen, C., Kasof, J., Himsel, A. J., Greenberger, E., Dong, Q., & Xue, G. (2002). Creativity in drawings of geometric shapes: A cross-cultural examination with the consensual assessment technique. *Journal of Cross-Cultural Psychology*, 33, 171-187.
- The China Scholarship Council. (2007). *The name list of national scholarship project of the construction of high-level university of 2007*. Retrieved January 20, 2008, from [http://www.csc.edu.cn/gb/downloaddoc/2007/gsp\\_list.htm](http://www.csc.edu.cn/gb/downloaddoc/2007/gsp_list.htm).
- Csikszentmihalyi, M. (1996). *Creativity: Flow and the psychology of discovery and invention*. New York, NY: HarperCollins.
- Csikszentmihalyi, M. (1999). Implications of a systems perspective for the study of creativity. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 313-335). New York, NY: Cambridge University Press.
- Haritos-Fatouros, M., & Child, I. L. (1977). Transcultural similarity in personal significance of esthetic interests. *Journal of Cross-Cultural Psychology*, 8, 285-298.
- Hofstede, G. (1980). *Culture's consequences: International differences in work-related values*. Beverly Hills, CA: Sage.
- Hu, W. (2001). *The development of adolescents' scientific creativity* (Dissertation in Chinese). Beijing Normal University, Beijing, China.
- Hu, W., & Adey, P. (2002). A scientific creativity test for secondary school students. *International Journal of Science Education*, 24, 384-403.
- Kaufman, J. C., Baer, J., & Gentile, C. A. (2004). Differences in gender and ethnicity as measured by ratings of three writing tasks. *Journal of Creative Behavior*, 38, 56-69.
- Leung, A. K.-Y., Maddux, W. W., Galinsky, A. D., & Chiu, C.-Y. (2008). Multicultural experience enhances creativity. *American Psychologist*, 63, 169-181.
- Lin, C. (1995). *Development psychology*. Beijing, China: People Education Press. [in Chinese]
- Lin, C. (1999). *Learning and development*. Beijing, China: Beijing Normal University Press. [in Chinese]
- Lubart, T. I. (1990). Creativity and cross-cultural variation. *International Journal of Psychology*, 25, 39-59.
- Lubart, T. I. (1999). Creativity across cultures. In R. J. Sternberg (Ed.), *Handbook of creativity* (pp. 339-350). New York, NY: Cambridge.

- Lubart, T. I., & Sternberg, R. J. (1998). Creativity across time and place: Life span and cross-cultural perspective. *High Ability Studies, 9*, 59–74.
- Niu, W. (2007). Western influences on Chinese educational testing. *Comparative Education, 43*, 71–91.
- Niu, W., & Sternberg, R. J. (2001). Cultural influences on artistic creativity and its evaluation. *International Journal of Psychology, 36*, 225–241.
- Niu, W., & Sternberg, R. J. (2003). Societal and school influences on student creativity: The case of China. *Psychology in the Schools, 40*, 103–114.
- Ricciardelli, L. A. (1992). Creativity and bilingualism. *Journal of Creative Behaviour, 26*, 242–254.
- Schwarzer, R. (1989). *Statistics software for meta-analysis Version 5.3*. Retrieved January 20, 2007 from [http://userpage.fu-berlin.de/~health/meta\\_e.htm](http://userpage.fu-berlin.de/~health/meta_e.htm)
- Shen, J., & Lin, C. (2007). A cross-cultural study on the creativity of students and the explicit concept of creativity of teachers in middle-school. Part 4 of the project report: *Studies on creative talents and innovation of education*, Supported by Key-Program of Philosophy and Social Science, Ministry of Education of P. R. China (03JZD0034), 148–195. [in Chinese]
- Sternberg, R. J., & Lubart, T. I. (1991). An investment theory of creativity and its development. *Human Development, 34*, 1–31.
- Sternberg, R. J., & Lubart, T. I. (1996). Investing in creativity. *American Psychologist, 51*, 677–688.
- Urban, K. K. (2003). The general and special case: Development and nurturing of creativity. In U. Anuruthwong, S. Hiranburana, & Ch. Piboonchol (Eds.) *Igniting children potentials and creativity. Proceedings of the 7th Asia-Pacific Conference on giftedness* (pp. 70–91). Bangkok, Thailand: Srinakharinwirot University.
- Ward, T. B. (1994). Structured imagination: The role of category structure in exemplar generation. *Cognitive Psychology, 27*, 1–40.
- Yi, Xin-Fa. (2008). *Creativity, efficacy and their organizational, cultural influences* (Ph.D. Dissertation). Freie Universität Berlin. Retrieved from [http://www.diss.fu-berlin.de/diss/receive/FUDISS\\_thesis\\_000000004778](http://www.diss.fu-berlin.de/diss/receive/FUDISS_thesis_000000004778)
- Yung, W. (2005). *My life in China and America*. Beijing, China: Dongfang Press. (Original work published 1909)
- Zha, P., Walczyk, J. J., Griffith-Ross, D. A., Tobacyk, J. J., & Walczyk, D. F. (2006). The impact of culture and individualism–collectivism on the creative potential and achievement of American and Chinese adults. *Creativity Research Journal, 18*, 355–366.
- Zhou, L., Zha, Z., & Shi, J. (1995). A cross-cultural study on the test of FGA among the children of the fifth and seventh grades between China and Germany. *Psychological Development and Education, 1*, 19–23. [in Chinese].