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Influence of Cultural Exposure upon Artistic Creativity Performance: A Comparison of 4 - 8 Years Old Children in Guizhou and Macao, China

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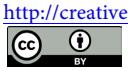

Abstract

This study aimed to compare and contrast the artistic creative performances of students living in two regions with different socio-cultural backgrounds. The artistic creative performance of 132 four to eight years old students in Guizhou (N = 60) and Macao (N = 72) in China was analysed. Findings revealed that the Macao students performed better than Guizhou students in terms of artistic creativity performance measured in this study. Based on the p value of Consensual Assessment Technique (CAT) scale, Macao students scored higher in 6 dimensions of artistic creativity performance (Creativity, Likeability, Appropriateness, Technical quality, Elaboration & Cultural integration level) than their counterparts in Guizhou (p value < 0.05). However, there were no significant differences in the dimensions of Imagination and Artistic levels between Guizhou and Macao's students (p value > 0.05). Results also indicated that age was an important factor in artistic creativity, i.e. the longer students have been exposed to their own cultural environment, the higher the level of cultural integration their collage artwork showed. The study concluded that the length of cultural exposure significantly affected their artistic creativity performance. It is essential to understand these differences to develop strategies that support artistic creative development across different socio-cultural contexts.

Keywords

Creativity, Artistic, Socio-Cultural, Urban and Rural, Cultural Exposure

1. Introduction

1.1. Rationale of Research

Despite much research on creativity, the determining factors of creativity still

lack consensus. Some recent researchers have suggested that children's creativity is affected by different factors, such as culture (Tomassoni et al., 2018; Yi et al., 2013; Quek et al., 2008; Shao et al., 2019), political system (Gajda & Oie, 2017), religious belief (Liu et al., 2018), economic background and level of academic achievement (Anwar, Shamin-ur-Rasool, & Haq, 2012), individual's cognitive and development ability (Kapoula et al., 2016; Aliabadi et al., 2016), etc. In China, the economy has rocketed in the recent 20 years, yet in terms of resources and cultures, there exists a gauge between urban and rural areas. Hence it is important to understand the creativity development of students from a comparative perspective.

Of particular interest is the fact that the length of cultural exposure may also affect students' creativity (Kharkhurin, 2008). A comparative study by Neldner et al. (2019) also noted that children, aged 9 and above, were better than children below age 5 at innovation tasks. Such results might imply that the length of exposure to cultural influences affects people's perception of creativity and creative expression. Leung et al. (2008) also suggested that creativity can be enhanced when people are exposed to multiple cultures, the creative performance resulting from cultural exposure might depend on the individual's level of acceptance of the culture.

Elsewhere, researchers have explored the extent to which culture influenced the implicit theories of creativity of American and Singaporean laypeople, and ethnic minorities (Ramos & Puccio, 2014). Other kinds of comparative studies examined students' creativity from the social stratum perspective. For example, some scholars had compared the creativity of students from Pakistan's urban towns, which was higher than that of students from the countryside, implying that the creative ability of secondary students with sufficient learning resources was higher than the creativity of students who lacked such resources (Anwar, Shamin-ur-Rasool, & Haq, 2012). Results showed that children from urban areas were exposed to various resources with multiple experiences that might contribute to the formation of creative ideas (Köster, Yovsi, & Kärtner, 2020).

Furthermore, in recent years, the popularity of multiculturalism has led to studies to identify the significant cultural differences in various regions of the same country (Minkov & Hofstede, 2012). However, relatively few comparative research articles focused on studying students from different economic regions of the same country and their artistic creativity performance. But Xiong (2012) sets an example. The study was based on Wang's (2003) suggestion of comparing two regions within the same country as the results would provide comparative values. Xiong reported on a comparative study which demonstrated that the 12 to 14-year-old Miao (an ethnic minority group usually live in poor rural areas in China) teenagers exhibited lower artistic creativity performance than the Han (a majority ethnic group who primarily reside in urban areas in China) teenagers. It exemplified that even within a culture, there could be disparate or even "layered" cultural aspects influencing children's creative performance. The current study

compared creativity performance of children in two very different regions (i.e. in terms of the availability of educational resources, ethnicity, history, society, and culture) within the same country, namely students in Macao and the rural region of Guizhou. As Wang (2003) suggested, a considerable difference in the target groups of this study would make the comparison more valuable. Adopting the Consensual Assessment Technique (CAT) scale, children's artistic creative performance in the two places were examined in terms of the different dimensions of artistic performance and the extent to which local artistic and cultural characteristics have influenced them. Macao was formerly a Portuguese colony and is now a special administrative region of China. The participants in Macao have been strongly influenced by Chinese and Portuguese cultures. Participants from the Miao and Dong Autonomous Prefecture of Guizhou Province in Southeast China have been influenced by Chinese and minority cultures, with the Miao predominating. On the other hand, Macao SAR is one of the world's wealthiest places, an urban city in China. In 2020, Macao ranked second in China, with a per capita GDP of 35,615 U.S. dollars (International Monetary Fund (IMF), 2021). However, the GDP Per Capita of Macao was over three times higher than that of Guizhou (a per capita GDP of 10,441 U.S. dollars) (Bureau of Statistics of Guiyang, 2021). It can be seen that the overall living consumption level of Macao residents is higher than that of Guizhou residents, with a significant economic gap. Macao and Guizhou were chosen as comparators in this study because of the significant differences in their social structures and economic gap.

1.2. Research Objectives

There are limited studies about young children's perceived artistic creativity performance (Lu et al., 2023), living in disparate environments and different cultural characteristics. This study compared the artistic performance of 4 to 8 years old children Han children in Macao and Miao children in Guizhou of China, and examined for cultural similarities and differences in children's artistic creativity performance in the two cultural contexts.

The first objective of this research is to understand whether there were influences of the minority culture on Miao children's artistic performance and influences of the Portuguese culture on children of Macao. So we set out to identify the characteristics of the artistic creativity performance of children in Guizhou and Macao through the Consensual Assessment Technique (CAT) scale. As mentioned in Kluckhohn-Strodtbeck's Values Orientation theory, people are influenced by the values of the cultures they have been exposed to.

The second objective of this study is to verify whether the longer the students were exposed to culture, the better their artistic creativity was. Previous studies compared the creativity of college and secondary school students from other age groups and countries. They supplied different explanations under the influence of different cultures and socioeconomic environments, but the results did not reach a consensus (Tomassoni et al., 2018; Niu, 2006; Zhang et al., 2020;

Quek et al., 2008; Melati et al., 2018; Yi et al., 2013; Huang et al., 2018; Gajda & Oie, 2017; Anwar, Shamin-ur-Rasool, & Haq, 2012; Ivancovsky et al., 2018). Hence, this research further explored the artistic creativity performance of children under different cultural contexts in terms of whether the local art cultural features characterized their artworks. This study argued that the length of cultural exposure might impact young children's creativity. Our hypotheses were as follows:

Hypothesis 1: Macao students scored higher on all dimensions of artistic creativity performance than their counterparts in Guizhou.

Hypothesis 2: The longer students are exposed to cultural influences, the greater their artistic creativity.

1.3. Significance of the Study

In terms of significance, this study could enrich knowledge in the field of creativity research, with regard to the possible value-ladened cultural influence on children's artistic creativity. Practically speaking, the results would be helpful for the respective policymakers to understand the essential elements of cultivating children's artistic creativity, and increasing the effective allocation of educational resources. At the same time, it could help readers better understand children's artistic creativity in different areas of China as affected by their respective socio-cultural contexts.

2. Conceptual Framework

2.1. Various Factors of Artistic Creativity Performances

Early on, Zhou et al. (1995) used figural creative thinking (FGA tests) to test Chinese and German children in grades 5 and 7 for three consecutive years. They found that both regular and gifted Chinese children were higher than German children in generative thinking. But the progression of German children was better than Chinese children over the three years. Students' artistic creativity performance may also be affected by age. Baer (1996)'s study compared the artistic creativity performance of kindergarten and primary students (grades 3, 4, and 5) through a collage-making task with the Consensual Assessment Technique (CAT) 5-point scale. The results showed that primary students had higher artistic creativity than kindergarten students and indicated that students' artistic creativity performance did not decline with age. Yi et al. (2013) suggested that students' cultural and bilingual backgrounds impact their artistic creativity performance. They compared the artistic creativity performance of German and Chinese university students through a collage and drawing task, which was scored by Amabile's 7-point scale, the Consensual Assessment Technique (CAT). The results showed that university students from German cultural backgrounds performed better than those from Chinese cultural backgrounds in artistic creativity; hence, cultural differences can affect people's artistic creativity performance. However, their study also showed that students from bicultural or bilingual

backgrounds were not more creative than students from only one cultural or linguistic background.

In terms of socio-economic differences, some researchers found that the creative thinking abilities of secondary students from urban areas were better than those from rural areas (Anwar, Shamin-ur-Rasool, & Haq, 2012). The technology-rich environment fostered and supported students' self-direct learning and provided the structure of innovative thinking for students (Mishra et al., 2013). However, Tomassoni et al. (2018) showed that the creativity performance of students from poor areas was not worse than those of students from affluent areas, and their creativity performance was even higher than those of students from affluent areas. Melati et al. (2018) also found that those students from low economic backgrounds' creativity scores in visual arts were higher than students from middle-up economic backgrounds. Meanwhile, college students from low-income families had higher creative achievements than wealthy families. It implied that college students lacking learning resources have higher creative achievements than those with sufficient learning resources (Melati et al., 2018). Such studies showed that in contrast to people's common sense, the creativity of students living in a learning environment with limited resources might not be worse than that of students living in a learning environment with more resources. People's artistic creativity performances vary in different social and cultural contexts. There is no consensus and the results seem mixed and need further research.

2.2. Values Orientation Theory

Culture is an environmental element affecting creativity; it also affects the level of creativity, the definition of creativity and the evaluation of creativity, and even the process of creation or the way of creation (Sternberg & Lubart, 1996). Kasof et al. (2007) verified that personal values could facilitate and inhibit creative performance, and it also depends on the mode of personal values. However, the expression of creativity is a typically individual phenomenon deeply influenced by culture, having a long-term impact on culture (Rudowicz, 2003).

The Kluckhohn-Strodtbeck Values Orientation theory can be used to explain the influence of multiculturalism on values reflected by people's works of art. This theory is one of the foundations for the development of cross-cultural value theory; this framework is useful in understanding multi-cultures around the world (Weinland, 2023). Kluckhohn and Strodtbeck (1961) proposed that people would produce different solutions when they encountered various problems, and the production of such solutions would be affected by the socio-cultural environment, i.e., the choice of which solution to use is affected by their values. Therefore, when different cultural backgrounds influence a person, his values are also relatively affected. According to this perspective, values also influence the understanding of creativity. This research adopted Kluckhohn-Strodtbeck's Values Orientation theory to explore whether the young children were affected

by the values they had been exposed to, which might have led them to create artworks with the characteristics of their local artistic works.

3. Cultural Background and Artistic Characteristics: Macao & Guizhou

Macao, formerly a Portuguese colony, is now one of the Special Administrative Regions of the PRC. Macao inherited the capitalist economic system from the Portuguese but is now governed by the policy of "one nation, two systems" (Wang, 2010). Despite a small Portuguese population remaining, most of the Cantonese and Fujianese living in Macao are of Han nationality (Liao, 1998). In terms of culture and language, Macao residents are from different nationalities, races, and have different religious beliefs, etc., forming the characteristic of Macao's cultural diversity (Wang, 2010). However, Wang (2010) mentioned that traditional Confucian culture influenced Macao people's thoughts.

Macao's artworks are primarily documentary-oriented, with a good combination of Chinese and Western techniques. Artworks are documentary-oriented in the sense that most artworks originate from real emotions and understanding, a record of real life and things (Li & Zhou, 2022). Macao's public art images include traditional religious architecture and sculpture, cemetery sculptures, and new and quirky contemporary sculptures and architecture (Shao, 2016).

Meanwhile, Guizhou has always been part of the PRC and is home for various minorities with diverse ethnic cultures and significant regional differences (Zhou, 2014). Therefore, Guizhou is one of the regions under socialism with a Chinese characteristic system. There are 46 ethnic groups living in the territory of Miao and Dong Autonomous Prefecture of Qiandongnan, including Miao, Dong, Han, Buyi, Shui, and so on. Miao and Dong Autonomous Prefecture of Qiandongnan have diverse ethnic cultures and rich cultural heritage. Therefore, the ethnic cultures are very rich in Guizhou, including that of the Qiandongnan Prefecture, which has recently been emphasizing the promotion of ethnic culture education by integrating ethnic culture into classrooms and strengthening the protection and inheritance of ethnic culture (Education Bureau of Qiandongnan, 2021).

Miao and Dong's traditional art patterns have strong color contrasts and a wide variety of craft techniques. Regarding the origin of Miao and Dong's ancestors' pattern creation, there are two main sources of their traditional patterns. One is the worship of nature and the record of real life. The ancestors believe that everything has spirituality. This mode of thinking makes the Miao people often use exaggerated and imaginative techniques to draw natural plants and animals to create patterns. The second is from the ancient ancestor worship and totem worship ideas. Based on mythology and national historical memory, the patterns created are given a mythical color, showing the extraordinary imagination and creativity of the mi people (Zhang, Zhou, & Sun, 2021; Cai, 2004).

4. Methodology

4.1. Research Method

This study took a quantitative research approach by adopting the Consensual Assessment Technique (CAT) to analyze the story-prompted collages produced by young children in terms of the dimensions of creativity as defined by the CAT.

4.2. Participants

This study involved two groups of 132 children, one from Guizhou (N = 60) and the other from Macao (N = 72) between the ages of 4 and 8 from four kindergartens and four elementary schools in Macao and equal numbers from Qiandongnan rural areas in Guizhou. In both Macao and Guizhou, children study in kindergartens at about 4 to 5 years of age, and attend primary schools at about 6 to 8 years of age. Nine to fifteen students were chosen as a group from each kindergarten or elementary school from different grades (at least three students per age group) for this experimental task. All participants were Chinese natives; all Macao participants were Cantonese speakers, and all Guizhou participants were Mandarin speakers.

4.3. Procedures

The first author is a female native Chinese who can speak Mandarin and Cantonese fluently and conducted the collage-making tasks and observed the whole process. The content of the instruments received by all participants was in Chinese. The language of communication between the researcher and the Guizhou participants was Mandarin, while Cantonese was used for the Macao participants. All participants' information was anonymously processed and identified by number. The research used a convenient sampling method. The kindergartens and schools contacted randomly selected students of the appropriate age group and assisted in distributing and collecting parent consent forms given to the parents. Informed consent was obtained from students via signed forms or verbal agreement before the start of the creative task. The students would be asked to create a collage based on a story about a waterdrop's adventure. Three judges were invited to rate the artworks using the Assessment Tool—The Consensual Assessment Technique (CAT).

Assessment Tool— The Consensual Assessment Technique (*CAT*)

The Consensual Assessment Technique (CAT) was initially suggested by Teresa Amabile and verified by other researchers. This technique has been widely used for measuring and judging the creativity of artworks by combined judgments of human experts in a specific domain (Baer & McKool, 2009). A 7-point Likert-type scale was used to score all artworks (with 1 being the lowest and 7 being the highest), and eight dimensions of collage artworks would be scored. As this study explored whether artworks were influenced by local culture, the

dimensions of the Consensual Assessment Technique (CAT) were adjusted. After the first author discussed with all judges, one of the CAT scale's dimensions—"General Impression" was changed to "Cultural integration level" to suit the current study. The "Cultural integration level" dimension could measure the degree of integration of artworks with local culture. Therefore, the collage works would be evaluated according to the following eight dimensions:

1) Creativity (the creative level of the artwork);

2) Likeability (the level of likeability of the artwork);

3) Appropriateness (the extent to which the artwork fits the topic);

4) Technical quality (The quality of the creative technique of artworks);

5) Imagination (the level of the creator's imagination);

6) Artistic level (the level of artistry of the artwork);

7) Elaboration (the level of elaboration of the artwork) (Yi et al., 2013);

8) Cultural integration level (the degree of integration between the work and the local culture).

Requirements and standards for Judges

In previous research, judges used the Consensual Assessment Technique (CAT) to rate students' artworks (Baer, 1996; Yi et al., 2013), and different requirements and criteria for selecting judges had been used. For example, Yi et al. (2013) invited judges to rate all student's artworks (collage making & alien drawing from German and Chinese students) using the Consensual Assessment Technique (CAT). Next, the researchers applied the Cronbach's coefficient alpha to measure inter-judge reliabilities and confirmed that all reliability coefficients were acceptable even if most values were above 0.7, implying that the judges did not prefer artworks from their own culture to other cultures. The CAT has been widely used in a variety of creativity research. Based on available evidence, formed judgments were typically reliable and valid (Hennessey, Amabile, & Mueller, 2011). Due to the above criteria and requirements for selecting judges by different scholars, this study chose judges with artistic backgrounds and a certain number of years of experience to rate the collage artworks of the students. The three artists included one local Macao artist who was familiar with Portuguese culture and artistic features, one artist who used to live in Guizhou and was familiar with Guizhou culture and artistic features (migrated to Macao from the mainland in 2013), and one Macao artist (migrated to Macao from the mainland in 2003) with a background in Chinese and Macao visual art styles and features. This article also employed the Cronbach's coefficient alpha to check whether the judges tended to prefer works rooted in the culture that they are familiar with. The three judges were asked to rate each artwork (collage-making & alien drawing) on a seven-point scale, ranging from 1—very low to 7—very high (Yi et al., 2013).

4.4. Materials

Amabile and Gitomer (1984) explained that children who had the choice of ma-

terials when making collages were more creative than those who had no choice of materials. Besides, materials-using, creative thinking, and feeling in artworks were involved in the creative process (Glăveanu, 2018). Therefore, this study provided students with a wide range of life-living materials to help them develop their collages. Materials included small stones, branches, leaves, glue sticks, scotch tape, double-sided tape, scissors, playdough, A4 (8.3 × 11.7 inches) colored cardboard, A3 (11.7 × 16.5 inches) colored cardboard, colored gauze, pencils, colored pens, crayons, and handicraft wires.

4.5. On-Site Procedures

Each time, a small group of participants (between 5 and 15 students) would be invited to a classroom. Participants completed a collage according to the following story and instructions. Before they began their collage-making, the researcher would read aloud a story: *A New Home of the Little Waterdrop*. This story was created by the second author and a university art teacher and used as the theme for the collage-making task. The story was used to create neutral positions in the perception of the story by the students in both places. Elements of nature such as water, rain, the ground, the side of the road, or the field, were the key features in the story. It also provided the children with directions and ideas for their creations, in particular, the students were encouraged to design a new home for the water drop, allowing for the integration of the local culture and using the home as a starting point.

"A New Home for the Little Waterdrop"

My name is little waterdrop, I am not happy.
When it rains, I will fall onto the ground, on the roadside of the road, or in the fields. When adults and children are thirsty, they poured me into their stomachs. Sometimes adults will use me to water the flowers, I can only lie in the pot. And many people flush me into the toilets,
I don't like those places, I hope to have a new home.
Kids, can you give me a special new home?

The Chinese version of the story is presented as follows:

『小水滴的新家』
我的名字叫小水滴，我有一點不開心
下雨的時候，我落在地面上、路邊或田野裡
大人小孩渴的時候，我被喝到肚子裡
有時候大人用我來澆花，我只能躺在花盆裡
還有很多人把我沖到馬桶裡
那些地方，我都不喜歡
我很希望有一個新的家
小朋友，你可以給我一個很特別的新家嗎?

After being told the story, materials were made available for the children. The

instruction for participants to design their collage was: "*Please create a new home for the little waterdrop. You have* 30 *minutes to complete the task*".

4.6. Judging Process

First, all the artworks from the Macao and Guizhou participants were collected and converted into photos and video files. All the students' design ideas for each picture were captured and made known to the judges. The names of the schools and students were anonymized. The researcher told the judges that the artworks had been categorized by the regions of Macao and Guizhou, respectively. Then the judges would judge all artworks for the eight dimensions on the amended Consensual Assessment Technique (CAT) form. Each judge needed to evaluate the collage-making artworks in a pre-set order, and judges could write down any comments if necessary.

4.7. Method for Data Analysis

Before analyzing all research data, inter-judge reliabilities should be verified by Cronbach's coefficient alpha standardized with SPSS 13.0. After confirming that the data were reliable and valid, we verified the reliability coefficients between each judge and each dimension. After confirming that the data were credible and valid, we proved the reliability coefficients between each judge and each dimension. A T-Test was used to analyze the data from the CAT scale and determine if there was a significant difference between the means of Guizhou and Macao students' artistic creative performance and how they were related. Pearson correlation coefficient was used to find the correlation between the eight dimensions of the CAT scale. Then we compared the mean of each judge's ratings of artworks from the two regions and grades on each dimension to indicate the performance level of each group of children on CAT dimensions and to identify their characteristics.

5. Results

We first addressed hypothesis 1: Macao students scored higher on all dimensions of artistic creativity performance than their counterparts in Guizhou. The overall artistic creativity performance of the participants in Macao and Guizhou was analyzed. Cronbach's alpha is a coefficient of dependability (or consistency). Cronbach's coefficient alpha is a metric for internal consistency, or how closely a group of variables is related. It is regarded as a scale reliability indicator (Streiner, 2003). The internal consistency of all dimensions of the CAT evaluation form for each group of judges by Cronbach's coefficient alpha with SPSS 13.0 (**Table 1**) was first measured. All the reliability coefficients of the three judges were acceptable (all reliability scores were above 0.70). In each dimension of the CAT evaluation form, inter-rater reliability was used to calculate the percentage of items on which the judges agreed (**Table 2**). All dimensions' inter-rater agreements were on or above 75%, which was considered reliable.

Table 1. Cronbach's Alpha of each judge for all dimensions in experiments of collage making.

	Judge 1	Judge 2	Judge 3
Cronbach's Alpha	0.70	0.71	0.72

Table 2. Interrater reliabilities among judges of different dimensions of experiments of collage making.

	Crea	Like	Appr	Tech	Imag	Arti	Elab	Cult
Judges (1, 2, &3)	0.75	0.75	0.80	0.91	0.77	0.78	0.77	0.79

Note. The numbers indicate the reliabilities of the judges on each dimension. Crea = creativity; Like = likeability; Appr = appropriateness; Tech = technical quality; Imag = imagination; Arti = artistic level; Elab = elaboration; Cult = cultural integration level.

5.1. Macao Children Outperformed Guizhou Children in the Overall Artistic Creativity Performance

Consensual Assessment Techique (CAT)	Guizhou	Macao
Mean	3.75208	4.09838
Variance	0.03926	0.03724
P (T < −t) two-tail	0.00326	
t Critical two tail	2.14479	

The T-test was used to analyze the scores of the eight dimensions of the Consensual Assessment Technique (CAT) scale of Macao and Guizhou, which showed a significant relationship between the scores of Guizhou and Macao ($p < 0.05$). Comparing the mean between the two groups demonstrated that the artistic creativity of Macao students was higher than that of Guizhou students. **Table 3** showed the correlation coefficients between eight dimensions in the CAT scale. The correlation coefficient $|r| = 0.416$ for Likeability and Creativity ($0.4 < |r| < 0.7$

Table 3. Correlation coefficient between eight dimensions of CAT scale.

	Creativity	Likeability	Appropriateness	Technical quality	Imagination	Artistic level	Elabration	Cultural integration level
Creativity	1							
Likeability	0.416120754	1						
Appropriateness	0.3435946	0.306111965	1					
Technical quality	0.351859896	0.355096948	0.375576544	1				
Imagination	0.326266436	0.189583136	0.296768435	0.267664608	1			
Artistic level	0.299011545	0.208859342	0.120516432	0.224225616	0.291879472	1		
Elabration	0.229468888	0.177951006	0.168829195	0.223020993	0.230210711	0.188033386	1	
Cultural integration level	0.117406218	0.110409974	0.205355022	0.254145441	0.351888928	0.205212299	0.376211094	1

is a significant correlation). Although it was only 0.4 points higher, it was still a significant correlation. The correlation coefficient between the other dimensions $|r| < 0.4$ was a low linear correlation. In particular, the adjusted eighth dimension, Cultural integration level, also had a low linear correlation ($|r| < 0.4$) with the other seven dimensions. The modified CAT scale had a certain degree of feasibility for all eight sizes. This result confirmed hypothesis 1 in that Macao students scored higher on all dimensions of artistic creativity performance than their counterparts in Guizhou.

5.2. Comparison of Guizhou & Macao Students' Artistic Creativity Performance by Each Dimension of CAT

Table 4 and Table 5 would be used to compare students' performance at Guizhou Kindergarten, Guizhou Primary School, Macao Kindergarten, and Macao Primary School on eight dimensions of artistic creativity. The results of each of the eight dimensions were explained as below.

Table 4. Comparison of artistic creativity performance of guizhou and macao participants' artwork in collage making.

	Kindergarten students of Guizhou	Kindergarten students of Macao	Primary students of Guizhou	Primary students of Macao
Creativity	3.81	4.47	4.32	4.49
Likeability	3.66	3.93	3.57	4.17
Appropriateness	3.68	4.16	3.85	4.18
Technical quality	3.58	4.36	3.72	4.07
Imagination	3.71	3.85	3.99	4.16
Artistic level	3.89	4.08	3.99	3.93
Elabration	3.61	3.95	3.51	3.84
Cultural integration level	3.49	3.87	3.54	3.99

Table 5. Comparison of the mean scores of artistic creativity performance of Guizhou and Macao participants' artworks in the experiment of collage making.

	Mean of All Guizhou students	Mean of All Macao students
Creativity	4.06	4.48
Likeability	3.62	4.03
Appropriateness	3.76	4.17
Technical Quality	3.65	4.25
Imagination	3.84	3.98
Artistic level	3.94	4.02
Elaboration	3.56	3.90
Cultural integration level	3.52	3.92

5.2.1. Creativity

Creativity	Guizhou	Macao
Mean	4.0555556	4.4814815
Variance	0.9234149	0.6569292
P (T < −t) two-tail	0.0065640	
t Critical two tail	1.9783804	

The dimension of Creativity represents the creative level of the composition and the subjective definition of creativity. According to the Creativity dimension of the CAT scale, there was a significant difference between the Creativity scores of Macao and Guizhou students ($p < 0.05$). Macao students' works were rated higher than Guizhou students' in Creativity.

The comparison showed that Guizhou kindergarten students were the weakest in the "Creativity" dimension and got the lowest mean scores (3.81) among the four groups of students. The creativity scores of Guizhou primary students (4.32) were higher than those of Guizhou kindergarten students but still lower than those of Macao kindergarten and primary students. In terms of comments, one of the judges commented on the artwork of the Guizhou primary students as "wild imagination" and also gave the corresponding artwork a higher score. Besides, the creativity scores of Macao's primary students (4.49) were slightly higher than those of Macao's kindergarten students (4.47).

In general, primary students were better than kindergarten students in Creativity.

5.2.2. Likeability

Likeability	Guizhou	Macao
Mean	3.616666667	4.027777778
Variance	0.575612053	0.471830986
P (T < −t) two-tail	0.001400225	
t Critical two tail	1.978380405	

The dimension of Likeability represents the level that the artwork appeals to its audiences and subjective reaction to the composition. According to the Likeability dimension of the CAT scale, there was a significant difference between the Likeability scores of Macao and Guizhou students ($p < 0.05$). Macao students' collage works were rated higher than Guizhou students' in Likeability.

The artworks of Macao primary students received the highest score of 4.17 on the Likeability dimension, followed by the artworks of Macao kindergarten students with a score of 3.93. Guizhou primary students had the lowest Likeability among the four groups, scoring 3.57. This score was lower than the Likeability score of Guizhou kindergarten students' artworks (3.66).

Macao primary students were better than kindergarten students in the dimension of Likeability. But Guizhou kindergarten school students were better than primary students in Likeability.

5.2.3. Appropriateness

Appropriateness	Guizhou	Macao
Mean	3.761111111	4.166666667
Variance	0.670778406	0.638497653
P (T < −t) two-tail	0.004781839	
t Critical two tail	1.978380405	

The dimension of Appropriateness represents the extent to which the artwork fitted the topic. According to the Appropriateness dimension of the CAT scale, there was a significant difference between the Appropriateness scores of Macao and Guizhou students ($p < 0.05$). Macao students' collage works were rated higher than Guizhou students' in Appropriateness.

Guizhou kindergarten students scored 3.68 on the Appropriateness dimension, the lowest score among the four groups. Moreover, Guizhou primary students scored significantly higher than Guizhou kindergarten students, scoring 3.85. The scores of the Macao primary students (4.18) are slightly higher than kindergarten students (4.16); however, their scores were much higher than those of the kindergarten and primary students in Guizhou.

In general, primary students were better than kindergarten students in Appropriateness.

5.2.4. Technical Quality

Technical quality	Guizhou	Macao
Mean	3.65	4.24537037
Variance	0.800094162	0.644735698
P (T < −t) two-tail	9.53647E-05	
t Critical two tail	1.978380405	

The dimension of Technical Quality represented the degree to which the artworks are technically performed. According to the Technical Quality dimension of the CAT scale, there was a significant difference between the Technical Quality scores of Macao and Guizhou students ($p < 0.05$). Macao students' collage works were rated higher than Guizhou students' regarding Technical Quality.

Guizhou kindergarten students scored the lowest rating among the four groups in the Technical Quality dimension, at 3.58. Guizhou primary students also scored significantly higher than Guizhou kindergarten students, with a rating of 3.72. Macao kindergarten and primary students received higher scores than students from Guizhou. In particular, the score of Macao kindergarten students (4.36) for the Technical Quality dimension was the highest among the four groups, much higher than the score of Macao primary students (4.07).

In general, primary students were better than kindergarten students in Technical Quality.

5.2.5. Imagination

Imagination	Guizhou	Macao
Mean	3.916666667	4.027777778
Variance	1.120998117	0.63458529
P (T < −t) two-tail	0.493121822	
t Critical two-tail	1.978380405	

The dimension of Imagination represents the extent to which the creator's artwork contains new ideas and images. According to the Imagination dimension of the CAT scale, there was no significant difference between the Imagination scores of Macao and Guizhou students ($p > 0.05$). Even though the data demonstrated that Macao students scored higher than Guizhou students and primary students were better than kindergarten students in Imagination, this set of comparative data was not comparable.

5.2.6. Artistic Level

Artistic level	Guizhou	Macao
Mean	3.938888889	4.018518519
Variance	0.725015694	0.459746131
P (T < −t) two-tail	0.550822706	
t Critical two tail	1.978380405	

The dimension of the Artistic Level represents the degree to which the artworks exhibit artistic features. According to the Artistic level dimension of the CAT scale, there was no significant difference between the Artistic level scores of Macao and Guizhou students ($p > 0.05$). Hence, this set of comparative data was not comparable.

5.2.7. Elaboration

Elaboration	Guizhou	Macao
Mean	3.561111111	3.902777778
Variance	0.401098556	0.339397496
P (T < −t) two-tail	0.001595009	
t Critical two tail	1.978380405	

The dimension of Elaboration represents the level of complexity of the artworks. According to the Elaboration dimension of the CAT scale, there was a significant difference between the Elaboration scores of Macao and Guizhou students ($p < 0.05$). Macao students' works were rated higher than Guizhou students' works regarding Elaboration. Guizhou primary students scored 3.51, which was the lowest score. Guizhou kindergarten students (3.72) scored higher than Guizhou primary students. And Macao kindergarten students (3.95) scored higher than Macao primary students (3.84).

Kindergarten students were better than primary students in the dimension of Elaboration.

5.2.8. Cultural Integration Level

Cultural integration level	Guizhou	Macao
Mean	3.516666667	3.916666667
Variance	0.521374765	0.393583725
P (T < −t) two-tail	0.00087974	
t Critical two tail	1.978380405	

The dimension of the Cultural Integration level represented the degree of integration between the artwork and the local artistic elements.

According to the Cultural Integration level dimension of the CAT scale, there was a significant difference between the Cultural Integration level scores of Macao and Guizhou students ($p < 0.05$). Macao students' collage works were rated higher than Guizhou students' works regarding the Cultural Integration level. The group with the highest degree of cultural integration was the Macao primary students, with a rating of 3.99. However, the Macao kindergarten students' artworks received a rating of 3.87, a little lower than the Macao primary students' artwork. Even though the ratings of both primary and kindergarten students in Guizhou were lower, the rating of Guizhou kindergarten students (3.49) was still slightly lower than that of Guizhou primary students (3.54).

In general, primary students were better than kindergarten students in the dimension of Cultural Integration.

6. Discussion

The following sections will discuss the similarities and differences in the performance of artistic creativity in Macao and Guizhou. Firstly, as Anwar, Shamin-ur-Rasool, & Haq (2012) pointed out, creativity can be influenced by economic background. The results of the current study were discussed with the different resource levels in Macao and Guizhou (Tomassoni et al., 2018; Yi et al., 2013; Quek et al., 2008; Shao et al., 2019). The results show that the older the children are, the better their artistic creativity is. Inevitably, the older the children, the longer their exposure to the local culture. Thus, the effects of age and culture exposure on students' artistic creativity were discussed.

6.1. Economic and Educational Disparity Mattered in Children's Creativity Performance

The most obvious contribution factor between Macao and Guizhou was the economic disparity. De facto, Guizhou's financial expenditure on education reached 127.327 billion yuan in 2020 (compiled by the National Bureau of Statistics of China, 2020). Macao's financial expenditure on education in 2020 was 12.7 billion Macao patacas (Financial Services Bureau of Macao, 2021). Even though

Guizhou spent much more money on education than Macao, a simple calculation of per capita support for education showed a different result. Macao residents received about five times more funding per capita for education than Guizhou residents. Macao has invested sufficient funds and resources facilities in education and has set the direction of creative education development accordingly.

Even though the subjects were of different ages, this study's findings aligned with Köster, Yovsi, and Kärtner (2020) and Mishra et al. (2013), who concluded that children from urban areas are more creative than those from rural areas. Anwar, Shamin-ur-Rasool, & Haq (2012) also indicated that secondary school students with adequate learning resources tended to be more creative, with urban students being more creative than rural students. Consistented with Xiong's (2012) conclusion, the artistic creativity performance of Miao teenagers in rural areas was lower than that of Han teenagers in urban areas. But such finding differed from Tomassoni et al. (2018) and Melati et al. (2018), which stated that creativity performance of students from poor areas was higher than those of students from affluent areas.

The CAT scale was used to conduct a preliminary analysis of students' performance scores aged 4 - 8 in Guizhou and Macao. Based on the judges' nonbiased judgments, the judges rated the artworks of Macao students higher than those of Guizhou students in relation to the eight dimensions rated. The results of this study implied that the average artistic creativity performance of students aged 4 - 8 in Macao was higher than that of students in Guizhou.

It answered hypothesis 1 in that the different economic conditions influenced the performance of artistic creativity of children aged 4 - 8 in Macao and Guizhou, i.e., the more expenditure and resources for the development of students' artistic creativity, the better they perform in such areas, at least in terms of the perceived creativity performance (Vong et al., 2020). Macao students scored higher on all dimensions of artistic creativity performance than their counterparts in Guizhou.

6.2. Cultural and Age Disparity Mattered in Childrens Creativity Performance

It was not until 1999 that Macao was returned to China as a Special Administrative Region. The political, legal, and social aspects, as well as the linguistic, cultural, and religious aspects, have all left their marks on Macao, which was under Portuguese colonial rule. Regarding ethnicity or community, the people of Macao can be broadly categorized as Chinese, Portuguese, and Macanese, with most Chinese being Han Chinese (Li & Situ, 2001). The Macao students in this study were Han Chinese, and the Guizhou subjects were Miao Chinese. The results of this study using the Consensus Assessment Technique (CAT) assessment form showed that the artistic creativity of children aged 4-8 in Macao was higher than that of Guizhou in the dimensions of "Creativity", "Likeability", "Appropriateness", "Technical quality", "Elaboration", and "Cultural Integration Level". This

result of the CAT assessment supported the study by Xiong (2012), which indicated that the artistic creativity of Miao youths aged 12-14 was lower than that of Han youths.

On the other hand, primary students performed better than kindergarten students in the dimension of Creativity, Technical Quality of Guizhou, Likeability of Macao, Appropriateness, and Cultural Integration level. Still, younger students were not necessarily less creative than older students. In contrast, kindergarten students performed better than primary students in the "Technical Quality" dimension of Macao, Elaboration, and Likeability of Macao. The data from the current study is partially consistent with Neldner et al.'s findings. Neldner et al. (2019) suggested that children exposed to Western culture were more innovative; children's creative performance was influenced by age, with children aged 9 and above being better at creative tasks than those aged under 5. Moreover, this study is consistent with Baer's (1996) comparative conclusion using the Consensual Assessment Technique (CAT) 5-point scale that primary students had higher artistic creativity than kindergarten students. This study further confirms that students' artistic creativity increases with age. Furthermore, the results of the current study are consistent with Kluckhohn and Strodtbeck (1961)'s Values Orientation theory. The artworks of primary school and kindergarten students in Macao and Guizhou are to some extent biased and culturally specific to the local culture.

Generally, it addressed hypothesis 2 in that the longer students are exposed to cultural influences, the better their artistic creativity. We noted that Vong et al. (2020) indicated that age is a prominent predictor of creativity in young children, supporting the present data findings.

However, there was no significant difference in the performance of Macao and Guizhou students in the dimensions—"Imagination" and "Artistic level". We should be cautious to draw such conclusions as in the dimensions of "Imagination" and "Artistic level", Macao students did not outperform their Guizhou counterparts. The contributing factors to students' Imagination and Artistic dimensions should be further studied.

7. Conclusion, Limitations, Future Studies

7.1. Conclusion

The main objective of this study was to compare the artistic creativity performances of primary students aged 4 - 8 in Guizhou and Macao. In this study, the students were given various materials to create artwork, and the story was used as a backdrop for the students to create their artwork, which was then scored by a professional artist using the Assessment Tool—The Consensual Assessment Technique (CAT). Finally, the data obtained were used to effectively analyze the artistic creativity performance of students in Guizhou and Macao. It is worth noting that the judges in this study did not favor artworks from their region, which enhanced the validity of the results. In line with Kluckhohn-Strodtbeck's Values Orientation theory, students in Macao and Guizhou are influenced by

their local artistic culture to the extent that their artwork is characterized by local artistic characteristics. The comparative analysis revealed that the level of artistic creativity of Macao students was higher than that of Guizhou students. Even though local artistic characteristics influenced both Guizhou and Macao students' artworks, Macao students' artworks have more Macao artistic characteristics. To nurture students' artistic creativity, it is essential to have sufficient local funding to allow students to be exposed to a wider variety of arts and cultures in their lives so that they can broaden their understanding of creativity and incorporate local arts and culture as appropriate. Macao and Guizhou have made great efforts to provide a better economic environment to foster creativity and promote students' understanding of creativity. However, even though Guizhou has a strong sense of local cultural identity, it may not effectively enhance students' integration into the local culture without adequate government fundings. In conclusion, the funding of learning is essential in fostering students' creativity, which plays a vital role in promoting local art culture. Students from better economic backgrounds have a higher level of artistic creativity performance than their less well-off counterparts. The longer students are exposed to cultural influences, the greater their artistic creativity.

7.2. Limitations and Future Studies

There are some limitations in the current study. One limitation in this study was the applicability of the assessment tool. As each study has different requirements for the use of the scale, Amabile's (1982) Consensual Assessment Technique (CAT) may not be entirely appropriate for the current study and for assessing the extent to which children's artwork is integrated into the local culture. To address this limitation, the researcher and judges adapted Amabile's (1982) Consensual Assessment Technique (CAT) by replacing one of the original dimensions—"General impressions", with "Cultural integration level". Of course, future research could consider developing new assessment tools or adapting existing ones better to suit the needs of students in Guizhou and Macao. New assessment tools should be culturally sensitive and encourage creativity in various forms. Another limitation was the length for collage creation. Some students inevitably needed a lot of time to think before starting. In this study, students were given a limited time of 30 minutes to create. Future research should allow enough time on art creation to give students sufficient time to work and think.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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