CHAPTER 3
PILOT STUDY OF CROSS-CULTURAL ANALYSIS OF SPATIAL TREATMENT IN CHILDREN'S DRAWINGS

Purposes

The purpose of this study was to examine the relationship between national origin (U.S. and Japanese) and the universality and cultural and social influences in children's drawings.

In Spring, 1993, about 1000 drawings by children 8, 10, and 12 years old were examined. The sample included 175 drawings by native Japanese students attending a school in suburban Chicago which offers the Japanese national curriculum for Japanese children living temporarily in the U.S. due to their parents' employment; and 767 drawings by U.S. students from suburban Chicago and Urbana-Champaign, IL. Drawings depicted "My friends and me playing in the school yard," a theme investigated in earlier studies by Elliot Eisner (1967) and Golomb (1983). Drawings were classified according to Eisner's 14 spatial categories by three art educators (including myself) at the University of Illinois at Urbana-Champaign. Chi-Square was used to analyze the spatial similarities and differences found in the drawings.

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Method

Hypotheses

The hypotheses that guided the pilot study were as follows:

1. There are significant differences between the development of spatial treatment in drawings by U.S. students in suburban Chicago vs. students in Urbana-Champaign in second, fourth, and sixth grades based on Eisner's spatial categories.
2. There are significant differences between the development of spatial treatment in drawings by U.S. students in both suburban Chicago and Urbana-Champaign vs. Japanese students in suburban Chicago in second, fourth, and sixth grades based on Eisner's spatial categories.
3. There are significant differences between the development of spatial treatment in drawings by U.S. students in both suburban Chicago and Urbana-Champaign vs. Japanese students in suburban Chicago in second grade based on Eisner's spatial categories.
4. There are significant differences between the development of spatial treatment in drawings by U.S. students in both suburban Chicago and Urbana-Champaign vs. Japanese students in suburban Chicago in fourth grade based on Eisner's spatial categories.
5. There are significant differences between the development of spatial treatment in drawings by U.S. students in both suburban Chicago and Urbana-Champaign vs. Japanese students in suburban Chicago in sixth grade based on Eisner's spatial categories.

Procedures

"Me and my friends playing in the school yard" was offered as the drawing subject to each student. The apparatus and procedure is shown in the following. (For Japanese students, this procedure was implemented in Japanese by classroom teachers.)

Subject-matter: Me and my friends playing in the school yard
Materials:

- Drawing papers 12" x 18"
- Crayons (eight colors)
- Pencils and erasers

Instructions to the students:
All of you play with friends in the school yard before school or after school or at recess, I would like you to think now about the kind of things you do in the school yard. I would like you to make a crayon drawing of you and your friends playing in the school yard. You will have 30 minutes to complete your drawing. Do you have any question? (If questions are asked, do not provide additional information about the theme; simply repeat the instructions and get the students into the act of drawings as soon as possible.)
[Distribute materials]
Note to the Teacher:
1. After distributing materials, have each student print name, age, grade level, and male or female on the upper right hand corner of the back-side of the drawing paper.
2. Remind students to work independently. Again, advise students that they have 30 minutes to complete their drawings.
3. Ask students to begin. After approximately 30 minutes have expired collect the drawings.

Samples

In Spring, 1993, 1425 drawings were collected from U.S. children from first to sixth grades and Japanese children in second, fourth, and six grades. For the U.S. data, 1250 drawings were collected in two different areas in the state of Illinois: 825 drawings in Urbana-Champaign schools, and 425 drawings from suburban Chicago schools from 1st through 6th grades in elementary schools. However, to compare with Japanese students drawings collected from only second, fourth, and sixth grades, 767 drawings were randomly selected from 2nd, 4th, and 6th grades students of the two areas. For the Japanese data, 175 drawings were collected from Japanese Saturday Schools in suburban Chicago.

Measurement

Collected drawings were categorized into a scale of spatial order by three staff members (including myself) under the supervision of Dr. George W. Hardiman at University of Illinois at Urbana-Champaign. At that time, the priority for analyzing data was to find a baseline of category in a spatial order to classify children's drawings to compare two populations objectively. As a baseline, the fourteen categories of spatial treatment formed by Elliot W. Eisner in 1967 in his research, "A Comparison of the Developmental Drawing: Characteristics of Culturally Advantaged and Culturally Disadvantaged Children," were used (See Figure 1). This scale was constructed for

classifying children's drawing with respect to spatial and is often used as an objective measurement to judge spatial order and artistic development as an objective measurement (Eisner, 1972; Stansfield, 1979). Due to Eisner's assumption in research, his visual-verbal categories were selected as my study's baseline. Although these categories were developed to compare the drawing performance of culturally advantaged and culturally disadvantaged children (which was different from my study) it proved useful. Eisner says in his article: "One major assumption of the study was not only that the various morphemes found in each category were present in children's drawings, but that the categories were ordered hierarchically. That is, the scale was not viewed merely as a scheme for classifying drawings but as a progression of category ordered according to development" (p.13).

Secondly, the statistical method (Chi-Square) was used to analyze the spatial similarities and differences in children's artistic development found in the drawings.

Results

First, based on Eisner's constructed categories, the relationship of nationality and artistic development, specifically spatial development, was examined. Second, the universality of spatial treatment in the drawings was observed. Finally, we examined differences in the scale or the transition pattern from one category to another between U.S. and Japanese students, and speculated upon the reasons for this.

Using the Chi-Square analysis (< .05 and .01), there were significant differences of spatial representation between children of different nationalities (See Table 4, 5, and Figure 3). In the first hypothesis, the difference between U.S. students in suburban Chicago and Urbana-Champaign in second, fourth, and sixth grades was significant, although the difference between them was not as great as the difference between different nationalities (See Figure 2). This indicated that, even in the same country, there is some difference in the process of children's artistic development depending on the cultural and education level. In hypotheses 2 to 5, which concerned the relationship between U.S. students (including both suburban Chicago and Urbana-Champaign) and native Japanese students (in suburban Chicago in each grade, second, fourth, and sixth), significant differences were found in the process of their spatial treatment. In addition, there are some interesting findings from the data in the rate of change in each category (See Figure, 4, 5, and 6). First, according to the category in which the range of numbers from low to high indicated artistic development in spatial order, there are few Japanese students in the lowest categories, 1 and 2, even among second grade students (compared with both groups of U.S. students in Chicago and Urbana-Champaign). Conversely, about ten percent of U.S. students in 4th and 6th grades are still in the first category in which figures are presented as "floating" in the space of drawing. In addition, the speed of transition from the lower categories to the higher categories is seemingly faster in Japanese students than in either group of U.S. students. In the fourth grade more than sixty percent of Japanese students already reach the higher categories from eleven to thirteen (figure presented as overlapping in horizontal space) and fourteen (advanced drawings which are not classified into the first to thirteenth categories) although fewer than twenty percent of U.S. children's drawings were placed in those categories.

Another finding is that many drawings by Japanese students were not classifiable in any of the 13 categories described by Eisner. In spite of the fact that most U.S. students

(more than ninety percent) can be classified into these 13 categories, about fifty percent of Japanese students in the sixth grade do not fit well into any of Eisner's 13 categories, which means that only fifty percent of drawings can be classified into the spatial categories. The reason will be discussed in the next page.

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Discussion

According to the results of the Chi-Square, all five hypotheses were overturned. The difference between U.S. and Japanese children in the process of spatial treatment was shown to be significant. Even between groups of U.S. children from suburban Chicago and Urbana-Champaign, IL, the results were significant, although the difference between them was not as great as the difference between children of different nationalities (See Table 4 and 5).

First, how should the differences in the spatial treatment between two regions in the U.S. be interpreted? One reason for the differences between U.S. children may be that American schools are so culturally heterogeneous. In addition, whether an art curriculum is adopted as either a required or a elective course depends on each district in the U.S. For example, in this study, although the required art curriculum was adopted in suburban Chicago schools, it was not adopted in schools in Champaign, IL. As Eisner's experiment based on the culturally advantaged and disadvantaged children indicated in 1967, the differences in the education level in each area dominates children's cognitive development, and this leads to the differences in the children's artistic development.

Secondly, how should the differences in the spatial treatment between nationalities be interpreted? Do Japanese children have fundamentally higher knowledge and skills that U.S. children? Are Japanese children more artistic than U.S. children? The answer could be "No." There are some other explanations of the results. One possible reason comes from the different art education systems rather than nationalities. In the U.S., art class is often an elective, which means that all students are not necessarily studying art in elementary school. Also, depending on each state and even each district, the manner of how to teach art differs greatly. This could cause a difference in the progression of artistic development between students enrolled and those not enrolled in art courses, as well as the regional differences between those schools which require art courses. Conversely, art is a required subject in Japan under the nationwide curriculum from first to ninth grades, which means all Japanese students have to study art in their elementary and middle schools based on a nationwide art curriculum.

Another reason for the differences between U.S. and Japanese students is the national differences in kindergarten. In Japan, kindergarten teachers are well trained as music and art experts. A lot of time is spent teaching art and music in the classroom. As a result, many children are exposed to art education and socialization with peers before going to the compulsory educational system (See, for example, Lewis, 1995; Peak, 1991; Tobin, Wu, & Davidson, 1989). Due to the differences in the educational system in the U.S. and Japan, my assumption is that Japanese children will progress faster than U.S. children in each category of development. At the same time, these results show that art educational programs help to contribute to the progression of children's artistic development. When children struggle to transfer three dimensional space onto a two

dimensional flat surface, they may be able to find a solution through art education and peer influence in the classroom.

Another reason may be the difference of language. Psychologists Harold W. Stevenson and James W. Stigler mention in their book, The Learning Gap (1992), that the Japanese and Chinese languages are more systematic than English, especially in "counting." Therefore, Japanese and Chinese children are apt to learn mathematics more quickly and easily than U.S. children. Although Stevenson and Sigler use the language differences to explain the difference of the development of mathematic skills related to cognitive development, the effect of a systematic language might allow us to explain differences in artistic development between U.S. and Japanese children. Vygotsky (1978) also says that the development of verbal language (speech) helps in the development of the thinking process. Furthermore, Pickard (1996) described differences of thinking processes between phonetic (English) and logographic languages (Chinese and Japanese). According to Pickard's research, in the process of visualization through verbalization, children who use logographic languages in the thinking process are faster than children who use phonetic languages at early ages. The reason is that, for example, a syllable often corresponds to a sound in logographic languages (Japanese and Chinese), but not in a phonetic language (English). As a result, native English speaking children first have to confirm what the word indicates when children hear the particular word; it is not easy for native English speaking children to visualize the word in their mind. It is said that Japanese has about one hundred sounds for fifty syllables; American English has more than two thousands sounds for twenty six letters of the alphabet due to the various combinations (Taylor & Taylor, 1983). Thus, we can assume that the thinking processes differ depending on what language you use when you speak and write and the different thinking processes can be used to explain the differences in artistic development. Vygotsky (1978) also says that language development helps in the development of cognition and perception in early childhood education. Japanese children already have an opportunity to develop their language skills through peer dialogue in the classroom since preschool is more universal in Japan. This language development might also help their artistic development.

Finally, Eisner's categories were originally developed based on the relationship between figures and baseline, and the existence of occlusion in spatial treatment. He classified spatial treatment into thirteen different categories depending on the progression and then created a fourteenth category for unclassifiable drawings, those that did not fit in the other thirteen categories. Category fourteen of unclassifiable drawings does not necessarily contain more sophisticated drawings than categories one through thirteen, although many of them may show advanced techniques in spatial treatment. While we found many unclassifiable drawings in Japanese students, most U.S. students' drawings were classifiable within the thirteen categories. Unclassifiable drawings in Japanese children were further divided into three types, an exaggerated view, a bird's-eye view, and the number of usage of perspective view. How should we interpret these results? The main reason for the Japanese children's unclassifiable drawings is apparently cultural and social influences.

Cultural and social influences appear strongly in the exaggerated and perspective views. It is well known that Japanese culture is strongly influenced by the "cartoon," so-called "Manga" in Japanese. However, the influence of cartoons in comic books

dominates Japanese society (especially children's society) more than most people think. Sometimes educational books also use cartoons, and these books effectively support education. Unlike in the U.S., in Japanese society cartoons are not just used in comic books. One of the characteristics of Japanese cartoons is the depiction of the background, in which the negative shapes (including architecture and landscapes) are depicted in aerial and lineal perspectives. Also, another characteristic of expression in cartoons is the exaggeration method, in which one part of the body or a place in the composition is exaggerated by excluding other parts. Likewise, it is easy to imagine that most Japanese children are influenced by these techniques in creating space in limited composition through cartoons (Wilson, 1988,1996). In addition, there is a flood of graphic and artistic advertisement throughout Japan, since Japan does not have a control system to regulate advertisements in the public space, unlike the U.S. As a result, people are unconsciously surrounded and visually influenced by the graphic advertisement (Schist, 1983).

The other unclassified type of drawing is the so-called "bird's eye view" drawing, which is a view that a bird looking straight down from sky would have. Because of the title of the drawing, "Me and my friends playing in the school yard," children might have to create a new way to show the playground view with friends. One reason that Japanese children create drawings this way is the influence of technology, TV and computer games. It might suggest that children are watching sports game on TV. As a result, they can easily see playground scenes with the bird's eye view through the TV screen. However, another question arises: Why don't U.S. children use the same method, since they are also exposed to technology like TV? In the U.S. students' drawings there are few bird's-eye view depiction of space. Another possible reason why Japanese children often draw with bird's-eye views is the influence of the traditional Japanese method of depicting space in painting. It is well known in art history that traditional Japanese artists used so-called "bird's-eye views" as early as the seventeenth century. Is it possible for Japanese children to be influenced by the traditional method of creating space in their drawings? The answer is probably "Yes." This influence could be acknowledged as an indirect contribution of Japanese aesthetics in the way that "high art" influences advertising and popular art which mediate the fine art aesthetic to the public. Although there is little possibility of children being exposed to such traditional methods today, the traditional methods in Japan still seem to indirectly contribute to the phenomenon of Japanese children's creativity.

Japanese children's aesthetic for the spatial arrangement in the drawing could explain their creativity. We have to recall that this subject, "Me and my friends playing in the school yard," was not drawn through direct observation but rather from memory and depicted in the classroom with limited time (about 30 minutes). When the subject was given, children recalled the playground scene with friends from memory and created the spatial scene in the drawing. Nancy R. Smith mentions in Experience & Art (1993) that children do not try to create space in the two-dimensional surface; rather they use two-dimensional space to represent their space. Furthermore, Claire Golomb states in the book, The Child's Creation of a Pictorial World (1992), that the balance of spatial arrangement differs in each culture depending on the concept of the aesthetic that each culture has. For Japanese children, the equal distribution of figures in the rectangular space with bird's-eye view might be an expressive method to show the playground and their sensitivity for the aesthetic balance of spatial arrangement, which maybe stronger in

Japanese children than U.S. children. There must be some cultural difference; however, I still do not have a good answer to determine the reason for the different methods of U.S. and Japanese children used to create the space.

Conclusion

From this drawing experiment, "Me and my friends playing in the school yard," some results emerge. One is that an art educational program contributes to children's artistic development. The reason is not only the art education system itself, but also the socialization with peers in the classroom. This means that children can find ways to create a three-dimensional world on the two-dimensional surface through socialization with peers, through such means as imitation and conversation, more easily than working alone.

The tendency of children's drawings in spatial order is not always qualitatively universal and is also not consistent from category to category. Depending on the circumstance that children are in, the pattern is sometimes different, and the children may skip some categories during their development. There are some assumptions related to the cultural and social influences which explain the reasons for the differences in spatial treatment between U.S. and Japanese children. In addition to this result, another interesting finding is that Japanese students use the following advanced techniques in spatial treatment: exaggerated view, bird's eye view, and multiple-perspective view.

Why do Japanese children draw so differently from U.S. children? What causes these characteristics in Japanese children's drawings, when both U.S. and Japanese children are influenced by the same industrial and scientific world, through TV, computer games, and so on? There are several plausible explanations. The most fundamental reason may be the different prevailing aesthetic in each country, due to different social, cultural, and educational influences at work in each culture. Each culture has a different kind of aesthetic. This social and cultural aesthetic feeling is imprinted in children's minds unconsciously and may limit children's works of art in the process of creation. In this discussion, "aesthetic" means an experience of comfort and beauty in viewing specific artworks, an aesthetic which may influence media, ads, and popular culture images to which children are exposed. Remember, this experimentation was implemented in children's classroom when they were given the subject matter "My friends and me playing in the school yard." When children were given the subject matter, they decoded the playing scene from memory and recorded it on the two-dimensional surface with their aesthetic for spatial arrangement. Children did not observe the playing scene directly when they drew, but they used memory with their own aesthetic feeling and then created their preferred space on drawing paper.

As other social and cultural influences appeared in Japanese children's drawings, we should not forget the influence of cartoons (called "Manga") in Japanese society. Manga in Japan is more highly developed than most US cartoons and spread all over Japanese society as visual materials of learning. Through exposure to the cartoon ("Manga") children learn how to draw and create space. Likewise, the visual image from Manga is imprinted in children's memory and decoded in drawings. Originally, Japanese might be visually oriented to learn things and capture their meaning due to the logographic written language of Japanese characters as opposed to the English has phonetic written language.

However, there is no absolute explanation for the kinds of cultural differences that influence children's artistic development, such as tendencies in creation of space. Further experiment, such as collecting drawings of the same subject from children in different regions in Japan, is needed. In addition to Eisner's categories, new spatial categories must be drawn to analyze Japanese children's spatial treatment since Eisner's categories are not sufficient to classify them.