

# AGE AND GENDER DIFFERENCES IN CHILDREN'S DRAWINGS AND CREATIVITY: ABILITIES AND CHARACTERISTICS

Mei-Hue Wei\* and Szu-Chi Lin

National Taichung University of Education, 140 Ming Shin Road, Taichung, Taiwan

Accepted 11 August, 2016

The purpose of this research was to study age and gender effects on young children's drawings and level of creativity. The sample consisted of 280 Taiwanese boys and 316 Taiwanese girls, aged five- and six- years old, with the total of 596 young Taiwanese children. They were given a creativity test, a people-drawing test and a free-drawings test. This study combined both quantitative analyses with the qualitative content analyses. The results showed that six-year-old children scored significantly higher than five-year-old children on people-drawing and free-drawing, but not overall creativity. Also, girls in both age groups, scored significantly higher than boys on people drawings and free drawings, but not overall creativity. The qualitative analyses showed different content characteristics and the gender stereotypes in children's free-drawings and people- drawings between boys and girls.

**Keywords:** Gender, children's free-drawings, Children's people-drawings, creativity

## 1. INTRODUCTION AND BACKGROUND

Children from all over the world like to draw, even before their formal education. We can see a child's world through their drawings. Children's drawings provide a channel for us to understand them better (Eglinton, 2003; Lowenfeld and Brittain, 1987; Wei and Dzung, 2013). The content of a child's drawings may also reflect their life experiences and possible emotional state. The images children have in their mind are shown through their drawings. However, not all children have the ability to transfer their mental images to drawings. These limitations maybe a result of the child's superior domain of intelligence, as well as their mental age (Artut, 2004; Yavuzer, 2007).

We can evaluate children's intellectual development from their drawings (Anning and Ring, 2004; Harris, 1963; Selfe, 1983). Lowenfeld and Brittain (1978) defined children's development of drawing into various stages, including self-expression scribbling stage (2 - 4 years); representational attempts of pre-schematic stage (4 - 7 years); achievement of a form concept of schematic stage (7 - 9 years); dawning realism of gang stage (9 - 11 years); and pseudo-naturalistic stage of reasoning (11 - 13 years). Each stage has its own special characteristics of drawing, and they can reflect children's development of drawing.

### 1.1 Age Effect on Children's Drawings and Creativity

There are many factors which can impact children's drawings. Many studies showed that children's people drawings and free drawings improved with age (Chae, 2003; Kellogg, 1969; Vuslat, 2010; Wei, Huang, and Su, 2015). A study investigated the cultural and age effects on children's drawing and overall creativity. In this study, the researchers asked 1,055 children, aged 6 to 8, from three Taiwanese cultural groups, to complete a people-drawing and a free-drawing as well as a creativity test. The results indicated that the older Taiwanese children scored significantly higher than the younger Taiwanese children on people-drawing and free-drawing but did not score higher on overall creativity (Wei and Dzung, 2013). A Korean study, however, with 1366 preschool children found that the older children performed better than those of the younger children on the test for Creativity Thinking-Drawing Production (Chae, 2003).

### 1.2 Gender Differences of Children's Drawings and Creativity

For the past few decades, the culture, gender differences in children's drawings have been observed and studied (McNiff, 1982). A study investigated gender differences in divergent thinking with a sample of 367 Egyptian boys and

534 Egyptian girls. This study showed that there was no significant difference between genders in terms of the children's divergent thinking (Sayed and Mohamed, 2013). However, the results of another study revealed that girls demonstrated finer motor skills than boys. Girls' drawings had more detailed contents, such as jewelry, fingernails and makeup (Cherney, Seiwert, Dickey and Fitchberg, 2001).

Several studies suggest that boys and girls have different ways of perceiving objects when they draw pictures. As a matter of fact, gender differences were observed in children's drawings, particularly in color choice, figure composition, and indication of motion (Iijima, Arisaka, Minamoto & Arai, 2001; McNiff, 1982). These findings further indicate that when children are younger, their drawings are not strongly impacted by gender, but gradually boys' and girls' drawings begin to differ, not only in the colors they use, but also in the content they draw. Boys tend to draw moving objects and tend to use cold colors, while girls like to draw family members and use warm colors. It was reported that boys prefer drawing active subjects, such as monsters, dinosaurs, vehicles, and spaceships, while girls prefer drawing static subjects, such as kings and queens, landscapes, domestic scenes, people, and animals (Boyatzis and Albertini, 2000; Feinburg, 1979; Reeve and Boyette, 1983).

The previous study indicated that the contents of girls' drawings were more colorful and very often related to their everyday life experiences and events. In contrast, the boys' drawings usually involved cartoons characters or computer games. However, boys with tender personalities who played with girls more often, showed a similarity in drawing content with girls (Wei, Huang, and Su, 2014). A cross-cultural study that involved 700 children, aged six to twelve from 13 countries, showed the gender stereotype in children's drawing contents. Their study indicated that there were gender differences in children's drawings across cultures (Alter-Muri and Vazzano, 2014).

Many studies have been conducted with older children to investigate age and gender effects on creativity and drawings. The main purpose of this study was to investigate the age and gender effects on children's level of creativity and drawings at an early age. The previous studies were either based on quantitative or qualitative. The present study attempted to analyze the effects of age and gender, combining the statistical analyses as well as the content analyses.

## **2. METHOD**

### **2.1. PARTICIPANTS**

Five hundred and ninety-six children (280 boys, 316 girls), aged five- and six- years old, were recruited from either public or private schools and they are all typically developing children. This sample group consisted of 166 boys and 197 girls, six-years-old ( $M=6.3$ ,  $SD = 0.21$  years; range = 6.10–6.90) and 114 boys and 119 girls, five-years-old ( $M=5.32$ ,  $SD = 0.18$  years; range = 5.10–5.90).

### **2.2. MEASURES**

#### **2.2.1. People-Drawing Test Scoring Scale**

Based on Lowenfeld (1987), previous studies of children's drawings, the Goodenough Harris Drawing Test (Harris, 1963), as well as the Chinese People-drawing Test and Scoring Scale (Qiu, 1997), a people-drawing activity was designed to assess children's drawing maturity. In the present study, each child was given a sheet of paper and they were required to draw a man and a woman. The scoring scale consisted of two parts. The first part was the human basic structure which included 13 body parts, such as head, hair, eyes, nose, etc. The second part was the precision degree of the drawing figure which included 27 detailed human accessories and decorations, such as a necklace, ribbon, flower, etc. In the People-drawing Test Scoring Scale, the interrater reliabilities for the scores on these two parts (the human basic structure and the precision of the drawing) were .92 and .89 respectively (Lin and Wei, 2012; Wei and Dzung, 2013). The raters scored one point per item which was shown in children's people drawings either in male or female figure of drawing, with the highest possible score being 40 points.

#### **2.2.2. Free-Drawing Test and Scoring Scale**

A Free-Drawing Test and Scoring Scale was designed by Lin and Wei (2012) to assess children's drawing maturity and richness. This scoring scale was based on Lowenfeld and Brittain's (1987) stages of children's drawing development, and was divided into three subscales, including (1) drawing content: humans, animals, natural scenes, lifeless objects, and fictions; (2) drawing composition and lines used: fullness of the picture, various lines applied, baseline or sky line, and exaggeration between figures; (3) color used. There were 39 items in this free-drawing scoring scale. The raters scored the free drawing which was drawn by each child. In the Free-drawing Test and Scoring Scale, the inter rater reliabilities for the scores on these three subscales were .93, .87, and .95, respectively. The higher the

scores, the greater the drawing maturity and fullness represented in the drawings (Lin and Wei, 2012; Wei and Dzung, 2013).

### 2.2.3. The Williams' Creativity Activity and Scoring Scale

The Chinese version of the Williams' Creativity Assessment Packet of Divergent Thinking Test (Lin and Wang, 1994) was the tool used to measure children's creative performance. There were 12 unfinished drawings on a test sheet that was pre-printed with lines of various shapes. Each child was required to complete the activity within 20 minutes. The creative drawing completed by the child was rated according to the grading system provided by the Williams' Creativity Assessment Packet of Divergent Thinking, to measure the child's creative performance along six dimensions, including fluency, openness, flexibility, originality, elaboration, and naming.

## 2.3 .PROCEDURE

First, the participants were given the children a piece of paper and a pen. The researchers asked them to take 15 minutes to draw a man and a woman from the head to the foot with the pen provide by the researchers. When time was up, the researchers collected each child's people-drawing activity. After the people-drawings were collected, the researchers gave the children another piece of paper and a box of 12 colored crayons. The researchers asked the children to take another 20 minutes, to draw anything they like with any color crayon they choose. When time was up, the researchers collected the finished free-drawing activity of each child. The researchers then gave children the Williams' Creativity Activity which need to be completed within 20 minutes with a pen provided by the researchers. In this activity, the children were asked to write down the name of each finished drawings with the assistance of the researchers. Six raters were recruited and trained to grade these three activities, including Williams' Creativity Activity, people-drawing, and free-drawing activities. Each item counted for one point, and the higher the scores, the greater level of children's creativity and drawing maturity (Wei and Dzung, 2013).

## 3.FINDINGS

### 3.1.THE RESULTS OF QUANTITATIVE ANALYSES

#### 3.1.1.Age difference

The results showed that at age six, children's people-drawings ( $t=7.299$ ,  $p<.000$ ) and free-drawings ( $t=3.037$ ,  $p<.01$ ) were significantly higher than at age five. The results of this study further indicated that children who were six-years-old scored significantly higher than children who were five-years-old, on people drawings, not only on the subscale of human basic structure ( $t=6.327$ ,  $p<.000$ ), but also in the subscale of precision degree of figure drawing ( $t=5.824$ ,  $p<.000$ ) (Table 1). In the scale of free-drawing, children of six-years-old were found significantly higher than children of five-years-old on the total free-drawing scale and the subscale of drawing content, but not on the other two subscales (Table 1&2).

There were no significant differences between these two groups of children for the level of creativity ( $t=.845$ ,  $p=.398$ ) (Table 3). These results were consistent with another study which was done by Wei and Dzung (2013). These results indicated that age has a stronger impact on children's people-drawing and free-drawing than the level of creativity (Table 3).

**Table1:** Means, Standard Deviations, and Comparisons of Age Groups of Children on People Drawing

Scale	Age	<i>N</i>	<i>M</i>	<i>SD</i>	<i>T</i>	<i>p</i>	Cohen's <i>d</i>
The Human Basic Structure	six	363	9.06	1.67	6.327***	.000	0.53
	five	233	8.17	1.68			
The Precision Degree	six	363	2.24	1.94	5.824***	.000	0.49
	five	233	1.39	1.36			
Total Score Of People Drawing	six	363	11.30	2.99	7.299***	.000	0.61
	five	233	9.56	2.58			

**Table2:** Means, Standard Deviations, and Comparisons of Age Groups of Children on Free Drawing

Scale	Age	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	Cohen's <i>d</i>
Drawing Content	six	363	2.16	0.77	4.767***	.000	0.43
	five	233	1.84	0.83			
Drawing Composition And Lines Used	six	363	5.09	1.28	1.854	.064	
	five	233	4.88	1.31			
Color Used	six	363	6.77	2.69	1.808	.071	
	five	233	6.32	3.00			
Total Score Of Free Drawing	six	363	14.01	3.62	3.037**	.002	0.256
	five	233	13.04	3.95			

**Table 3:** Means, Standard Deviations, and Comparisons of Age Groups of Children on Creativity

Scale	Age	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>
Fluency	six	363	11.92	.62	-1.620	.106
	five	233	11.97	.21		
Openness	six	363	14.78	6.37	.902	.368
	five	233	14.28	6.99		
Flexibility	six	363	7.27	1.58	2.210*	.028
	five	233	6.98	1.44		
Originality	six	363	13.41	3.80	-3.138**	.002
	five	233	14.55	4.55		
Elaboration	six	363	7.87	4.94	2.717**	.007
	five	233	6.76	4.64		
Naming	six	363	13.29	2.00	1.233	.218
	five	233	13.07	2.27		
Total score	six	363	68.94	12.29	.845	.398
	five	233	68.00	14.10		

### 3.1.2. Gender difference

The analyses indicated that girls not only scored significantly higher than boys on people-drawings but also scored higher on the scale of free-drawing. The results showed that the six- year-old girls scored significantly higher than boys on the total scale of people-drawing ( $t=4.124$ ,  $p<.000$ ), and the subscale of precision degree of the drawing figures ( $t=5.052$ ,  $p<.000$ ). The group of five-year-old girls scored significantly higher than boys on the total scale of people-drawing ( $t=3.671$ ,  $p<.000$ ), and the subscale of precision degree of the drawing figures ( $t=4.633$ ,  $p<.000$ ). Furthermore, no statistically significant difference was found in the scores on the subscale of human basic structure, between boys and girls in both age groups of children (Table 4).

At the age of six, girls scored significantly higher than boys with the total scale of free-drawing ( $t=3.563$ ,  $p <.000$ ), the subscale of composition and lines-used ( $t=2.464$ ,  $p <.01$ ) and the subscale of color-used ( $t=3.240$ ,  $p <.001$ ). At the age of five, girls scored significantly higher than boys on the total scale of free-drawing ( $t=2.451$ ,  $p <.05$ ), and the subscale of color-used ( $t=2.751$ ,  $p <.01$ ) (Table 5).

**Table4:** Means, Standard Deviations, and Comparisons of Gender Groups of Children on People-Drawing at Age Six and Five

Scale	Age	Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>T</i>	<i>p</i>	Cohen's <i>d</i>
The Human Basic Structure		boy	166	8.90	1.69	1.587	.113	
		girl	197	9.18	1.65			
The Precision Degree	six	boy	166	1.72	1.50	5.052***	.000	-0.52
		girl	197	2.70	2.15			
Total Score Of People Drawing		Boy	166	10.63	2.57	4.124***	.000	-0.43
		girl	197	11.88	3.21			

## Continuation of Table 4

Scale	Age	Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>T</i>	<i>p</i>	Cohen's <i>d</i>
The Human Basic Structure		Boy	114	7.96	1.85	1.927	.055	
		girl	119	8.38	1.48			
The Precision Degree	five	Boy	114	.98	1.15	4.633***	.000	-0.60
		Girl	119	1.77	1.44			
Total Score Of People Drawing		Boy	114	8.94	2.59	3.671***	.000	-0.48
		girl	119	10.15	2.49			

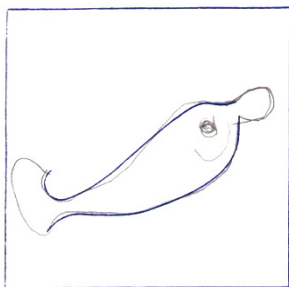
Table5: Means, Standard Deviations, and Comparisons of Gender Groups of Children on Free-Drawing at Age Six and Five

Scale	Age	Gender	<i>n</i>	<i>M</i>	<i>SD</i>	<i>T</i>	<i>p</i>	Cohen's <i>d</i>
Drawing Content		Boy	166	2.09	.73	1.267	.206	
		girl	197	2.20	.78			
Composition And Lines Used	six	Boy	166	4.89	1.26	2.464*	.014	-0.27
		girl	197	5.23	1.27			
Color Used		Boy	166	6.26	2.65	3.240**	.001	-0.35
		girl	197	7.18	2.68			
Total Score Of Free Drawing		Boy	166	13.25	3.54	3.563***	.000	-0.38
		girl	197	14.60	3.58			
Drawing Content		boy	114	1.78	.86	1.031	.304	
		girl	119	1.89	.80			
Composition And Lines Used	five	boy	114	4.84	1.33	.435	.664	
		girl	119	4.92	1.30			
Color Used		boy	114	5.76	2.78	2.751**	.006	-0.37
		girl	119	6.86	3.13			
Total Score Of Free Drawing		boy	114	12.38	3.82	2.451*	.015	-0.33
		girl	119	13.67	3.98			

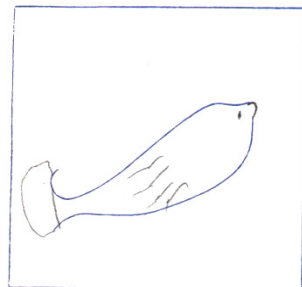
The results revealed that there were no statistically significant differences in the level of creativity between boys and girls in the five-year-old ( $t=.492$   $p=.623$ ) and six-year-old age groups ( $t=1.235$   $p=.218$ ). It is worth noting that, although the boys' overall creativity scores ( $M = 68.47$ ,  $SD = 14.22$ ) were higher than girls ( $M = 67.54$ ,  $SD = 14.02$ ), no significant differences were found between them at this early age.

### 3.2.THE QUALITATIVE ANALYSES OF CHILDREN'S CREATIVITY

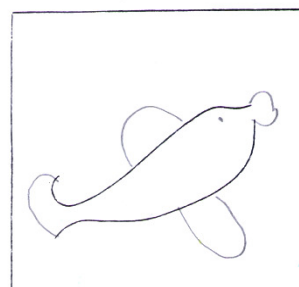
The findings revealed that children in the same age group completed the creative activities with similar results. There was a great deal of similarity in the work of the five- and six-year-old children, with a high percentage of 34.7%, 22.4% and 36.5% respectively for the creative drawing stimulator which was provided. One of the possible reasons was that the children imitated each other (Figure1-1, 1-2,1-3). Another reason may have been that these children have had the same life experiences since they are from the same culture and social groups. It is possible that at this early stage in life, their experiences are limited, thus creativity is also limited. The main reason is that children's life experiences are the source of creativity. The researcher found that children who have more confidence usually express themselves with less reluctance either verbally or emotionally. Usually, this confidence leads them to a higher level of creativity.



1 海豚



1 海豚



1 海豚

Fig. 1-1

Fig.1-2

Fig.1-3

### 3.3.THE QUALITATIVE ANALYSIS OF CHILDREN’S DRAWINGS OF PEOPLE

#### 3.3.1.Age difference

Lowenfeld and Brittain (1987) divided children’s development of drawing into various stages. All children go through these stages of drawing. The findings showed that children in the same age group draw in a similar way. For instance, five-year-old children drew more stick figures with very little details. They focused more on the face, usually with a happy smile, and they did not draw details, but used simple lines to draw hands and feet (Figure2-1, 2-2, 2-3).

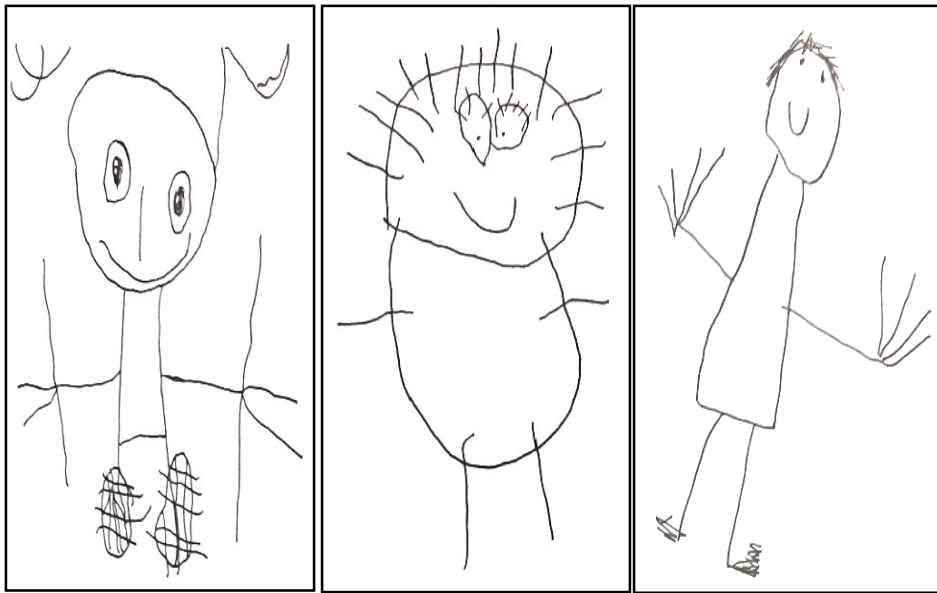


Fig.2-1

Fig.2-2

Fig.2-3

Six-year-olds drew with more detail. For example, they had two dimensional fingers, sox, buttons, necklaces, hair and eyeballs. When they drew people, they focused on interests of the person being drawn and they neglected proper proportion and logic. See the example Figure 2-7 of the girl with hair that touches the floor, Figure 2-8 that showed a baby’s leg coming off the picture of the mother and Figure 2-9 of the boy with an extremely long body.



Fig.2-7

Fig.2-8

Fig.2-9

This characteristic of young children showed up in children's drawings in this study. When children draw, they seem to focus on what they are interested in but neglect other parts. For example, in Figure 2-10 of a girl wearing shiny shoes,

this child focused on the decorations on the shoes, but neglected the details on the clothes. The examples shown in Figure 2-11 and Figure 2-12, illustrate that the details in these drawings appear in the clothes, but they are neglected in facial parts, such as ears, nose or eye brows.

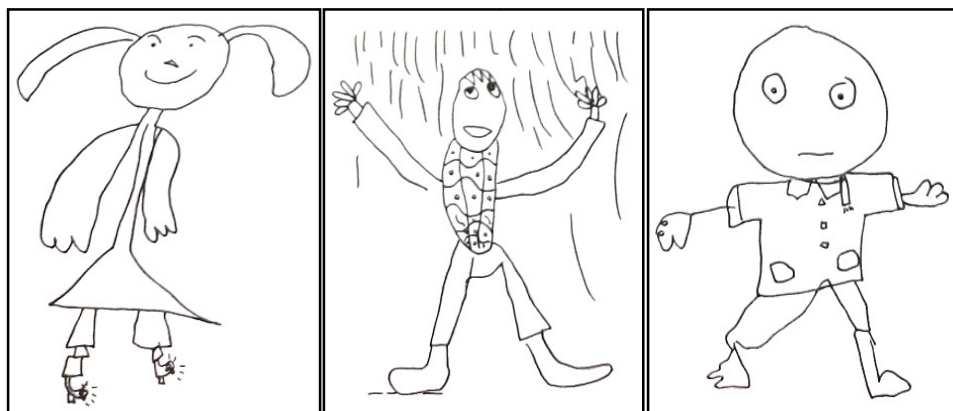


Fig.2-10

Fig.2-11

Fig.2-12

### 3.3.2. Gender difference

The findings revealed that girls' drawings of people were more detailed. For example in this study, girls preferred to draw designs on the clothing and add ribbons, earrings and necklaces to the people they draw. The analysis showed that there were 11 boys who put ribbons on their drawings while there were 43 girls who drew ribbons. There were 104 girls who put decorations such as flowers, buttons or other designs on the clothes while there were only 49 boys who did so.

In this study, the participants were asked to draw a male and a female figure. Most of the children drew females with skirts and long hair, while drawing male figures with short hair and pants. The results of this study indicated that the gender stereotypes of drawings were found in their drawings of people.

## 3.4. THE QUALITATIVE ANALYSIS OF CHILDREN'S FREE DRAWINGS

### 3.4.1. Age Difference

As children grow, they become more detailed in their drawings. The content of their drawings can reflect their life as well as things with which they come in contact or events that happen around them. For example, in Figure 3-1, a six year old child drew himself and added a house and a tree. In Figures 3-2 and 3-3, the children drew cartoon figures of a little mermaid and superman to reflect their favorite cartoon figures. They also added clouds, houses, flowers and friends in their drawings.



Fig.3-1

Fig.3-2

Fig.3-3

Research states that children drew subjects that are based on their pre-learned knowledge. This includes legends, stories and tales told to them (Güvenç, 2005; Vuslat ,2010). Formal education also makes a difference. In the present study, three six year old children from the same classroom were exposed to lessons about gardening. These learning experiences were evident in their free-drawings (Figures 3-4,3-5&3-6) with the children depicting gardens, picking fruit with a ladder, and a child watering the flowers. The findings of this study were consistent with the other studies (Wei, Hung and Su, 2015). A rich learning environment led these three six-year- old children to have more detailed drawing content. These characteristics of drawing are usually more evident in older children.



Fig.3-4



Fig.3-5



Fig.3-6

Children from different cultures often have unique ways of expressing their ideas through drawing. In the six-year age group, children's free-drawings were more mature than five-year- old children, not only the variant lines they used, but also the colors they put on the drawings. At age five, children's drawings were often lacking details(Figures 3-7, 3-8 &3-9 of six-years-old children and Figures 3-10,3-11 &3-12 of five-year-old children).



Fig.3-7



Fig.3-8



Fig.3-9



Fig.3-10



Fig.3-11

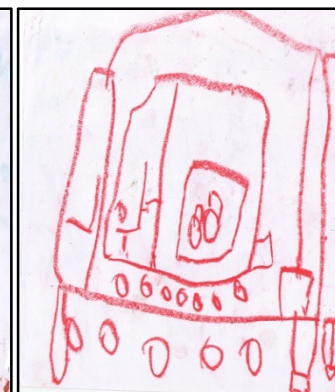


Fig.3-12



### 3.4.2. Gender difference

The results revealed that most five- and six-year-old children, like to draw human figures. In children's free-drawings, there were 231 people in girls' drawings and 189 people in boy's drawings. Most of the children either drew themselves, families, or friends. A lot of natural scenes, such as sun, clouds, trees, and flowers appeared in 195 boys' free-drawings and 239 girls' free drawings. In addition, 87 of the girls drew animals in their free-drawings, compared to 60 boys who did so.

Different content characteristics were also observed in these free-drawings between girls and boys. Boys tended to draw more lifeless subjects, such as robots and cars. When the children drew fiction and cartoon figures, girls tended to draw princesses or queens while boys preferred to draw hero figures.

## 4.DISCUSSION

Children's drawing skill development can be divided into several stages according to their maturity and age (Kellogg,1969).The purpose of this research was to study age and gender effects on young children's drawings and creativity. In general, the findings of this study showed that young children had certain aspects in common in their creativity drawings. The findings of this study were consistent with other studies which show that age and gender impact children's drawing capabilities as well as the contents of the drawings. The results of this study indicated that children, at ages five and six, do not have significant differences in the level of creativity, but six-year-old children scored significantly higher than five-year-old children on their people-drawings and free-drawings.

One interesting finding was that girls scored significantly higher than boys on the total scale of people-drawing, and the subscale of the precision degree of drawing a figure, but not the subscale of the human basic structure. Also, in the free-drawing the researchers found that girls in both age groups, scored significantly higher than boys in the total scale and the scale of color-used in their drawings, but no significant difference was found in the subscale of drawing content. The results indicated that girls scored higher in their drawing than boys at these young ages. It is also possible, however, that the attitudes between girls and boys when they draw are quite different. In the Asian countries, girls are usually more obedient to parents and teachers. Girls have a tendency to follow rules and take things more seriously even when they draw, and very often that is not the case for boys.

One characteristic of the drawings is that we see a lot of gender stereotypes between boys and girls, not only in the colors they choose, but also the clothes they drew, the decorations they used, and the cartoon figures depicted in their pictures. This phenomenon can be explained in the way we raise our children and the environment we provide for them which are actually based on certain social expectations and often plant the seeds for gender stereotypes.

This study combined both quantitative analyses with the qualitative content analyses, we actually can see that age and gender do make a difference in young children's drawings. The findings of both analyses were consistent with each other, girl's people drawings and free drawings were found more detailed and delicate than those of boy's. The children in this study, however, were quite young; thus they were easily distracted by their surroundings. One limitation of this study is that the researchers did not test the children individually. The 596 children in this study were presented the three testing activities in small groups. Although the children were informed to do their own work, they may have imitated each other, thus this circumstance needs to be taken into account.

## ACKNOWLEDGMENTS

This research was supported by grants from the National Science Council of Taiwan, The Republic of China (NSC 103-2410-H-142 -008), and National Taichung University of Education.

## REFERENCES

- Anning, A. and Ring, K. (2004). *Making Sense of Children's Drawings*. Maiden head: Open University Press
- Alter-Muri, S. B. and Vazzano, S. (2014). Gender typicality in children's art development: a cross-cultural study. *The Arts in Psychotherapy*, 41(2), 155-162.
- Artut, K. (2004a). *Art education in early childhood education*. Ankara: AnÖ Publishing.
- Boyatzis, C., and Albertini, G. (2000). A naturalistic observation of children drawing: peer Collaboration processes and influences in children's art. *New Dir Child Adolesc Dev.*(90), 31-38.
- Chae, S. (2003) Adaptation of a picture-type creativity test for pre-school children. *Language Testing*, 20, 178-189.
- Cherney, I., Seiwert, C., Dickey, T., and Fitchberg, J. (2001). Children's drawings: a mirror to their minds. *Educational Psychology*, 26(1), 127-142.

- Eglinton, K. A. (2003) *Art in the early years*. New York, NY: Routledge.
- Feinburg, S. G. (1979). Conceptual content and spatial characteristics in boys' and girls' drawings of fighting and helping. *Studies in Art Education, 18*, 63-72.
- Harris, D. B. (1963). *Children's drawings as a measure of intellectual maturity*. New York, NY: Harcourt, Brace, & World.
- Iijima, M., Arisaka, O., Minamoto, F., and Arai, Y. (2001). Sex differences in children's free drawings: a study on girls with congenital adrenal hyperplasia. *Hormones and Behavior, 40*, 99–104.
- Kellogg, R. (1969). *Analyzing children's art*. Palo Alto, CA: Mayfield.
- Lin, S. Q., & Wei, M. H. (2012) Analysis and study of children's creativity and abilities of people-and free-drawings in different culture. *Journal of National Pingtung University of Education Liberal Arts & Social Sciences, 39*, 35-74.
- Lin, C., and Wang, M. (1994). *The creativity assessment packet*. Taipei, Taiwan: Psychological Publishing Co.
- Lowenfeld, V. and Brittain, L. (1987) *Creative and mental growth*. (8th ed.) New York, NY: Macmillan.
- McNiff, K. (1982). Sex differences in children's art. *Journal of Education, 164*, 271-289.
- Qiu, S. C. (1997) *Chinese people-drawing test and scoring scale*. Taipei, Taiwan: Psychological Publishing Co.
- Reeve, J., and Boyette, N. (1983). What does children's art work tell us about gender? *Qualitative Sociology, 84(6)*, 322-333.
- Sayed E. M. and Mohamed, A.H.H. (2013). Gender differences in divergent thinking: use of the Test of Creative Thinking-Drawing Production on an Egyptian sample. *Creativity Research Journal, 25 (2)*, 222-227.
- Vuslat, O. (2010). The factors influencing children's drawings. *Procedia Social and Behavioral Sciences, 2*, 3003–3007
- Wei, M.H. and Dzung, A. (2013). Cultural and age differences of three groups of Taiwanese young children's creativity and drawing. *Psychological Reports, 112, 3*, 900-912.
- Wei, M.H., Huang, S.H., and Su, Y. F. (2015). Studies of the Factors and How Different Inspirational Teaching Methods can Affect Taiwanese Young Children's Drawing Content. *Journal of Socialomics, 4(1)*, 1-3.
- Yavuzer, H. (2007). *Images of children* (12th Printing). Istanbul: Remzi Kitabevi.