Creativity and Drawing Abilities of Chinese Students in Hong Kong: Is There a Connection?

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Abstract

Background: Recognizing that arts education is important in facilitating learning and in enhancing creativity in students, recent education reform in Hong Kong has sought to promote arts education and efforts to encourage creative expression through different art forms. Among different modes of creative arts expression, drawing has been suggested as the best choice for allowing creative expression by students with high ability in visual arts. Therefore, the connection between students' drawing and creativity warranted investigation.

Aims: This study explored the drawing abilities and creativity of Chinese students in Hong Kong based on their drawing performance, and examined their connection in relation to students' self-perceived artistic characteristics and involvement in drawing activities.

Sample: 105 Hong Kong Chinese primary and secondary school students, nominated by their schools to participate in the gifted programs of the Chinese University of Hong Kong, participated voluntarily in this study.

Method: Students completed two drawing tasks adapted from Clark's Drawing Abilities Test and a self-report questionnaire that included the Artistic Characteristics Scale of the Scales for Rating the Behavioral Characteristics of Superior Students and the Drawing Activity Checklist. The drawings were rated on students' drawing abilities and creativity by three Chinese visual artists as expert judges.

Results: Judges agreed more on their ratings on students' drawing abilities than on students' creativity. Judged drawing abilities and creativity were found to be moderately but significantly correlated. While judged drawing abilities were found to correlate significantly with students' self-reported artistic characteristics and drawing activities, judged creativity was found to correlate minimally with these variables.

Conclusion: This study provided supportive evidence on the connection between drawing abilities and creativity. The findings also suggested that creativity enhancement via increasing participation in drawing activities and heightening awareness of artistic characteristics could be mediated by increased drawing abilities.

Keywords: Creativity; drawing abilities; Chinese; Hong Kong

香港華人學生的創造力和繪畫能力：兩者有否關連？

摘要

背景：近年香港認識到藝術教育對促進學生學習和提升創造力的重要性，故教育改革提出應重視藝術教育和鼓勵以各種藝術方式表達創意。繪畫被認爲最適合具視覺藝術才能學生表達創意的方法；因此，學生繪畫能力與創造力的關係值得探討。

目的：根據香港華人學生所畫的圖畫，評定其繪畫能力和創造力，並檢視兩者與學生的藝術特質及參與繪畫活動的關係。

研究對象： 105 名由學校推薦參加香港中文大學資優課程的中小學生。

研究方法： 學生繪畫兩幅採自 Clark's Drawing Abilities Test 的項目和填答一份問卷。問卷包括評定高能力學生行爲特質的藝術特質量表和學生參與繪畫活動量表。學生繪畫的圖畫由三位華人視覺藝術家作評分。

研究結果：專家們對學生畫畫能力的評分比給學生創造力的評分較一致。學生繪畫能力得分和創造力得分有顯著性中等相關。繪畫能力得分也與自我評定藝術特質和參與繪畫活動有顯著性相關，但創造力得分即與上述兩個變項只有極微的相關性。

總結：本研究爲繪畫能力和創造力的相關性提供具支持性的數據，提出多參與繪畫活動和提高藝術特質意識，將有助提高繪畫能力，從而有助提升創造力。

關鍵詞： 創造力、繪畫能力、華人、香港

Education in Hong Kong has often been criticized as biased in favoring academic achievement, where students' scholastic performance on academic subjects is prized over their performance on music and visual arts (Wong & Cheung, 2002). Arts education, including visual arts activities such as drawing, painting, sculpting, designing, and collage, is at best peripheral, and requires defense within the regular school curriculum. Thus, critics have lamented that the resulting limited exposure to the arts might have inadvertently led to fewer opportunities for Hong Kong Chinese students to express their abilities in expressive areas (e.g., Yu, 2001).

In recent years, it is increasingly recognized that the arts offer much to support the academic achievement of students (see Murfee, 1995; Ruppert, 2006), and arts education contributes to students' aesthetic development, and the development of thinking and creativity (see Clement, 1992; Schirrmacher, 1993). Thus, recent education reform has initiated efforts to promote arts education as part of a balanced education aimed at students' whole-person development fundamental to the intellectual, emotional, and creative growth of children and youths (see Education Commission, 2000). Specifically, arts education is defined as one of eight key learning areas, among Chinese-language, English-language, mathematics, personal-social-and-humanities, science, technology, and physical education (Curriculum Development Council, 2002).

The new Arts Education Key Learning Area Curriculum Guide, in parallel to all key learning areas, articulates four learning targets aimed to develop creativity and imagination, to develop skills and processes, to cultivate critical responses, and to understand arts in context. To achieve these targets, integrated learning activities across different art forms (visual arts, music, drama, dance, media arts) are suggested. The emphasis is on allowing students to experience arts by active student participation that involves learning to think through discovery and inquiry, learning to perform and create, and learning to appreciate and appraise their own and others' artworks. In summary, contrary to traditional practice, arts

education is now considered nontrivial and even important in facilitating valued learning and in enhancing creativity in students.

Of particular interest in arts education is its important role in promoting creative expression and in enhancing creativity. While this role has often been assumed, the connection between arts education and creativity has rarely been demonstrated. Focusing on visual arts, it would be difficult to demonstrate a connection between visual arts talents and creativity, as visual arts talents could be manifested in multiple ways and in diverse visual arts media. Among the different modes of creative arts expression, drawing has been suggested as the best choice, and a drawing task provides an appropriate way for allowing creative expressions by students with high ability in visual arts (see Clark & Zimmerman, 2004). It is also said that drawing abilities are evidence of skills and knowledge in the arts and the art domains (DiLeo, 1977), and drawing taps into right-brain functioning that might enhance creativity (see Edwards, 1999).

Approaching the studies of drawing as indicative of visual arts talents in students, Clark (1989) developed Clark's Drawing Abilities Test (CDAT) for screening and identifying students talented in visual arts for admission to the Indiana University Summer Art Institute. The test consists of four drawing tasks: Draw an interesting house as if you were looking at it from across the street; draw a person who is running very fast; make a drawing of you and your friends playing in a playground; and make a fantasy drawing from your imagination. Based on past research studies, these four drawing tasks are considered fundamental to drawing abilities by visual arts teachers (Clark & Wilson, 1991). Specifically, these tasks call for the demonstration of very different yet basic drawing abilities, skills, and creative expressions (Clark & Zimmerman, 2004). The house drawing task requires depicting perspective, textures, meaningful shapes and sizes, and recognizable details. The running-person drawing task requires the portrayal of motion or movements, as well as body proportions and recognizable details. The persons-in-playground drawing task requires portraying figures accurately, composing in receding space, and grouping figures in that space. The fantasy drawing task provides opportunities for participants to use their

imaginations to portray what they wish, the things they know and can draw well. A set of criteria have been formulated for scoring these tasks in terms of originality, expressiveness, and creative solutions as well as drawing skills.

In Hong Kong, CDAT has been adapted for use in projects and research (e.g., Ka, 1999), and students' performance on the drawing tasks has been compared to corresponding sample drawings rated below average, average, and above average (see Clark & Zimmerman, 2004) by teachers to screen students for admission to programs for artistically talented students. In this regard, it is of great interest to explore whether students' performance on the CDAT drawing tasks could reflect students' drawing abilities as well as their creativity, and examine the connection between drawing abilities and creativity. With this view, this study aimed to collect drawings on two CDAT drawing tasks from a sample of Chinese gifted students, and three Chinese visual artists enlisted as expert judges in this study rated students' drawing abilities as well as creativity based on their performance on the two CDAT drawing tasks. In addition, the connection between judges' ratings on students' drawing abilities and their ratings on students' creativity in relation to gender, age, perceived artistic characteristics, and involvement in drawing activities were explored.

Method

Participants

A total of 105 Chinese students, 57 primary (grades 3 to 6) and 48 secondary (grades 7 to 12) students, participated voluntarily in this study. These students (45 boys and 60 girls), aged 7 to 18 (M = 11.35, SD = 2.31), were nominated by their schools to participate in a variety of gifted programs provided at different times at the Chinese University of Hong Kong over a period of three months. In nominating students, schools were requested to recommend students who were judged to be either gifted intellectually (e.g., with a high IQ score), or academically (e.g., with outstanding performances in school subjects), or had demonstrated talents in other specific nonacademic areas such as music, art, and leadership. In addition, teachers were reminded to make their own judgment based on their knowledge of their students, bearing in mind that students could be regarded as gifted in different domains (Education Commission, 1990). Thus, this sample of participants could be

regarded as relatively heterogeneous in terms of their giftedness or talents, and represented students from a broad age range.

Measures or Tasks

The Drawing Tasks. The house and the running-person drawing tasks adapted from CDAT were used in this study. The CDAT has been used and tested with over 5,000 upper elementary, middle school, and high school students in the United States and other countries, and has been shown to be valid, reliable, and highly effective as a standardized screening and identification measure for artistically talented students (Clark & Zimmerman, 2004). Clark and Zimmerman (2004) also reported that scores on the CDAT drawings correlated significantly with teachers' ranking of student success in classes for artistically talented students in summer arts institutes. In this study, three Chinese visual artists (two men and one woman) were enlisted to serve as expert judges to rate students' drawings. Judge 1 only made ratings on drawing abilities, Judge 3 only made ratings on creativity, and Judge 2 made ratings on both drawing abilities and creativity. Specifically, based on students' two drawings, Judge 1 and Judge 2 rated the students' drawing skills using a three-point scale, 1 (*below average*), 2 (*average*), and 3 (*above average*), and Judge 2 and Judge 3 rated the students' creativity using a three-point scale, 1 (*low*), 2 (*medium*), and 3 (*high*).

The Artistic Characteristics Scale. The Chinese version of the Artistic Characteristics Scale of the Scales for Rating the Behavioral Characteristics of Superior Students (SRBCSS; Renzulli, Smith, White, Callahan, & Hartman, 1976) was used in this study. The scale includes eleven items assessing students' interest and commitment in visual arts activities, creative artworks, and their keen observation and sensitivity to environment. In this study, the scale was used in a self-report form for students to rate themselves on their artistic characteristics using a six-point scale, 1 (*never*), 2 (*very rarely*), 3 (*rarely*), 4 (*occasionally*), 5 (*frequently*), and 6 (*always*). A global score can be obtained by summing the item responses.

Drawing Activity Checklist. The 5-item checklist of drawing or drawing-related activities was developed for this study. Students were asked to answer yes or no to whether they liked to draw in spare time, enjoyed drawing lessons in school, took extra drawing

lessons outside school, took part in drawing competitions, and won awards in drawing competitions.

Procedure

All 105 nominated students were requested to participate voluntarily with the consent of their parents in a larger research project of which this study was a part. These students were tested in groups of 30-50. They were asked to complete two drawing tasks, each of 12 minutes, based on the CDAT tasks of drawing a house and a running person. These drawings provided the data for three Chinese visual artists in this study to make expert judgments on the students' drawing abilities and their creativity. Specifically, both students' drawing abilities and creativity were rated in three categories interpretable as low, medium, or high. Students also completed a self-report questionnaire that included the Artistic Characteristics Scale of SRBCSS and the Drawing Activity Checklist.

Results

Expert Judgments on Students' Abilities and Creativity

Each student's two drawings (the running person and the house) were first rated independently by Judge 1 and Judge 2 on the student's drawing abilities as reflected by the student's performance on a three-point scale. One judge (Judge 2) also gave half points (1.5 and 2.5). However, the number of drawings with half-point scores was very small, and it was deemed appropriate to maintain scoring the drawings into three categories of low (1), medium (1.5 or 2), and high (2.5 to 3) for analyses related to this classification. Table 1 shows the distribution of drawings in the three categories by the two expert judges, indicating that the majority of the drawings were rated below average or reflecting low drawing abilities (54% to 79%), a smaller number were rated average or reflecting medium drawing abilities (16% to 39%), and very few drawings were rated above average or reflecting high drawing abilities (4% to 7%).

The two drawings by students were again judged by two expert judges, Judge 2 and Judge 3, on a three-point scale, reflecting low, medium, and high creativity. Table 1 also shows the distribution of drawings in low, medium, and high creativity (which could be interpreted to mean, not creative, somewhat creative, and more creative). It

can be seen that 16% to 35% of the drawings were rated as relatively creative (high creativity).

Intra- and Inter-Judge Agreement on Ratings of Drawing Abilities and Creativity

Since expert judges did not always agree on their ratings of the same drawing, and each judge might not give similar ratings on the two drawings by a student, three measures of agreement (the chi-square, Cramer's *V*, and kappa) were computed to reflect these inter-judge and intra-judge agreement. Table 2 summarizes these agreement indices as well as the concordance rates. It can be seen from Table 2 that there was substantial and significant inter-judge and intra-judge agreement on the ratings of drawing abilities, with a concordance rate above 65%. In contrast, the agreement indices on the ratings on creativity were less substantial and even nonsignificant, especially for inter-judge agreement on the running-person drawing and for Judge 2's intra-judge agreement on rating the two drawings, with concordance rates falling below 50%.

From a slightly different perspective, Table 3 presents the cross-tabulation of drawings based on judges' ratings on drawing abilities and creativity. It can be seen that 3 house drawings and 5 running-person drawings were judged as high on drawing abilities by two judges, whereas 18 house drawings and 7 running-person drawings were judged as creative by two judges.

Illustrative Drawings from Students

Figure 1 shows the student drawings that were rated by both Judges 1 and 2 as high in drawing abilities (Figures 1a and 1b), and Figure 2 shows the drawing that were rated by Judges 2 and 3 as high in creativity (Figures 2a and 2b). Judges were presented with the drawings and were asked to explain why the drawings were rated as high in drawing abilities or creativity. The following descriptions are summarized from comments made by the judges.

Figure 1a was the drawing of a 15-year-old boy in Secondary Four. His drawing ability was rated above average because he was able to show dramatic lighting with a free-style crosshatching and shading. He was expressive with lines drawn with variety and confidence. The overall composition suggested a well-balanced subject with the dark corner of the picture counter-balanced by the car in the middle-ground lying on the diagonal.

Figure 1b shows a running person drawn by a 10-year-old girl in Primary Five. The main character was shown running in a relay track event, depicting the moment she was about to pass the relay stick to the next runner. Both judges commented that the body proportions and the posture of the main character were drawn realistically, and the lines drawn with different weights showed different textures and the flowing of drapery.

Figure 2a was drawn by a 14-year-old girl in Secondary Two. She showed her many ideas in drawing the house with a distinctive spiral shape. The picture was filled with details, including solar energy panels, a swing, glass slides, and electronic receptors. There were some visual elements (clouds and fireworks) that were creatively placed outside the picture frame.

Figure 2b was drawn by a 14-year-old girl in Secondary Three. The layout of the picture was simple, but it encouraged the viewers to focus on the main character. The unrealistic running posture and the pulling of her arms together to the back created a kind of tension that exaggerated the dramatic effects. The fierce teeth, the curly hair, and most importantly, the long, widely spread legs were highly valued by judges as creative touches.

It was of interest that in the judgment of creativity, some drawings were judged to be creative by one judge and not creative by another judge. Examples of these drawings with discrepant ratings by the two judges are shown in Figure 3. The following is the summarization of judges' comments when the judges were presented with the drawings in the interviews after the ratings. The different focus and emphasis of two judges explained their discrepant ratings.

Figure 3b was rated as creative by one judge (Judge 3) who recognized the connection of the two pictures (Figures 3a and 3b) drawn by the same student (a nine-year-old boy in Primary Four) who creatively made use of the two separate drawing tasks (the house and the running person) to develop a story connecting the two drawings. The other judge (Judge 2) rated the two drawings separately as separate drawing tasks, and therefore did not rate them as creative.

The drawing in Figure 3c drawn by a 13-year-old boy in Secondary One was rated as creative by one judge (Judge 3) because of the interesting interaction between the environment and the house.

The other judge (Judge 2) just considered the interaction as a nice idea but not creative. But only this judge (Judge 2) rated Figure 3d drawn by a 12-year-old girl in Secondary One as a creative picture as household items were used to show an interesting house with a human faces.

Drawing Abilities, Creativity, and Their Correlates

To explore the relationships between students' drawing abilities and their creativity, global scores of drawing abilities and creativity were computed by aggregating ratings on the two drawings by two judges. The two global scores on drawing abilities and creativity were moderately but significantly correlated ($r = .21$, $p < .05$). To further explore the correlates of drawing abilities and creativity, correlations of the two global scores with gender and age, and students' self-report responses on artistic characteristics and drawing activities were computed. The results of the analysis based on 102 students who had complete data are summarized in Table 4. It can be seen that students' age, self-report artistic characteristics and drawing activities, especially participation in competition and winning awards, did correlate significantly with judged drawing abilities, but not with judged creativity. These results suggested that students high in drawing abilities might involve more in drawing activities and perceive themselves as more artistic, or conversely their self-perception and the involvement in these activities might serve to motivate them to acquire higher levels of drawing skills. In contrast, creativity did not seem to have a strong association with involvement in drawing activities and artistic self-perception. Since age was found to correlate substantially with judged drawing abilities, indicating that older students were more likely to be judged as having higher drawing abilities than were younger students, the correlation analysis was repeated using partial correlation. It was observed as shown in Table 4 that a similar pattern of results emerged when the effect of age was controlled.

Discussion

The connection between creativity and arts education in general and drawing in particular implies that the arts curriculum, including drawing, is important in the development and enhancement of creativity or creative thinking in children. However, this connection has often been assumed but

remained unexamined. This study provided an opportunity to invalidate the connection between drawing abilities and creativity, and the connection, though somewhat weak but significant, survived the test. On that basis, perhaps one could speculate that the findings implied that a drawing curriculum did impact the development or enhancement of creativity. However, it was not known whether students with higher drawing abilities would engage more in creative expressions, or conversely, more creative students tended to acquire greater skills and expertise in drawing. While a case of bidirectional influence and feedback was likely, the cross-sectional nature of the data did not allow the determination of the dominant directionality of the causal influence. Thus, future investigations should consider multiple-point assessments of drawing abilities and creativity in longitudinal studies.

This study also examined the correlates of drawing abilities and of creativity. While drawing abilities were associated substantially and significantly with self-perceived artistic characteristics as well as self-reported drawing or drawing-related activities, creativity had minimal connections with these variables. It was plausible that the self perception of artistic characteristics and participation in drawing activities could impact drawing abilities, although one could not rule out that students with high drawing abilities might tend to perceive themselves more favorably as artistic and engage in more drawing activities. The somewhat puzzling findings that creativity had minimal associations with artistic self-perceptions and drawing activities suggested that drawing abilities could play a mediating role in enhancing creativity through increasing participation in drawing activities and heightening awareness of artistic characteristics. Nonetheless, the complex relationships among these variables warrant further investigations in future longitudinal studies.

Evidently, there are many limitations in the present study, including the cross-sectional design, which precluded the determination of the directionality of causal influence mentioned earlier. Perhaps, another obvious limitation was the selection of the present sample of gifted students for this study, as all students in this sample were nominated by teachers who could be biased in nominating only high academic achievers, even though teachers were urged to nominate students with talents

in academic as well as nonacademic domains, including visual arts. While it was hoped initially that enlisting gifted students with diverse talents that included visual arts talents might place fewer restrictions on the upper range of artistic abilities to be assessed, it was not known whether one could miss out on the lower end of the artistic abilities spectrum. Thus, cross-replications with samples drawn from the general population of students might increase the generalizability of the present findings and provide greater insight into the connection between drawing abilities and creativity.

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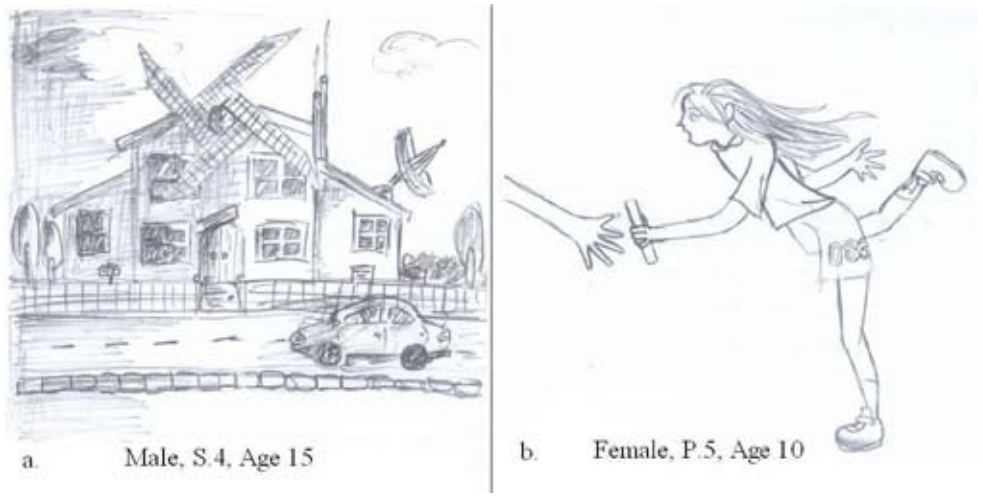

Figure 1. House and running-person drawings judged by both judges to be high in drawing abilities.

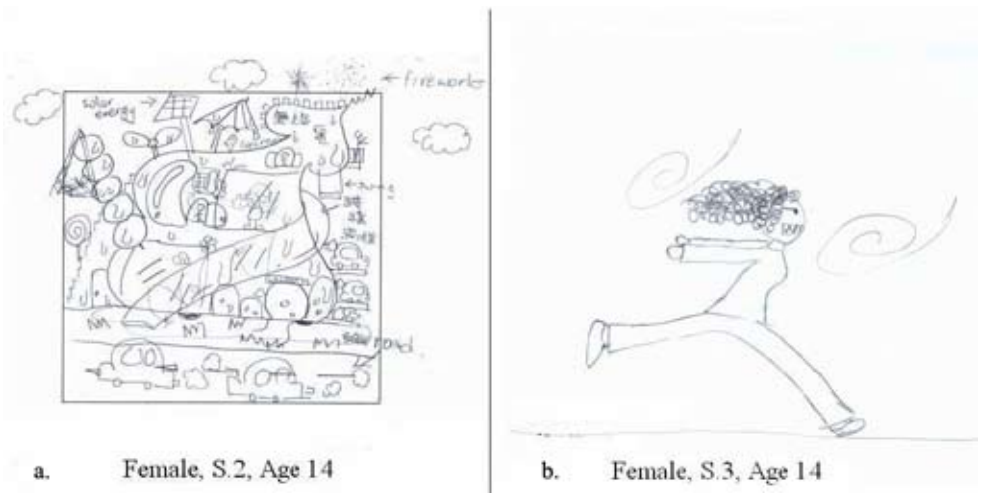

Figure 2. House and running-person drawings judged by both judges to be high in creativity.

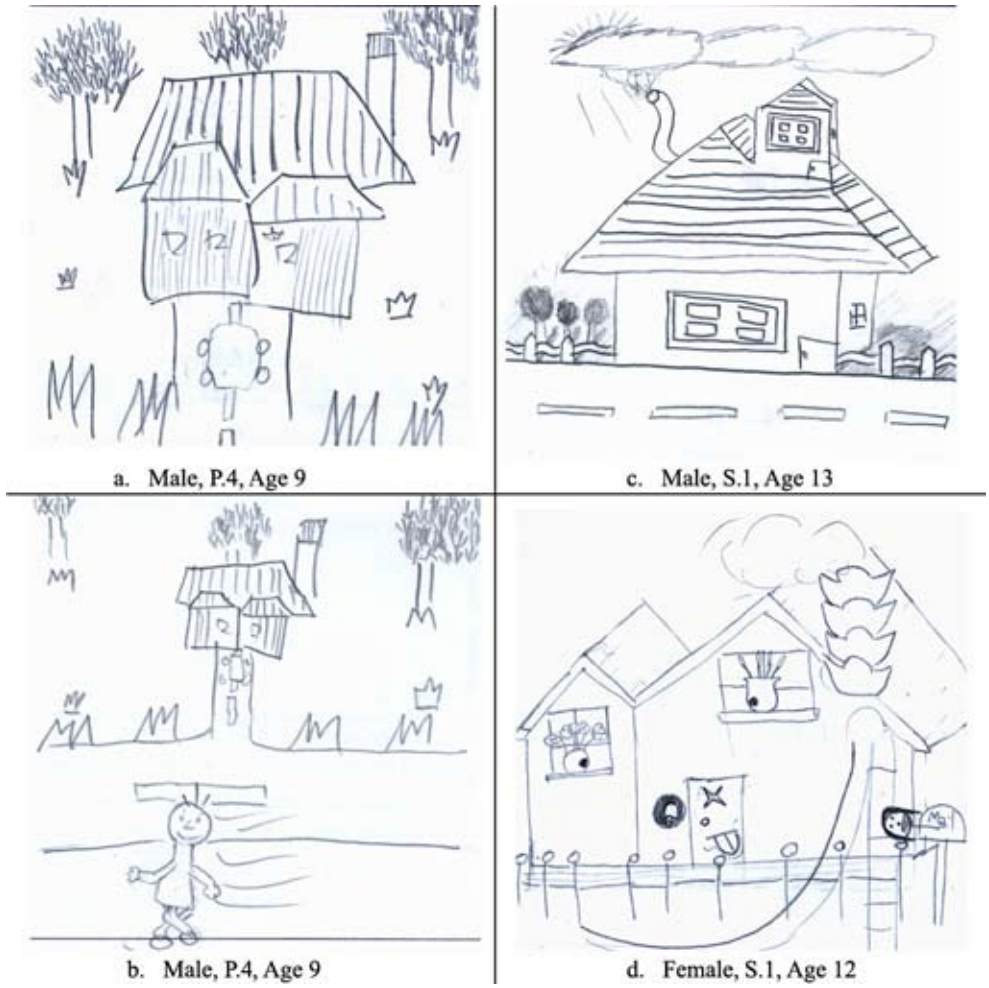

Figure 3. House and running-person drawings judged to be creative by one judge and noncreative by the other judge.

Table 1

The Distribution of Drawings by Expert Judgments on Students' Drawing Abilities and Creativity (N=105)

	Expert Judgment		
	Low %	Medium %	High %
Judgment on drawing abilities			
Drawing task: Running Person			
Judge 1	79.0	16.2	4.8
Judge 2	54.3	39.0	6.7
Drawing task: House			
Judge 1	76.2	20.0	3.8
Judge 2	67.6	28.6	3.8
Judgment on creativity			
Drawing task: Running Person			
Judge 2	60.0	21.9	18.1
Judge 3	46.7	37.1	16.2
Drawing task: House			
Judge 2	49.5	22.9	27.6
Judge 3	32.4	32.4	35.2

Table 2

Intra- and Inter-Judge Agreement on Ratings of Students' Drawing Abilities and Creativity

	Measures of Agreement			
	Pearson χ^2 (4, *N*=105)	Cramer's *V*	Kappa	% Concordance
Judgment on drawing abilities				
Inter-Judge Agreement (Judges 1 and 2)				
Running Person	83.60****	.63****	.32****	65.8
House	62.26****	.54****	.26***	68.6
Intra-Judge Agreement (two drawings)				
Judge 1	36.41****	.42****	.32****	75.2
Judge 2	43.95****	.46****	.36****	66.7
Judgment on creativity				
Inter-Judge Agreement (Judges 2 and 3)				
Running Person	9.24	.21	.14*	47.7
House	21.18****	.32****	.19***	45.7
Intra-Judge Agreement (two drawings)				
Judge 2	7.69	.19	.15*	48.5
Judge 3	13.96**	.26**	.21***	46.7

**** p<.001; *** p<.005; ** p<.01; * p<.05.

Table 3

Cross-Tabulation of Drawings on Drawing Abilities and Creativity by Pairs of Judges (N = 105)

		Rating by Judge 2					
		House			Running person		
		Low	Med	High	Low	Med	High
Drawing ability							
Rating by Judge 1	Low	60	20	0	53	30	0
	Med	11	9	1	4	11	2
	High	0	1	3	0	0	5
Creativity							
Rating by Judge 3	Low	24	7	3	34	10	5
	Med	20	6	8	23	9	7
	High	8	11	18	6	4	7

Table 4

Correlations of Drawing Abilities and Creativity of Students with Their Artistic Characteristics, and Drawing Activities (n=102)

			Controlling for Age	
	Drawing Abilities	Creativity	Drawing Abilities	Creativity
Gender	.11	.02	.06	.01
Age	.33***	.10	-	-
Artistic characteristics	.30**	.15	.37***	.16
Drawing activities				
Like drawing in spare time	.24*	.09	.36***	.12
Enjoy drawing lessons	.19	.12	.26**	.14
Take extra drawing lessons	.09	.02	.14	.04
Take part in competitions	.37***	-.01	.36***	-.02
Win awards	.43***	.11	.46***	.10

Note. Artistic characteristics were assessed by students' self-ratings using the Artistic Characteristics Scale of the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli et al., 1976).
Drawing activities were assessed using an activity checklist.
* $p<.05$; ** $p<.01$; *** $p<.001$ (2-tailed).

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