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Sex differences in expressive drawing

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ABSTRACT

We examined sex differences in expressive drawings produced by 105 boys and 105 girls aged 9–15 years. The drawings were classified according to the type of expressive strategy used to depict emotion (literal, content, abstract, or any combination of these), and rated according to the complexity of that strategy. A creative/divergent thinking task (figural form) was used to assess the relationship between expressive drawing and figural creativity. As predicted, girls scored higher than boys on the expressive drawing task. Specifically, girls relied less often on literal strategies alone and were more likely to combine literal expression with metaphorical (content and abstract) expression than boys. There was a linear relationship between expressive drawing and divergent thinking scores. These results are consistent with the idea that boys and girls differ in the expressive component of emotion, and suggest that these sex differences extend to the expressive drawing domain. They also suggest that divergent thinking may be involved in the ability to draw expressively.

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1. Introduction

Drawings produced by school-aged children are, without doubt, *representational*, in that they convey information about the figurative aspects of objects (e.g., people, flowers, cars) or scenes (e.g., a person riding a horse), in a more or less visually realistic way, depending on the child's age. Drawings can also be *expressive*, conveying information about psychological moods or emotions (e.g., a person smiling, or a countryside scene with animals and children playing, both suggesting a happy mood). Despite the large body of evidence suggesting that there are differences between the representational drawings made by boys and those made by girls (Cox, 1992; Feinburg, 1979; Flannery & Watson, 1995; Lijima, Arikawa, Minamoto, & Arai, 2001; Turgeon, 2008), little is known about whether similar differences exist in expressive drawings. Accordingly, based on established sex differences in the expressive component of emotion (Brody & Hall, 1993; Kring & Gordon, 1998; McClure, 2000; Vigil, 2009), the present study tested the hypothesis that boys and girls also differ in their production of expressive drawings.

Representational drawing has been the focus of extensive research, notably regarding sex differences in drawings produced by school-aged children. These differences have been noted with

regard to picture content (Feinburg, 1979; Lijima et al., 2001; Turgeon, 2008), in that boys include more vehicles and buildings in their undirected drawings, whereas girls draw more animals, domestic scenes, and flowers. Fantasy drawings by boys tend to feature monsters and dinosaurs, whereas girls prefer to portray kings and queens. The valence and realism of the depicted themes has also been shown to differ between the sexes (Feinburg, 1979; Flannery & Watson, 1995; Silver, 1993): boys tend to depict more violent and aggressive scenes, with a low level of realism, whereas girls portray more peaceful and realistic scenes. Sex differences have also been observed in figure composition (Lijima et al., 2001), with boys using more aerial or bird's eye views and girls using more raw or frontal arrangements in their drawings. Finally, color use has been shown to vary in representational drawings made by boys and girls (Lijima et al., 2001; Milne & Greenway, 1999; Richards & Ross, 1967; Turgeon, 2008): girls use a broader and warmer (pink, purple) range of colors, whereas boys employ fewer, colder (dark) ones. These sex differences may result either from biological differences (e.g., hormones and the level of prenatal androgen exposure; see Lijima et al., 2001) or from psycho-cultural differences (e.g., social pressure and gender-related education; see Flannery & Watson, 1995) in the development of boys and girls.

Expressive drawing has been a much neglected area of research, at least as far as sex differences are concerned, and in a recent review on the development of expressive drawing, Jolley (2010) did not so much as mention sex-related variations. We cannot, therefore, exclude the possibility that the lack of reported sex differences is simply the result of a lack of assessment per se. Most

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research studies of expressive drawing have focused on age-related differences, showing that expressive drawing ability develops mainly at the end of childhood, namely after 9–10 years (Bonoti & Misailidi, 2006; Carothers & Gardner, 1979; Ives, 1984; Jolley, Fenn, & Jones, 2004; Picard, Brechet, & Baldy, 2007; Picard & Lebaz, 2010; Winston, Kenyon, Stewardson, & Lepine, 1995).

Improvements in expressive drawing ability have been shown to result from the increasing use of content expression and abstract expression, with a reduced reliance on literal expression alone. The latter depicts emotion in a simple and direct way, through facial expression cues (e.g., frowning mouth) or the personification of nonhuman topics. Content expression, a comparatively more complex strategy, refers to the use of figurative cues (e.g., rain and clouds) that connote emotion in an indirect, more subtle and contextualized way. Finally, abstract expression, a sophisticated strategy, expresses emotion through the use of non-figurative cues (e.g., dark colors, drooping lines, small-sized objects), involving the reworking of the drawing's formal properties (color, line and size). Abstract expression has been shown to be mastered and used later than content expression (Jolley et al., 2004).

We tentatively hypothesized that boys and girls would differ in their ability to produce expressive drawings, notably regarding the type and complexity of the expressive strategies they employed. This hypothesis was based on two premises: boys and girls are known to differ in emotional expressivity (Brody & Hall, 1993; Kring & Gordon, 1998; McClure, 2000; Vigil, 2009), and drawing is a powerful nonverbal medium for conveying emotions (Gombrich, 1972). We reasoned that if sex differences observed in the expressive component of emotion extended to drawing behavior, they would probably manifest themselves in expressive drawing. More specifically, consistent with the observation that women appear to be more expressive than men in most emotions (including sadness and happiness) and on a variety of measures (self-report, physiology, behavior, or specific brain activation), we expected girls to outperform boys in expressive drawing behavior.

We tested this hypothesis by asking young people (boys and girls) aged 9–15 years to produce expressive drawings of familiar topics. The age range was specifically selected to coincide with the period of developing expressive drawing ability. We rated the children's drawings according to the type and complexity of the underlying expressive strategy. We predicted that there would be a main effect of sex, with girls scoring higher than boys on expressive drawings (Hypothesis 1). In line with the literature on expressive drawing (Ives, 1984; Jolley et al., 2004), we also predicted that there would be a main effect of age, with scores increasing between 9 and 15 years (Hypothesis 2).

In addition, we tested a specific hypothesis according to which divergent thinking (i.e., the kind of thinking that goes off in different directions, resulting in several possible ideas, solutions, or products; see Guilford, 1959) plays a central role in generating expressive drawings (see Jolley, 2010, p. 64). To that end, we administered an additional task of figural creativity (Torrance's parallel lines subtest; Torrance, 1966) to participants, which yielded scores of fluency (ability to produce a number of ideas), flexibility (ability to produce ideas belonging to a variety of categories), originality (ability to produce infrequent ideas), and elaboration (ability to develop and elaborate on ideas). The Torrance Tests of Creative Thinking (TTCT) are the most widely used instruments for assessing creative potential, and provide a reliable assessment of divergent thinking in children and young adolescents (see Kim, 2006). In line with the literature on creativity (Lubart & Stenberg, 1998; Stenberg, 1999), we expected figural creativity scores to increase with age, being lower at nine years than at 15 (Hypothesis 3). We also predicted that figural creativity scores would be significant predictors of expressive drawing scores (Hypothesis 4).

2. Method

2.1. Participants

A total of 210 children and adolescents volunteered to take part in the study. They were divided into seven age groups (15 boys and 15 girls in each group): 8–9 years ($n = 30$, $M = 8$ years 5 months, $SD = 4$ months), 9–10 years ($n = 30$, $M = 9;2$, $SD = 4$), 10–11 years ($n = 30$, $M = 10;3$, $SD = 7$), 11–12 years ($n = 30$, $M = 11;4$, $SD = 4$), 12–13 years ($n = 30$, $M = 12;5$, $SD = 5$), 13–14 years ($n = 30$, $M = 13;6$, $SD = 5$), and 14–15 years ($n = 30$, $M = 14;4$, $SD = 5$). All the participants attended state schools in a middle-class district of a southern French city. None of them suffered from a known mood disorder or a known psychomotor drawing or handwriting disorder (as deduced from verbal reports of both parents and teachers). The participants were mostly right-handed (88%). They were observed in small groups (3–4 participants) in a quiet room in their school. Written parental consent was obtained for each participant and the study was carried out in accordance with the Declaration of Helsinki – Sixth Revision (2008).

2.2. Materials

The materials consisted of the 'parallel lines' subtest of the TTCT (Figural Form A; Torrance, 1966), white sheets of paper, a standard writing pencil, and nine crayons (black, brown, green, blue, red, purple, orange, yellow, and pink).

2.3. Procedure

Participants began by performing the parallel lines subtest, where they had to turn sets of two parallel lines into as many drawings as possible. The precise instructions were "To start with, let's see how many different drawings you can make with these two parallel lines. You can add things (lines, shapes, etc.) to the lines (above, below, inside or outside) in order to make your drawings. Produce as many different drawings as you can in 10 min, and give a title to each drawing". Participants completed the test using the pencil.

Afterwards, they were asked to draw a house and a tree in three different versions (normal first, then happy and sad). These topics have been used in previous studies (e.g., Ives, 1984; Winston et al., 1995), and also feature in several projective drawing tests (e.g., Buck, 1948). Participants were free to use the crayons as they wished. The order of presentation of the two topics was counter-balanced across participants, as well as the order in which they were asked to draw the happy and sad versions. The specific instructions were "Now imagine that the house (tree) is very happy (sad). Can you draw it, then tell us how you made it look happy (sad)?" There was no time limit on the expressive drawing task. The full session lasted 30 min at the most per participant.

2.4. Coding criteria for drawings

The raw number of relevant ideas produced in response to the parallel lines subtest was used as an indicator of fluency. Flexibility was scored as the number of different categories of ideas. Originality (based on the number of statistically infrequent ideas) and elaboration (based on the number of details added to elaborate on ideas) were also measured.

Happy and sad drawings were classified according to the type of expressive strategy that was used (literal, content, abstract, or any combination of these; see Ives, 1984). In order to improve coding accuracy for each expressive drawing, the normal version served as a baseline for objectively detecting the changes introduced into

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