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emotion in children's art

do young children understand the emotions expressed in other children's drawings?

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ABSTRACT

This study examined developmental changes in children's ability to understand the emotions expressed in other children's drawings. Eighty participants, at each of four age groups – three, four, five and six years – were presented with a series of child drawings, each expressing a different emotion (happiness, sadness, anger or fear). All drawings had been previously rated by adult judges on an emotion-intensity scale as being good exemplars of the emotions examined. Next, participants were shown pictures of child artists each expressing one of the designated emotions on her/his face and were instructed to identify the artist who created each drawing. The results showed that: (i) by age three, children demonstrated an understanding of the emotions expressed in drawings; (ii) happiness, sadness and fear were the emotions most easily recognized by participants. Overall, these results provide support for the assertion that the ability to understand the emotional meaning of drawings is present from the preschool years.

KEYWORDS *children's drawings, aesthetic development, emotion*

The development of children's ability to understand drawings has attracted the interest of many researchers in recent years. This research has largely focused on children's ability to appreciate drawings as representations of real world objects and to judge whether a drawing is a good representation of what it depicts (Adi-Japha et al., 1998; DeLoache, 1991; DeLoache and Burns, 1994; Dow and Pick, 1992; Robinson et al., 1994; Thomas et al., 1994). In contrast, only a few studies have examined children's ability to understand the emotions expressed in drawings.

Parsons (1987) was the first to emphasize the role of emotion in children's understanding of art. He proposed that the development of aesthetic appreciation proceeds through a sequence of five stages, each stage representing an advance on the previous one. In Parsons's model, young children are bound to interpret drawings in terms of the world represented in them. Only much later (between the ages of 10 and 14 years), they begin to become interested in drawing expressiveness and to appeal to the emotional expressions that drawings convey. Thus, according to Parsons (1987) the ability to understand the emotions expressed in a drawing constitutes a stage beyond its literal (representational) interpretation (Jolley et al., 1998).

Parsons's (1987) proposals were supported by some early studies on children's ability to appreciate the emotions expressed in adults' drawings (Carothers and Gardner, 1979; Winner et al., 1986). In one of these studies, Carothers and Gardner (1979) presented children with incomplete pictures depicting a happy or a sad man and asked them to complete the pictures by choosing one of two alternatives: i) a 'sad' drawing depicting a drooping leafless tree and a wilted flower; and ii) a 'happy' drawing depicting an upright tree teeming with leaves and a blooming flower. Until the age of 10–12 years, children were not able to choose the correct drawing to complete the pictures. These findings were corroborated in a study by Winner et al. (1986), who found that the ability to understand the emotions expressed in abstract paintings develops around the age of nine years.

However, more recent studies have shown that even young children are sensitive to the emotions expressed in museum art. Callaghan (1997) presented children aged five to 11 years and adults with a series of emotionally expressive adult paintings encompassing a range of artistic styles, from abstract to realist. Children were also presented with the pictures of adult-artists, each displaying a different emotion on her/his face (happiness, sadness, excitement and calmness). Callaghan asked children to match paintings with one of the artists. The results showed that from five years onwards children's performance was above chance, and with increasing age their judgments of the emotions expressed in the paintings became similar to those of adults.

In a further study, Callaghan (2000) modified her original task so as to make it more appealing to young children. In the new task, three- to five-year-old children were asked to help flannel bears, whose faces were made to look happy, sad, excited or calm, to choose paintings for their houses. First, children were presented with five postcards with adult paintings (four of which conveyed an emotion that matched the bear's emotional state and one that did not) and watched the experimenter modelling the appropriate choice three times. Then, children were asked to help the bear by choosing one painting from the remaining two. All children, even the three-year-olds, made the correct choices.

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Callaghan (2000) interpreted these results as evidence that from as early as three years children are able to recognize the emotions expressed in paintings, if they are scaffolded by an adult who adopts an aesthetic stance towards paintings.

In summary, studies examining children's understanding of the emotions expressed in drawings have yielded conflicting results. Some studies report that this ability develops around the age of nine to 12 years, whereas others report that from as early as five years and even by three years when scaffolded by an adult who models correct choices, children are able to understand the emotions expressed in drawings. The variability in the results may be due to differences in the task demands of different studies. First, in Carothers and Gardner's (1979) as well as in Winner et al.'s (1986) study, abstract drawings were used as stimuli. It is possible that abstract stimuli may lead to an underestimation of young children's true understanding, since it has been documented that children prefer realist to abstract art[1] (Child, 1971; Child and Iwao, 1973; Gardner and Winner, 1976; Ramsey, 1982, 1989; Winner, 1982). Second, in Callaghan's (2000) study a forced-choice task was used requiring children to associate the picture of one artist to one of two drawings. In such a forced-choice task, young children may have perceived the designated emotion in the selected picture or merely a different emotion in the non-selected picture. Using only two pictures, therefore, may result in an overestimation of children's competence.

the present study

Although our knowledge of children's ability to understand the emotions expressed in drawings has been enhanced by these lines of research, prior investigations have not addressed the question of whether children are sensitive to the emotions expressed in other children's drawings. It is widely acknowledged that children's drawings convey emotion in their bold use of colour and line (Davis, 1997; Golomb, 1992; Rosenblatt and Winner, 1988). So prominent is this characteristic that young children's drawings are often compared by psychologists (Gardner, 1980; Gardner and Winner, 1982; Golomb, 1992; Rosenblatt and Winner, 1988), art educators (Lowenfeld and Brittain, 1970) as well as art critics (Fineberg, 1997) to those of great artists, such as Picasso, Miro and Klee.

The aim of the present study was to examine developmental changes in children's ability to understand the emotions expressed in other children's drawings. The task used in this study was a three-alternative forced-choice discrimination paradigm similar to the paradigm developed by Callaghan (1997, 2000). Children were presented with photographs of 'child artists' demonstrating one of the emotions: happiness, sadness, anger or fear on their faces. Following the presentation of each photograph, children were shown three child drawings

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that saliently expressed one of the target emotions (see Method for saliency criteria) and were asked to select the drawing that matched the emotional state of the child artist in the photograph.

Compared to previous studies, the present task had the following advantages. a) Children were presented with stimuli (children's drawings) that clearly were more personally relevant in relation to the unfamiliar stimuli (adult paintings) used in earlier research. Moreover, because children's drawings are less abstract and more realistic than adult paintings, they should stimulate young children's attention and interest to a greater degree. b) Children were presented simultaneously with three drawings each expressing a different emotion and were asked to choose the drawing that matched the artist's emotional state (chance for choosing the correct drawing was 1:3 or 33%). This experimental manipulation permits an assessment of children's ability not only to understand but also to discriminate among different emotions expressed in children's drawings (Freeman, 1991; Jolley et al., 1998). On the other hand, it constitutes a more stringent measure compared to Callaghan's matching task (2000) in which children had to select the designated emotion from two paintings – one expressing the appropriate emotion and one expressing an alternate emotion (chance for choosing the correct painting was 1:2 or 50%).

Furthermore, to ensure that all children understood the emotions that were examined in the present study, prior to the drawing task, two emotion tasks were administered. The tasks assessed children's understanding of the four emotions examined (happiness, sadness, anger and fear) and made it more likely that the necessary emotion terms would be accessible to children.

Taking into account children's familiarity with the drawings produced by themselves and by their peers, we anticipated that they will be more aware of the expressive properties of these creations than they have been for adults' artwork which is relatively unfamiliar to them. Thus, we predicted that children would show a better understanding of the emotions conveyed in drawings than that reported in the earlier studies and that their competence would increase with older age.

With regard to the different emotions expressed in the drawings, we anticipated that children would more readily recognize happy drawings compared to drawings intended to express sadness, fear or anger, given the results of previous studies reporting that they are less likely to read negative than positive emotions into pictures (Jolley and Thomas, 1995; Parsons, 1987). This prediction is also in accordance with studies showing that children recognize and label positive emotional expressions earlier than negative ones (Denham and Couchoud, 1990) as well as with studies reporting that young children have a tendency to draw more 'happy faces' than faces expressing other emotions (Buckalew and Bell, 1985; Zagorska, 1996).

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method

participants

Participants were 80 three- to six-year-old children (40 boys and 40 girls). The sample was divided in four age groups: three-year-olds (M = 3 years and 6 months, SD = 3.2 months), four-year-olds (M = 4 years and 5 months, SD = 2.5 months), five-year-olds (M = 5 years 3 months, SD = 3.7 months) and six-year-olds (M = 6 years and 4 months, SD = 3.08 months). Boys and girls were equally represented in each age group. Children were recruited from one nursery and one primary school in an urban area serving a broad cross-section of the community in terms of socioeconomic background.

tasks

preliminary tasks: recognition of emotions expressed in faces and stories

Two emotion tasks were presented to children prior to the main task in order to ensure that they could understand and distinguish the emotions under investigation. In the first task, children were presented with four colour 5 × 8 in. (127 × 203 mm) photographs, each depicting a child (two boys and two girls) expressing one of the emotions: happiness, sadness, fear or anger on her/his face. The pictures were presented simultaneously and each child was asked: 'Which child feels X (emotion)?'. The same question was repeated for all four emotions. Questions were asked in a random order. All children identified correctly the emotional expressions in the four pictures.

In the second task, children were presented with four stories describing an event that was bound to cause a specific emotion (happiness, sadness, fear or anger) in the child protagonist (e.g. the story for happiness described the protagonist receiving a present and the story for sadness described the protagonist losing his favourite toy).[2] Following the presentation of each story, children were asked how the protagonist felt at the end of the story: 'How do you think that X [protagonist's name] feels?'. All children predicted correctly the emotion that each protagonist would experience in the respective situation.

main task: identification of the emotions expressed in children's drawings

The emotion stimuli were four 5 × 8 in. colour photographs each depicting a child (boy or girl) portraying one of the four emotions. The drawing stimuli were 12 coloured child drawings (drawn on a white A4 paper) chosen from a larger sample of 330 pieces. Three expressed happiness, three sadness, three anger and three fear. The drawings had been collected in a separate study (Bonoti

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and Misailidi, 2006) in which 55 five- to nine-year-old children were instructed to create drawings expressing one of the emotions: happiness, sadness, fear and anger as well drawings that did not express any emotion. The drawings depicted a wide range of emotional contents, including a sunny day in the forest (happiness), angular lines (anger), a cemetery (sadness), a shark (fear). However, they did not contain any human figures, as children had been instructed not to include humans in their pictures. This constraint was considered important in order to avoid the depiction of emotions in the face (e.g. smile, tears) or bodies of the drawn figures that might capture children's attention at the expense of the drawing's overall emotional expressiveness.

Each of these drawings was then rated by 52 adults on a five-point scale as to how well it expressed the intended emotion (1 not at all to 5 very much). The three drawings from each emotion category that had received the highest score in adults' rating were chosen to be used as stimuli in the main task. Each one of these 12 drawings had a reliability rating of at least 70 per cent.

procedure

Children were tested individually in a familiar quiet room near their classroom. Prior to the main task, the two preliminary emotion tasks were administered. Next, children were told that they were going to see the photographs of some children and the drawings these children had produced. The experimental procedure consisted of four trials, one trial for each of the target emotions (happiness, sadness, anger and fear). At the start of each trial, the photograph of a child expressing one of the target emotions was placed on the table in front of the child. Then, blocks of three drawings were laid out underneath the photograph: one expressing the target emotion and two foil drawings, each expressing a different (from the target) emotion. On each trial, the position of the target drawing (left, middle, right) was randomly chosen, with the restriction that the correct picture was not presented in the same position for more than two consecutive trials. The instructions given were the following: 'Here we can see the happy child (pointing to the photograph). Which of these three drawings, do you think was created by this child while (s)he was happy?'. The same procedure was followed for the rest three trials. The instructions were exactly the same for all four trials, with the substitution of the word 'happy' with the words 'sad', 'angry' and 'scared' in the question. The order of presentation of the four photographs (target emotions) was randomized across children. Moreover, four orders for the presentation of the blocks of drawings (target and foils) were randomly chosen from all possible orders and the orders assigned were administered in a counterbalanced order within each age group.

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results

scoring

Participants' responses were judged correct and were given 1 point, if there was a match between the emotion expressed in the drawing (i.e. happiness, sadness, anger, fear) with the emotion expressed by the child-artist in the photograph. All other answers were given a 0 score. Each child's correct responses across the four emotion drawings were summed to form a total score ranging from 0 (all responses incorrect) to 4 (all responses correct).

group and emotion differences

Data were analysed with a 4 × 4 mixed-design ANOVA in which age (three, four, five and six years) was entered as the between subjects factor and correct responses to each of the four emotions expressed in the drawings (happiness, sadness, anger and fear) as the repeated measure. In order to control for Type I error, t-tests with Bonferroni adjustments[3] were used to follow up on significant effects. For each follow-up, alpha was divided by the number of t-tests conducted, with overall alpha being set at 0.05.

A significant main effect for age was obtained, $F(3, 76) = 5.66$, $p < 0.001$. Post hoc t-test pairwise comparisons (a = 0.5/6) indicated that overall the six-year-olds' ($M = 3.55$, SD = 0.60) had higher scores than the four-year-olds ($M = 2.80$, SD = 1.05) and the three-year-olds ($M = 2.45$, SD = 0.82), but not from the five-year-olds ($M = 3.15$, SD = 0.98). There was also evidence to suggest that the five-year-olds performed better than the three-year olds. The two younger groups (three-year-olds and four-year-olds), however, did not differ from one another. These age differences are illustrated in Figure 1.

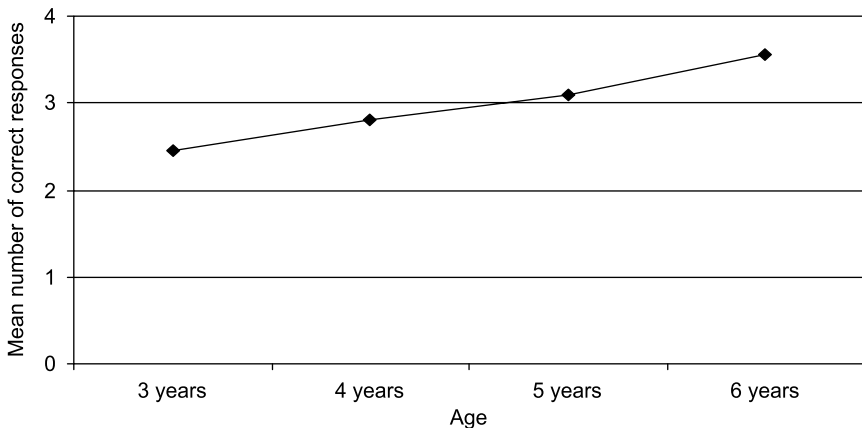**figure 1** mean number of total correct scores (out of 4) as a function of age

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table 1 mean proportion (and SDs) of correct responses for each target emotion as a function of emotion and age

| Age | Emotions | | | |
	Sadness	Happiness	Anger	Fear
Three years	0.55 (0.51)	0.90 (0.30)	0.30 (0.47)	0.70 (0.47)
Four years	0.45 (0.51)	0.95 (0.22)	0.60 (0.50)	0.80 (0.50)
Five years	0.55 (0.51)	0.85 (0.36)	0.85 (0.36)	0.90 (0.36)
Six years	0.65 (0.48)	1.00 (0.00)	0.95 (0.22)	0.95 (0.22)
Total	0.55 (0.50)	0.92 (0.26)	0.67 (0.47)	0.83 (0.47)

The analysis also revealed a main effect for emotion, $F (3, 228) = 15.72$, $p < 0.001$. This indicates that overall children's performance varied as a function of the particular emotion expressed in the drawings. The mean proportion of correct responses in each emotion drawing is shown in Table 1.

The main effects were, however, qualified by a significant Age × Emotion interaction, $F (3, 76) = 4.09$, $p < 0.025$. This interaction was decomposed by analysing the single main effect of age for each type of emotion drawing separately. The results showed that the four groups did not differ significantly in the drawings expressing happiness, fear and sadness (all p's = n.s.). The only significant difference was observed in the anger drawings, $F (3, 79) = 10.23$, $p < 0.001$.

comparisons to chance

A series of Bonferroni-corrected one sample t tests were also performed to examine whether children's scores on each of the four types of emotion drawings were different from the chance level of 0.033 (1:3)[4] (a = 0.33/4). The results revealed that children at all age groups scored significantly higher than chance in the happiness, sadness and fear drawings. As regards the anger drawings, the four, five and six-year-old children performed above chance, but the three-year-olds did not, $t(19) = 2.07$, n.s.

discussion

The present study aimed to investigate three- to six-year-old children's understanding of the emotions expressed in other children's drawings. The results suggest that during the preschool years, children become increasingly able to recognize and differentiate the emotions expressed in drawings. Although there was some variation in performance depending on the individual emotions examined, overall participants in all age groups understood that drawings express the emotions of their creators.

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These results are in variance with previous work (Carothers and Gardner, 1979; Winner et al., 1986) which showed that children do not appreciate the emotions expressed in pictures before the age of nine to 12 years. Stimulus differences may be the reason for this variation. Carothers and Gardner (1979) as well as Winner et al. (1986) had used abstract paintings made by adults. We, in contrast, used children's drawings. We propose that: (i) children's familiarity with these stimuli, (ii) the realism that characterizes children's drawings, which has been found to attract young children's interest, as well as (iii) the power of children's drawings to express emotions, may be the factors responsible for young children's improved performance in the present study.

On the other hand, our results corroborate those obtained by Callaghan (2000) by showing that even preschool children have the ability to understand the emotional expressiveness of drawings. However, the present study has shown that young children can accurately recognize the emotions expressed in drawings without the scaffolding provided by social interaction with an adult. Callaghan (2000) has argued that young children need to observe an adult taking an aesthetic stance towards paintings in order to adopt themselves an aesthetic stance towards these paintings. In her study, three-year-old children benefited from only a brief exposure to an adult taking an aesthetic stance towards paintings. Without this scaffolding three-year-olds were not able to make judgments of the paintings' emotional expressiveness. Our results show that it is the stimuli rather than social scaffolding that facilitate children's judgments of emotional expressiveness in drawings. Social scaffolding may be necessary to judge the expressiveness of adult paintings with which children are relatively unfamiliar, but probably it is not important when children are exposed to stimuli with which are familiar, such as other children's drawings.

As regards young children's sensitivity to the different emotions expressed in other children's drawings, the results showed that happiness, sadness and fear were the easiest emotions to detect while anger was more difficult to detect. Moreover, as the age of the participants increased, the likelihood that they would correctly identify anger in drawings increased as well. This finding partly supports our hypothesis that children would more readily recognize positive in relation to negative emotions in drawings and it is in line with the results of Jolley and Thomas (1995) who found that sensitivity to metaphorical expression of emotion develops at different rates for different emotions. However, we cannot rule out that differences between the drawings expressing different emotions may be the factor responsible for the differences in children's performances. Although we used only drawings with high interrater reliability, it is possible that some drawings may have been clearer examples of particular artist emotions. Why happiness, sadness and fear are more readily recognized by children in drawings than anger is thus an issue that needs further investigation.

A number of limitations may restrict the generalizability of the present findings. First, the forced-choice task that was used may have primed young children to interpret drawings as emotionally expressive. It is plausible that young children might interpret the drawings primarily as representations of their contents, rather as expressions of internally felt emotional states, if a different task had been used. Second, and relatedly, the three-alternative forced-choice task may have prevented children from attributing any other emotion to the drawings. If a child interprets the three drawings, say, as expressing fear, anger and sadness, yet s/he is presented with a picture of a person displaying a happy emotional expression, then the child is forced to interpret one of the drawings in terms of this emotion erroneously. In spite of these limitations, the forced-choice task seemed to us to be more appropriate than other methods, such as free-response tasks. Several studies have shown that preschool children perform poorly on tasks that require them to label emotional expressions (Widen and Russell, 2003). Free-response tasks are also very dependent on the child's emotion vocabulary and her/his ability to retrieve the appropriate emotion label (Markham and Adams, 1992).

The third limitation of this study is more a statement of caution about the interpretation of these results rather than a limitation in generalizability. Specifically, the study did not assess how children judge the emotional expressiveness of drawings. Callaghan (1997) has reported that young children tend to rely more on subject matter and less on the formal properties of lines and colours, when they judge the particular emotion expressed in a drawing. The only adequate way of answering this question would have been to ask children to justify their responses verbally (Jolley and Thomas, 1995). However, we assumed that the young age of our participants and their subsequent limited verbal capacity would have not permitted to uncover the real reasons for their judgments.

In conclusion, the present study's findings provide preliminary evidence in support of the hypothesis that the ability to understand the emotions expressed in drawings begins in the preschool years. The possibility that young children's performance in this task may be partly attributed to the method used invites future research to explore the same question with different methodologies. Future research should also explore the impact of factors such as subject matter, lines, colours as well as the novelty, complexity or representationality of a drawing on children's judgments of emotion in drawings.

acknowledgements

notes

1. This preference for realism in pictures seems to originate from young children's tendency to concentrate on drawings' subject matter (Parsons, 1987). In other

words, young children interpret pictures based mostly on their subject matter and, therefore, prefer those that present an easily recognizable and meaningful content.

2. The stories were based on the work of Widen and Russell (2003).

3. One might argue that forcing children to choose a single drawing from a limited number of emotion drawings might artificially inflate recognition accuracy. For example, if a child was presented with a picture of a person displaying happiness and, say, understood the sadness and anger expressed in the two foil drawings, then, it would be likely that s/he would choose the third drawing (expressing happiness) simply by excluding the other two drawings and, not necessarily because s/he understood the emotion this drawing expressed. To address the non-independence of these comparisons, we used the Bonferroni correction, which acts as a conservative correction for inflated alpha (Maxwell and Delaney, 1990).

4. Since children had to choose one of three drawings for each emotion, the level that would be expected if children randomly matched a drawing to a given emotion would be 0.33.

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