

The effect of three different educational approaches on children's drawing ability: Steiner, Montessori and traditional

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Background. Although there is a national curriculum for art education in the UK there are also alternative approaches in the private sector. This paper addresses the issue of the effect of these approaches on children's drawing ability.

Aim. To compare the drawing ability in three drawing tasks of children in Steiner, Montessori and traditional schools.

Sample. The participants were 60 school children between the ages of 5;11 and 7;2. Twenty children were tested in each type of school.

Method. Each child completed three drawings: a free drawing, a scene and an observational drawing.

Results. As predicted, the free and scene drawings of children in the Steiner school were rated more highly than those of children in Montessori and traditional schools. Steiner children's use of colour was also rated more highly, although they did not use more colours than the other children. Steiner children used significantly more fantasy topics in their free drawings. Further observation indicated that the Steiner children were better at using the whole page and organising their drawings into a scene; their drawings were also more detailed. Contrary to previous research Montessori children did not draw more inanimate objects and geometrical shapes or fewer people than other children. Also, contrary to the prediction, Steiner children were significantly better rather than worse than other children at observational drawing.

Conclusion. The results suggest that the approach to art education in Steiner schools is conducive not only to more highly rated imaginative drawings in terms of general drawing ability and use of colour but also to more accurate and detailed observational drawings.

Interest in children's art goes back for over a century, originating in Cooke's *Our art teaching and children's nature* (1886) and Ricci's *The art of little children* (1887). This

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interest waned, however, in relation to the actual teaching of art in the classroom. In 1982, the Calouste Gulbenkian Foundation (1982) reported that art in schools was given little attention, often being seen as a leisure time pursuit. A few years later a Department of Education and Science report (1990) complained about a lack of informed art lessons in primary schools. Art is sometimes used as a filler activity and this detracts from its credibility as an educational subject (Hargreaves & Galton, 1992).

Art, however, is important in children's development and education since it is not only a means of expression (Löwenfeld, 1957) but also an important starting point for many educational skills (Jameson, 1968). It can heighten the children's awareness of sensory experience and sharpen their powers of observation (Department of Education and Science, 1978). It may aid intellectual and aesthetic development and the exploration of values and can promote practical and perceptual skills (National Curriculum Council, 1990).

Most teachers are aware that art is a significant aspect and a basic tool of education for all children (Department of Education and Science, 1978). It became a foundation subject in the national curriculum and a statutory subject for maintained schools in 1992 (Office for Standards in Education, 1993). The national curriculum for art (Department of Education, 1995) set out a programme of study and most schools have made positive attempts to teach art to children aged 5–14 years, although many teachers have reported being hampered in this pursuit by their lack of expertise.

Traditional schools (both state and private) follow the national curriculum in relation to art education. In primary schools, each class has an art lesson at least once a week, usually for one hour; although art may be involved in many other lessons during the week this one hour is dedicated to art teaching and learning. The children are taught age-appropriate skills with a variety of types of materials, such as paints, charcoal, clay, crayons and pencils. Art activities include illustrating topic books, drawing and painting wall displays, colouring worksheets and free drawings. A balance is struck between the teaching of art skills and allowing children the freedom to paint and draw as they wish. The curriculum stresses the importance of recording observations and focuses on drawing. In fact, Thistlewood (1992) claims that observational drawing is the most important and dominant aspect of art education, as does Clement (1992) who sees it as 'the essential, core activity in art and design education, without which it is impossible to achieve meaningful work of quality' (p. 121).

There are, however, other educational approaches in which art is treated differently. Steiner and Montessori, two renowned alternative educators, advocated different if not contrasting ideas on the nurturing of active imagination and art. In spite of this, both believed in educating the child as a whole, not just the mind, but body and soul as well. Steiner based his educational ideas on 'Anthroposophy', the belief that a human is a three-fold being of body, soul and spirit (Wilkinson, 1993). His approach to education sees the young child as a child, not an incomplete adult, and still very close to heaven (Meighand, 1995). The Steiner-influenced classroom offers a secure and creative environment, full of natural objects designed to stimulate the child's imagination and desire to learn. Steiner's approach has strong links to humanistic psychology, being child-based and encouraging teaching which is 'warmed through with feeling' (Meighand, 1995, p. 48)

The focus in Steiner schools is 'artistic-imaginative' (Ginsburg, 1982). This does not

mean, though, that the aim is to train artists; rather, 'it is for developing the creative artistic ability which every person has within' (Nobel, 1997, p. 149). Children first experience art through painting on damp paper with water colours, which is supposed to develop artistic sensitivity and arouses a feeling for colour (Kummer, n.d.). Teaching often occurs through pictures in Steiner schools, and the children make their own text books to use in lessons, which are beautifully illustrated and decorated (Ginsburg, 1982). Fantasy is encouraged in conjunction with art, and fantasy play is promoted; children are told fairy tales and fables to feed their imagination (Almon, n.d.). No observational drawing occurs in the Steiner classroom, and children are discouraged from simply colouring in pre-drawn outlines (Wilkinson, 1993). The children are taught about the qualities of colours such as warm and cold, and that colours can be used to represent concepts such as good and evil (Edmunds, 1975). It is interesting that Steiner advocated the expressive use of colour, as some researchers (e.g., Löwenfeld & Brittain, 1970; Parsons, 1987) have argued that young children are concerned solely with the realistic use of colour and do not understand its expressive possibilities until much later on. However, other researchers (e.g., Gardner, 1970) have found that 7-year-olds *are* sensitive to the expressive use of colour and have provided evidence that 6-year-olds can, to some extent, use colour in an expressive way (Winston, Kenyon, Stewardson, & Lepine, 1995).

Montessori (1912) education, like Steiner's, has links with humanistic psychology. In the original Montessori philosophy, reality was imperative and emphasis was placed on learning real life and practical skills. The teacher was a passive instructor, avoiding interaction unless asked by the child. There was an indirect approach to teaching: foundations were merely laid and children were left free to initiate their own exploration and learning. Children in Montessori schools were given no formal lessons in drawing and art; copying and observational drawing were normally all that was advocated and, as children progressed, emphasis shifted to geometric drawing (Montessori, 1918). Montessori claimed that even young children spontaneously draw the outlines of the objects they see, and do not need to be taught how to do this (Montessori, 1965). Reality was continuously reinforced, and there was opposition to free drawing from imagination (Montessori, 1918). Free drawings only show that 'the eye of the child is uneducated, and the hand inert, the mind insensible alike to the beautiful and ugly' (p. 305), and Montessori positively reviled the 'hideous drawings which are exhibited in common schools as free drawings characteristic of childhood' (p. 304). She criticised psychologists for collecting these 'horrendous daubs' in an attempt to analyse the infant mind, stipulating that they only show 'intellectual lawlessness' (p. 305).

If children in Montessori schools engaged in free drawing they were discouraged from including fantasy elements, because fantasy was seen as a 'savage stage' of development (Montessori, 1965, p. 255), and children should be helped to overcome it. Montessori argued that imagination would flourish via truth and reality. However, in a study by Dreyer and Rigler (1969), in which Montessori and traditional nursery school children were assessed for cognitive performance, Montessori children were judged to be less creative than traditional nursery school children on a picture construction task (children were given a jelly bean shaped piece of red gummed paper, and were asked to create a picture incorporating it). All the children were also required to draw a free

choice picture. The Montessori children consistently chose not to draw people in their pictures but geometric forms instead; they also appeared more task-orientated than the nursery school children, who saw the study as a chance to be involved socially with an adult.

Nowadays the approach in most Montessori schools is less rigid than that originally advocated by Montessori herself and art is regarded as an important activity in its own right as well as an aid to learning about other topics in the curriculum (Merz, 1996; Schneider, 1996). The teacher has a more active role and, although drawing and painting from observation are still considered very important in developing children's visual and intellectual skills, free expression is also valued and encouraged. To the extent that a balance is struck between the more formal observational work and self-expression the modern approach to art education in the Montessori schools is perhaps closer to that in the traditional schools. Nevertheless, the emphasis in today's Montessori classroom is more on reality than fantasy so we might still expect to see differences in the artwork which the children produce.

In the present study children's drawings were investigated in three educational settings – a Steiner school, a Montessori school and a traditional school – in order to identify any differences in drawing ability within the different types of schools. Four main predictions were made, arising from the three different educational approaches. First, due to the emphasis on art and creativity in Steiner schools (for example, children being taught pictorially, producing and illustrating their own text books, emphasis on colour), Steiner children's drawing ability would be judged superior to those of other children. Secondly, it was predicted that Steiner children would show a more expressive use of colour in their drawings compared with other children, as well as using a greater number of colours. These first two hypotheses were tested with a free drawing (anything the child chose to draw) and a scene drawing (with specified elements in order to control for the content of the drawing) used by Cox, Perara, and Xu (1999).

Since fantasy is encouraged in Steiner schools, the third prediction was that the Steiner children would draw more fantasy items in their free drawing than would other children and that Montessori children in particular would draw fewer people and more inanimate objects and geometrical shapes (Dreyer & Rigler, 1969). The fourth prediction was that children in the traditional school and the Montessori school would gain higher scores for their observational drawing than would children in the Steiner school. Observational drawing is emphasised in traditional and Montessori schools but is not part of the Steiner approach. This hypothesis was tested with children's observational drawings of a plastic model of a man running, a task used by Cox, Perara, and Xu (1998) and yielding mean scores for each age group from 6 to 13 years.

Method

Participants

Sixty children in all were tested, 20 from each type of school. The numbers of boys and girls in each group were: Steiner, 9 boys, 11 girls; Montessori, 9 boys, 11 girls; traditional, 11 boys, 9 girls.

The mean age and standard deviation for the children in each group were: Steiner 7;2 (SD 7 months), Montessori 6;9 (SD 7 months), traditional 6;11 (SD 9 months). There

were no statistically significant differences among the ages of the children in the three groups ($F(2,57) = 2.35$, n.s.). It was also considered important to ensure that the children in the three schools were matched for intellectual ability. Since children's drawings have been shown to correlate more highly with non-verbal than verbal IQ test items (Abell, von Briesen & Watz, 1996; Gayton, Tavormina, Evans & Schuh, 1974) it was deemed appropriate to match the groups on Raven's Coloured Progressive Matrices (Raven, Court, & Raven, 1990), a well-known test of non-verbal reasoning ability for children aged between 5 and 11. The test was administered to each child individually. The maximum possible score on the test is 36. The mean score and standard deviation for each group were: Steiner 21 (SD 6), Montessori 23 (SD 5), traditional 21 (SD 5). A score of 21 is at the 75th percentile point for 7-year-olds; thus, the children in all three schools were above average for their age. However, there were no statistically significant differences among the scores in the three groups ($F(2,57) = .98$, n.s.). In summary, the three groups were similar in age and in level of non-verbal reasoning ability.

The schools

A private rather than a state traditional school was chosen, as it was recognised that parents sending their children to private, fee-paying schools, like Steiner and Montessori parents, have made a conscious decision not to send their children to a state school. To this extent parental attitudes were deemed to be similar; however, the fact that the parents in this study had chosen different kinds of private schools for their children also suggests some differences in attitude regarding the way their children should be educated. In order to reassure ourselves that the three schools were good exemplars of their respective educational approaches we questioned the teachers about their ideas on and practices in art education. We also noted the art materials available to the children and the displays and artwork in their classrooms in order to establish the school context of the children's work.

Steiner. Steiner teachers had received more artistic training than teachers receive in a PGCE course. Their skill in art teaching, then, is likely to be greater. This particular class teacher regarded art as a support for most lessons, e.g., the children were taught the alphabet pictorially, they produced their own books for geography and history and illustrated the stories they wrote. She felt that art allowed the children to explore and represent feelings; she did not approve of observational drawing. The available art materials were mainly water colours, thick block crayons and pencils, and naturally-found materials such as wood, feathers and leaves. The children did not use felt pens, or standard-thickness pencils or coloured pencils. The pictures on the walls were drawings and paintings produced by the children. There were many water colours in which the colours were merged and were meant to express the children's feelings when they painted them. It would appear that this class teacher (and indeed the school) adhered closely to the original Steiner approach.

Montessori. Teachers receive some art training on the Montessori training course, at a similar level to that on PGCE courses. This teacher believed that art and crafts provide excellent media for the development of the senses through finger painting, collage, glueing, modelling and building, all executed by manipulating materials with the hands. She considered that observational drawings and painting are very important

in developing visual and intellectual skills. However, she emphasised that a balance is struck between the formal art teaching and children's self-expression. In the classroom the available materials were paints, felt pens, coloured crayons and coloured paper. Scissors and glue were also available, as in the other two schools. The children's coloured crayon drawings of themselves and their families were displayed on one wall; the other walls had posters and topic displays (e.g., a topic on leaves). This teacher pointed out that there has been a shift in attitude since Montessori's day and her approach would appear to be in line with modern Montessori ideas.

Traditional. There is an integral art element in the primary years PGCE course. The teacher regarded art as an important part of development and that free drawings and paintings allow children the opportunity for self-expression. The children were involved in art and craft activities of some kind each day. Paint, felt pens, coloured crayons and coloured paper were all available in the classroom. The children's drawings and paintings covered most walls. Their collage work was included in a display on a 'what we wear' topic. This teacher, as well as others in the school, follows the national curriculum for art.

Materials

Each child completed three drawings on separate sheets of A4 white paper (taken from the same batch, so as to avoid raters being able to use variations in paper to discriminate drawings). Each child was provided with a set of 10 differently coloured felt tip pens for the free drawing and the scene drawing and an HB pencil and a plastic model of a running man for the observational drawing.

Procedure

Children were tested in groups of five, and completed all three tasks in one session. Participants were seated as far apart as possible so as to deter copying. The order of the tasks was the same for each group in each school, and children were allocated 15 minutes in which to complete each task.

Free drawing. Instructions: 'I would like you to draw me a picture from your own imagination, using the felt tip pens. It can be anything that you want to draw, but make sure that you thought of it and no-one else.'

Scene drawing. Instructions: 'I would like you to draw a picture for me. Listen carefully. I would like you to draw the sun shining in the sky, birds flying, and a house on a hill with a garden that has trees and flowers growing in it. Draw the *best* picture you can.' These instructions were left on a sheet of paper that all the children had access to; the children were also encouraged to ask if they were unsure about what to draw.

Observational drawing. Each child observed a plastic model man placed on the table. The man was running to the right from the child's vantage point. Instructions: 'Look at the man in front of you. He is running that way (point to the child's right). Look carefully at the man. I want you to draw exactly what you see. Draw the man running *that way* (point to the child's right). Draw the *best* picture you can.'

Results

Raters. Two undergraduate students – one male and one female – rated the drawings in this study. They were both in their early twenties. They had no knowledge of the age or sex of the children or which school they attended. The two raters rated the drawings independently.

Rating of drawing ability

Free drawing. Two independent raters rated the 60 free drawings. The raters were asked to rate the drawings for how good they thought they were. They were asked to rate each picture using a 1–5 scale: 1 = a very poor drawing, 2 = below average, 3 = average, 4 = above average, 5 = an excellent drawing (see Cox *et al.*, 1999). The raters were requested to use the full scale. They were given no specific criteria as previous research (e.g., Cox, Eames, & Cooke, 1994; Cox, Cooke, & Griffin, 1995) indicates that raters rate drawings similarly even when this very general instruction is given.

Pearson's product-moment correlation was used to assess the inter-rater reliability of the ratings. The overall inter-rater reliability was good (.89), as was the inter-rater reliability for the drawings rated from each individual school (Steiner .82, Montessori .92, and traditional .87). The raters agreed exactly on 75% of the drawings, and were within 1 point of each other for the remaining 25%. Each child's mean rating was calculated: Steiner children received a mean of 3.58 (SD 0.95), Montessori 2.68 (SD 0.94) and traditional 2.58 (SD 0.94). A one-way ANOVA revealed statistically significant differences in the ratings among the three schools ($F(2,57) = 6.27, p < .01$). Tukey's HSD showed that the Steiner children received significantly higher ratings for their free drawings than either Montessori or traditional school children ($ps < 0.01$); however, there was no significant difference between the ratings of Montessori and traditional school children. In terms of effect sizes (based on z -scores) the mean rating of the Steiner children was significantly higher than that of the Montessori children ($t(57) = 2.88, p < .01$) and of the traditional school children ($t(57) = 3.22, p < .01$) but there was no significant difference between the ratings of the Montessori and the traditional school children's ratings ($t(57) = 0.34, n.s.$).

Scene drawing. The two raters used the same 1–5 scale for the 60 scene drawings. The overall inter-rater reliability was good (.91), as was the inter-rater reliability for individual schools (.68, .85, .97, respectively). The raters agreed on 80% of the drawings and were within 1 point on 20%. Again, each child's mean rating was calculated: Steiner children received a mean of 3.53 (SD 0.70), Montessori a mean of 1.8 (SD 0.70), and traditional school children a mean of 2.48 (SD 0.88). A one-way ANOVA revealed a statistically significant difference in the ratings among the three types of school ($F(2,57) = 25.97, p < .001$). Tukey's HSD indicated that Steiner drawings received significantly higher ratings than Montessori or traditional school children ($ps < 0.01$), and that the traditional school children were rated significantly higher than Montessori ($p < .01$). In terms of effect sizes (based on z -scores) the mean rating of the Steiner children was significantly higher than that of the Montessori children ($t(57) = 7.31, p < .001$) and of the traditional school children ($t(57) = 4.38, p < .001$); the ratings of the traditional school children were significantly higher than those of the Montessori children ($t(57) = 2.92, p < .01$).

Rating of colour

Free drawing: Use of colour. The raters were asked to award each drawing a rating on a 1–5 scale according to use of colour within the picture (1 = ‘very poor use of colour’, 5 = ‘excellent use of colour’). In particular, they were asked to consider how expressive the children’s use of colour was. The overall inter-rater reliability was good (.90), as was the individual schools’ inter-rater reliability (.77, .93, .79, respectively). The raters agreed exactly on 78% of the drawings and were within 1 point of each other on the remaining 22%. Steiner children received a mean of 3.93 (SD 0.61), Montessori 3.25 (SD 0.92) and traditional 2.5 (SD 0.78). A one-way ANOVA revealed a statistically significant difference among the schools in their use of colour ($F(2,57) = 16.84$, $p < .001$). Tukey’s HSD showed that the Steiner drawings received significantly higher ratings for use of colour than Montessori or traditional ($ps < 0.01$), and that Montessori received significantly higher ratings than traditional ($p < .01$). In terms of effect sizes (based on z -scores) the mean rating of the Steiner children was significantly higher than that of the Montessori children ($t(57) = 2.85$, $p < .01$) and of the traditional school children ($t(57) = 5.80$, $p < .001$); the ratings of the Montessori children were significantly higher than those of the traditional school children ($t(57) = 2.95$, $p < .01$).

Scene drawing: Use of colour. The overall inter-rater reliability was good (.93), as was inter-rater reliability for the individual schools (.86, .89, .77, respectively). The raters agreed on 87% of the drawings, and were within 1 point of each other on 13%. Steiner children received a mean of 4.05 (SD 0.58), Montessori a mean of 2.2 (SD 0.68), and traditional school children a mean of 3 (SD 0.61). A one-way ANOVA revealed a statistically significant difference among the schools in their use of colour ($F(2,57) = 42.99$, $p < .001$). Tukey’s HSD showed that the Steiner children were rated significantly higher than Montessori or traditional ($ps < 0.01$), and that traditional school children were rated significantly higher than Montessori ($p < .01$). In terms of effect sizes (based on z -scores) the mean rating of the Steiner children was significantly higher than that of the Montessori children ($t(57) = 9.39$, $p < .001$) and of the traditional school children ($t(57) = 5.33$, $p < .001$); the ratings of the traditional school children were significantly higher than those of the Montessori children ($t(57) = 4.06$, $p < .01$).

Free drawing: Number of colours used. The raters agreed on 100% of the drawings. Steiner children used an average of seven colours (SD 1.70), as did Montessori (SD 2.43), while traditional school children used an average of five colours (SD 2.35). A one-way ANOVA showed a statistically significant difference among the schools in the number of colours used ($F(2,57) = 4.80$, $p < .05$). Tukey’s HSD revealed that the children in the traditional school used significantly fewer colours than Steiner or Montessori children ($ps < .05$), but there was no significant difference between Steiner and Montessori. In terms of effect sizes (based on z -scores) the traditional school children used significantly fewer colours than the Steiner children ($t(57) = 2.90$, $p < .01$) and the Montessori children ($t(57) = 2.39$, $p < .05$); there was no significant difference between the Steiner and Montessori children ($t(57) = 0.51$, n.s.).

Scene drawing: Number of colours used. The raters agreed on 100% of the drawings. Steiner school children used an average of eight colours (SD 1.05), Montessori five colours (SD 1.65), and traditional school children seven colours (SD 1.81). A one-way

Figures 1–9. Examples of children's free drawings. (The scores refer to drawing ability, use of colour and number of colours used)

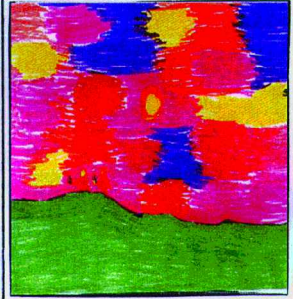
Steiner



1. "Fairies in a cave with crystals".
 Drawn by girl, aged 7;5.
 Scores: 4, 5, 10

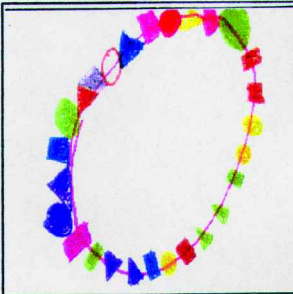


2. "A sailing boat and man".
 Drawn by boy, aged 6;5.
 Scores: 4.5, 4.5, 6

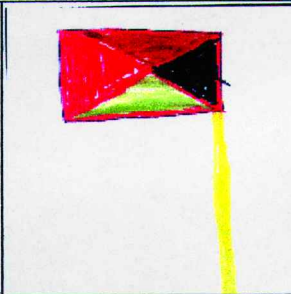


3. "A sunset".
 Drawn by girl, aged 6;7.
 Scores: 5, 5, 6

Montessori



4. "A necklace".
 Drawn by girl, aged 6;4.
 Scores: 2.5, 4, 8



5. "A flag".
 Drawn by boy, aged 7;0.
 Scores: 2, 3, 5

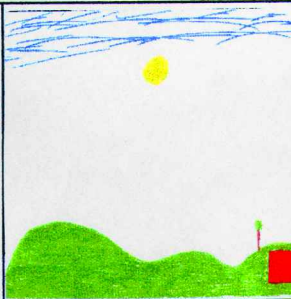


6. "Girl with a balloon".
 Drawn by girl, aged 5;10.
 Scores: 3, 3.5, 8

Traditional



7. "A man on a horse".
 Drawn by boy, aged 6;0.
 Scores: 1, 1, 2



8. "The hills".
 Drawn by girl, aged 7;11.
 Scores: 2, 3, 6



9. "An alien".
 Drawn by boy, aged 7;2.
 Scores: 4, 4, 6

ANOVA indicated a statistically significant difference among the schools in the number of colours used ($F(2,57) = 7.95, p < .001$). Tukey's HSD revealed that Montessori school children used significantly fewer colours in their scene drawings than Steiner or traditional school children ($ps < .01$), but there was no significant difference between Steiner and traditional. In terms of effect sizes (based on z -scores) the Montessori children used significantly fewer colours than the Steiner children ($t(57) = 4.62, p < .001$) and the traditional school children ($t(57) = 3.90, p < .001$); there was no significant difference between the Steiner and the traditional school children ($t(57) = 0.72, n.s.$).

Raters' observations

Free drawing. The two raters were asked when rating the pictures to note anything they thought important or unusual in the drawings. When these notes were collated it was found that both raters commented on the use of the whole page in the drawings which, it transpired, belonged to the Steiner children. Raters also noted that the Steiner children not only used the whole page but also had a tendency to shade in the background as well (Figures 1, 2 and 3), and the majority of Steiner children drew a scene (e.g., man in a boat with sea and sky) rather than just one object, which led to their drawings being perceived as more detailed. In contrast, the Montessori and traditional school children often did not make use of the whole page (Figures 4–9) and had a tendency to draw just one object (e.g., clock, house, flag, flower pot) rather than a scene. It was also noted that when Montessori and traditional school children did draw a scene there was almost always an air gap (Figures 6 and 8), whereas Steiner children almost never left an air gap (Figures 1, 2 and 3).

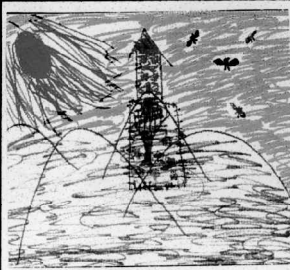
Comments were also made about the shading in the pictures. Steiner children either coloured in an outline they had drawn or did not draw an outline but simply built up the object by shading (Figure 1); in contrast, Montessori and traditional school children always drew the outline of an object first and then coloured it in, although in many cases colouring in did not occur, and the drawings appeared unfinished.

Scene drawing. The raters again commented on the Steiner children's use of the whole page, and general absence of any air gap (Figures 10 and 11). Air gaps were evident in pictures belonging to Montessori and traditional school children (Figures 13–18). Shading was also a feature of Steiner children's scene drawings; the majority coloured in any outlines they had drawn. Montessori drawings showed a lack of shading and retained an unfinished air to them (Figures 13–15), as did the traditional school children's drawings (Figures 17 and 18). The traditional school children's use of colour was seen by both raters as less naturalistic than Steiner or Montessori (Figures 17 and 18), but Steiner pictures were noted to be brighter than those of the Montessori children which had a preponderance of grey, black, brown and green (Figures 13–15).

The raters commented on how the Montessori children's pictures lacked detail and how they often missed out elements of the scene, especially flowers. In contrast, the Steiner and traditional school children often included extra details (e.g., fences around the house or garden, slides, swings, ladders, rainbows, thunder and lightning). Birds in the Montessori pictures were drawn in the classic *m* or *v* shape (Figures 13–15) whereas Steiner and traditional school children drew more realistic birds. The raters also

Figures 10–18. Examples of children's drawings of a scene. (The scores refer to drawing ability, use of colour and number of colours used)

Steiner



10. Drawn by girl, aged 7;6.
Scores: 4, 4, 8

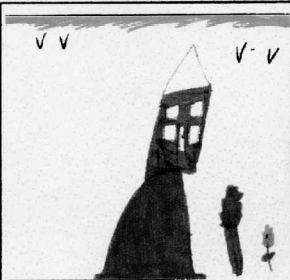


11. Drawn by boy, aged 6;5.
Scores: 3, 4, 8

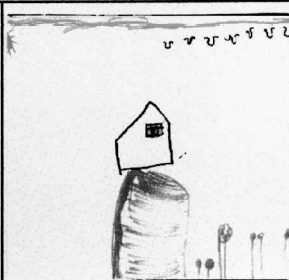


12. Drawn by girl, aged 7;4.
Scores: 4, 4, 6

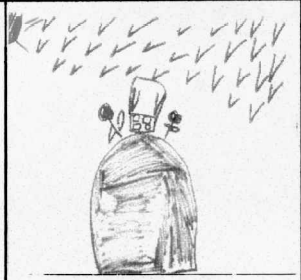
Montessori



13. Drawn by girl, aged 5;11.
Scores: 2, 2.5, 6

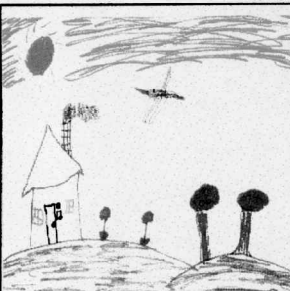


14. Drawn by boy, aged 7;0.
Scores: 1.5, 1, 5

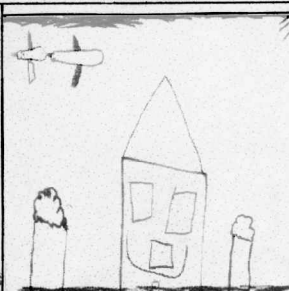


15. Drawn by girl, aged 6;10.
Scores: 1, 1, 4

Traditional



16. Drawn by boy, aged 7;9.
Scores: 3, 3, 9



17. Drawn by girl, aged 6;10.
Scores: 2, 3, 8



18. Drawn by boy, aged 6;0.
Scores: 1, 2, 3

commented on the detailed and realistic trees drawn by the Steiner children (Figures 10–12).

Topics in the free drawing

During data collection each child was asked what s/he was drawing so that a record could be made of the topics children chose to draw. Two researchers independently checked these topics. A significant relationship was found between school type and drawings with fantasy items ($\chi^2(2) = 8.12, p < .05$); Steiner children used fantasy items more and drew scenes more than did Montessori or traditional school children. However, there was no significant relationship between school type and the presence of people in children's free drawings ($\chi^2(2) = 0.58, n.s.$), nor between school type and the presence of inanimate objects/shapes in the drawings ($\chi^2(2) = 3.53, n.s.$).

Observational drawing

The two raters scored all 60 of the observational drawings, using a 12-point scheme devised by Cox *et al.* (1998), and points were awarded depending on whether certain aspects were present in a drawing. This scheme was devised specifically to score drawings of a model figure running towards the right. It includes points for correct orientation of body parts as well as overlap or occlusion of parts as seen from the child's particular viewpoint.

Direction: Point awarded if specified body part pointed to the right: 1) head, 2) arms/torso, 3) legs/feet.

Overlap: Point awarded if the specified body part overlapped another (even though a 'transparency' might have been produced): 4) right arm and torso, 5) leg and leg.

Partial occlusion: Point awarded if the specified body part partially occluded the other without producing a 'transparency': 6) arm and torso, 7) leg and leg.

Proportion: Point awarded if the body parts were reasonably in proportion in comparison with the model: 8) proportion.

Detail: Point awarded if details on the specified body part could be identified on the model: 9) head, 10) clothes, 11) raised right leg




Extra point: 12) awarded if the drawing was recognisable as a person.

The overall inter-rater reliability was good (.97), as was the inter-rater reliability for drawings from each individual school (.88, .99, .97, respectively). The raters agreed on 75% of the drawings, were within 1 point on 20%, and were within 2 points on the remaining 5%. Steiner children received a mean score of 6.8 (SD 1.60), Montessori 5.03 (SD 2.67) and traditional school children 5.38 (SD 2.26). A one-way ANOVA showed a statistically significant difference among the three schools for the observational drawing ($F(2,57) = 3.68, p < .05$). Tukey's HSD indicated that Steiner children received significantly higher scores than Montessori or traditional school children ($ps < .01$), but there was no significant difference between Montessori and traditional school children. In terms of effect sizes (based on *z*-scores) the Steiner children scored significantly higher than the Montessori children ($t(57) = 2.53, p < .05$) and the traditional school children ($t(57) = 2.03, p < .05$); there was no significant difference between the Montessori and the traditional school children ($t(57) = 0.49, n.s.$).


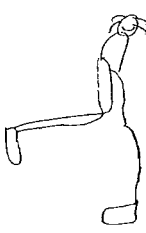
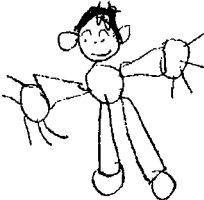
Observations. The raters noted that Steiner children's drawings were more in proportion than the Montessori or traditional school children's. Montessori children

Figures 19–27. Examples of children's observational drawings.



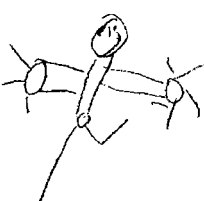
Steiner

 <p>19. Drawn by boy, aged 7;6. Score: 5</p>	 <p>20. Drawn by girl, aged 7;5. Score: 7</p>	 <p>21. Drawn by boy, aged 7;8. Score: 8.5</p>
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Montessori

 <p>22. Drawn by boy, aged 7;5. Score: 9</p>	 <p>23. Drawn by girl, aged 6;4. Score: 3</p>	 <p>24. Drawn by boy, aged 6;0. Score: 3</p>
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Traditional

 <p>25. Drawn by boy, aged 7;11. Score: 10</p>	 <p>26. Drawn by girl, aged 5;11. Score: 3</p>	 <p>27. Drawn by boy, aged 6;0. Score: 2</p>
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often included no sign of clothes whereas Steiner children nearly always did, and traditional school children sometimes did. Both Montessori and traditional school children had a greater tendency to draw the wrong leg raised (Figure 27) and drew more stick men elements and spider hands (Figures 24 and 27) than Steiner children. The majority of Montessori and traditional school children drew their model man in segments not as a continuous outline (Figures 23, 24 and 27) while Steiner children tended not to draw in segments but in continuous outlines which were then shaded in. A noticeable feature of some Steiner children was that they did not, in fact, draw any outlines to represent the model man; instead, they shaded the shape of the figure (Figures 19–21).

It was also observed that there was no occlusion (with or without ‘transparency’) of the model’s legs in any of the drawings. Traditional school children attempted occlusion of the arm and torso, and some succeeded without ‘transparency’ (Figure 25). Montessori school children attempted occlusion far less, and if it did occur it was in the form of a ‘transparency’ (Figure 22). Steiner children made more successful attempts at occlusion, although the majority showed transparency elements.

Discussion

The results indicate that in general terms the Steiner approach elicits significant differences in children’s art work, while the Montessori produces children with similar artistic skills to traditional school children. The first prediction was supported: Steiner children produced drawings rated as more proficient (in terms of the ratings of their free and scene drawings) than Montessori or traditional school children. This is perhaps not surprising due to the greater emphasis on art in the Steiner curriculum as compared with Montessori and traditional schools; the teachers in the Steiner schools also receive more artistic training. Teaching children pictorially and creating experiences for them to develop their artistic abilities, it would seem, equips them with superior drawing skills. It is interesting that the Steiner children’s drawings for this study were rated so highly when they do not normally use felt tip pens in school; it is likely, nonetheless, that they have experienced these at home or at their friends’ houses. The Montessori children performed similarly to the traditional school children on the free drawing, although less well on the scene drawing. It appears that today’s Montessori schools allow for increased provision of art in the curriculum compared with the original approach (e.g., Merz, 1996; Schneider, 1996).

The second prediction was supported in so far as the Steiner children were rated more highly in their use of colour in both their free and scene drawings. The expressive use of colour is a particular feature of the Steiner approach to art. These children’s drawings did not stand out, however, in terms of the number of colours used: both Steiner and Montessori children used more colours than the traditional school children in the free drawing, and both Steiner and the traditional school children used more in the scene drawing than did the Montessori children.

Prediction three was that the Steiner children would draw more fantasy elements in their free drawings compared with the Montessori and traditional school children. This was supported. Fantasy is a large part of the Steiner curriculum: children are told fairy tales involving princes, princesses, fairies, kings, queens and barons almost every day,

and their free drawings reflected this. In most Steiner classrooms there are no conventional toys or equipment (Edmunds, 1975) because Steiner (1909) believed that children's imagination was under attack 'as our materialistic age produces few good toys' (p.26). In order to encourage fantasy play and imaginative development children in Steiner schools are encouraged to make their own toys or to use natural or everyday objects and imagine the rest. This imaginative fantasy theme presented itself in many of the Steiner children's drawings. The original Montessori approach lies at the opposite end of the scale in relation to fantasy, while traditional schools reside somewhere in between; however, both Montessori and traditional school children in this study rarely presented pictures with fantasy themes. Of course, this does not mean that these children cannot draw fantasy themes, simply that they did not choose to do so in a free drawing task.

Unlike the finding of Dreyer and Rigler (1969), the Montessori children in this study were no more likely than the other two groups to draw inanimate objects or shapes or to exclude people from their free drawings. The reason for this may be that today's Montessori schools in the UK are different from those of earlier times, but it may also be that Dreyer and Rigler's study was carried out in the United States and the results do not generalise across time and continents.

There were differences among the three groups of children in the organisation of the free and scene drawings. For example, Steiner children almost always omitted an 'air gap' while the other two groups of children nearly always presented pictures with an air gap between the sky and the ground. The closing of the air gap normally occurs at age 11 or 12 (Lewis, 1990), yet the mean age of the Steiner children in this study was 7;2. All the pictures on the wall in the Steiner school were scenes with no air gaps. Thus, it may be that the children are specially taught to fill in the whole page (although there is apparently no formal teaching of art in Steiner schools) or that they absorb the style of the pictures they see around them. Another explanation may be the effect of the block crayons that Steiner children usually use, which can fill in a background in a matter of seconds. The children may have continued to use this technique even when presented with implements less conducive to this task, namely felt tip pens. Whatever the reason, it is clear that Steiner children are advanced drawers in this respect compared with others of a similar age.

Steiner children were more proficient at shading and shaded in outlines they had drawn, while Montessori and traditional school children often did not. This may be attributed to the importance of colour in Steiner schools: bare outlines it could be argued show nothing, whereas outlines filled with colour can represent qualities (warm and cold) and concepts (good and evil), and accurately depict a scene. Another outstanding feature was that Steiner children often shaded pictures without using outlines; it is possible that they copied this technique from other pupils. Other notable differences included the realistic trees and birds drawn by Steiner children, and the *m* or *v* shaped birds drawn by Montessori children. This is surprising considering the emphasis that Montessori schools place upon reality, and the statement that Montessori (1918) made regarding the fact that even young children apparently choose to draw realistic outlines of the objects that they see.

There was limited use of occlusion or perspective in all the pictures, but considering the age of all the children involved this is not unusual. According to Luquet (1913,

1927) young children are concerned to show everything that is there and, in doing so, draw objects separately and with no overlap or occlusion. It is not normally until about the age of 8 years that children successfully depict the partial occlusion of one object placed behind another (Cox, 1978, 1981; Freeman, Eiser, & Sayers, 1977). Individual objects are depicted in terms of the actual shape rather than their projected shape. Thus, when children begin to draw single objects such as a table or a house in depth they use parallel oblique lines around the age of 9–10 years and converging perspective lines only in the adolescent years (Freeman, 1980; Willats, 1977). Luquet (1913, 1927) referred to these different modes of pictorial representation as intellectual and visual realism. Piaget and Inhelder (1956) claimed that young children's egocentrism hinders their ability to draw in a visually realistic way because they cannot adopt a particular point of view.

The observational drawing yielded interesting results. The fourth prediction was that the children in the traditional and Montessori schools would gain higher scores than the Steiner children. The teacher in the Steiner school was concerned that the children would find the observational task hard and perform poorly as there is no practice in observational drawing in Steiner schools, and no teaching of the skill. Furthermore, Steiner children at this age are not used to using standard pencils at school, although they undoubtedly will have used them elsewhere. In fact, the Steiner children's observational drawings were judged to be superior and not inferior to those of the other children.

Their mean score was similar to that of the 8-year-olds in a previous study which used the same observational task (Cox *et al.*, 1998). The Steiner children appeared to spend more time looking back at the model, ensuring their picture was as accurate as possible, and drawing continuous outlines and not segments (as Montessori and traditional school children did). As in the free and scene drawings, some children simply shaded the model man and did not draw any outlines. Montessori and traditional school children appeared not to concentrate on the model to be drawn, and instead incorporated at least some of their usual schema for a person (stick man elements and spider hands). There was a general lack of occlusion in all the drawings, but this can be explained by the children's young age. It is not clear why the Steiner children should have produced such well-observed drawings. It may be that their normal attention to detail in illustrating and decorating their school work generalised to this task. In addition, it may be that the novelty of this drawing task interested them and encouraged them to attend to the instructions more carefully than did the children in the other schools.

This study has provided interesting results regarding the three different approaches to art education. It would appear that if children are provided with an environment rich in creativity (as in the Steiner schools) they develop more artistic skills. The teacher in the Steiner school in this study claimed that art departments in mainstream secondary schools welcome Steiner children (who often join them at 14 years of age) because of their interest and ability in art. Steiner teachers receive more artistic training than do most teachers in PGCE courses and, as a consequence, are perhaps more skilful in art teaching than their counterparts in other primary schools. However, since Steiner teachers claim not to give direct tuition in drawing it could be that it is their very positive attitude towards art which is more important. Art is not considered as a separate nor as a 'filler' activity as it so often is in many traditional schools (Hargreaves

& Galton, 1992); rather, it is seen as integral to most aspects of the curriculum. In turn, it is likely that children imbibe the attitude that art is an important activity, worthwhile spending time on, and that a high standard is expected and valued.

While traditional schools and today's Montessori schools may seek to promote a creative environment they may still not accord art the very high status that it clearly has in the Steiner schools. Despite the national curriculum for art (Department of Education, 1995) teachers may be more concerned with school subjects, particularly literacy and numeracy, which are more formally assessed, and give less priority to art, regarding it perhaps as 'icing on the cake'. However, art could be accorded more emphasis in schools and it is not necessarily the case that already over-worked teachers would have to create more time for it; we speculate that the crucial factor may be teachers' attitude rather than the allocation of more time. Teachers already teach designated art lessons and they incorporate art into other subjects by, for example, encouraging children to embellish their work with drawings. This encouragement might have added impetus if teachers believed that art can serve as more than embellishment. As Eisner (1992) has pointed out, the school curriculum should be aimed at the development of multiple forms of literacy, including words, numbers, sounds and visual images. Some concepts may be better understood through visual means and some children may be predisposed to learning through visual media. These are important educational reasons for taking a serious view of the role of art in the curriculum.

Although the Steiner children in this study appear to have shone with artistic ability, caution is needed in jumping to the conclusion that this is the direct and sole result of the Steiner approach to art education. Although this may be the case we must also consider the possibility that the educational approach of Steiner schools may attract more creatively-minded parents who produce and nourish artistic creativity in their own children. Influences from home and school may combine to promote the artistic skills of these children.

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