

Elizabeth Carruthers & Maulfry Worthington (2006) *Children's Mathematics: Making Marks, Making Meaning*. (2nd Edition) London: Paul Chapman Publishing.

Foreword

John Matthews

This is one of the most important books on emergent mathematical thought in infancy and early childhood ever written.

Those of us who have devoted our lifetimes attempting to understand the origin and development of expressive, representational and symbolic thought in infancy and childhood, and how best to support it, quickly came to realise that the beginnings of linguistic and mathematical thought are embedded in rather commonplace actions and drawings made by the infant and young child.

Developmentally, these beginnings are of the most profound importance. They form the child's introduction to semiotic systems without which her life in the symbol-rich society of humans will be dangerous if not impossible.

Tragically, these crucial beginnings of expressive, representational and symbolic thought are often discounted completely and receive little or no support from the pedagogical environment.

Why is this? It is because, if these actions are glanced at cursorily, they appear trivial, meaningless and sometimes even as a threat to social control. Children's emergent semiotic understandings are often expressed in free-flowing, dance-like and musical actions, in vocalisation and in children's early drawings. This latter mode of representation is of especial power for the child because it is within the action of drawing (and please, please note that I am writing here of the child's *spontaneous*, self-initiated, self-guided drawing) that the child comes face-to-face with the awesome power of symbolic representation, that marks on a flat surface (whether these be physical pigment on a piece of paper, traces of light on a screen, or images on a liquid crystal display of a digital camera) are just that, yet simultaneously they refer to objects, events, ideas and relationships beyond the drawing surface.

Tragically, these profound beginnings of symbolic thought are still, in the main, discounted as "scribbling." Misguided attempts to "improve" children's drawing and "observational" skills, sometimes enlisting the support of so-called "art specialists", make matters worse, cutting across, as they do, a crucial sequence of semantic and organisational principles spontaneously emerging on the drawing surface.

Sometimes my students ask me to recommend a good book on children's "art". I tell them to read the one you have started to read now, Carruthers's and Worthington's "Children's Mathematics." The concept of "children's art", with its inevitable train of consequences of "art lessons" and "art-specialists" in the early years, is at best, a mixed blessing. Definitional problems about the nature of visual representation have obscured the real meaning and significance of children's 2 dimensional visual structure (along with their interrelated investigations into 3 & 4D structures – the fourth dimension being the dimension of time). Many of the curriculum initiatives which bring dance, music and art "expertise" into nursery are about as appropriate to children's development, and about as interesting to children, as mortgage agreements. Such initiatives merely add to the damage wrought upon children's emergent symbolisation.

Children's earliest drawing is generated spontaneously and is interrelated with many of their other modes of expression and representation. Although self-initiated and driven along by the child, it requires adult companions who are able to identify the operant modes of representation employed by the child. Such adults are therefore in a better position to supply intellectual and emotional support for the development of semiotic thought. Carruthers and Worthington not only identify the mathematical aspects of children's early modes of expression and representation, including drawing, they also show the teacher how these modes of representation may be best supported.

A careful reading of this fascinating book is quite simply the best way of understanding the growth of mathematical thought in infancy and how adult companions might nourish and support its development.

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