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The Art of Children's Mathematics

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Abstract:

In this paper we explore the relationship between children's early drawing and their 'mathematical graphics': we coined this term to describe the range of marks children make through visual representation when exploring their mathematical thinking.

Since 1990 we have explored more open ways of working with children as they represent mathematics, in ways that are similar to effective pedagogy in early art and writing. Our research is an evidence-based, ethnographic study with data collected over 12 years. We analysed 700 examples of children's own mathematical graphics from 3 – 8 in homes, nursery classes and schools and developed a taxonomy tracing development from their earliest marks, drawings and symbols. This is the first time that this has been done (Worthington & Carruthers, 2003). Indeed, whilst there is abundant research on early art (e.g., Anning & Ring, 2004; Matthews, 1999; Golomb, 2002; Malchiodi, 1998) and early writing (e.g., Clay, 1975; Bissex, 1980), there has been a dearth of research into the development of children's visual representations in mathematics.

Our research shows how these representations are inventive, creative and joyous, reminding us of the amazing creativity of young children if only teachers have confidence and understanding to support it. They allow children to explore their thinking in ways that mirror the thinking of artists and mathematicians. Viewing children's representations from a positive perspective provides opportunities for children to explore and make decisions about their own chosen forms and has the power to support deep levels of cognitive demand and high levels of creativity.

Key words: visual representation, mathematical graphics, creativity;