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The scheme of correspondence and its role in understanding relations

Numbers are used in primary school to represent quantities and relations. Most of the research about children's learning and of the teaching efforts focus on children's use of number to represent quantities. This paper analyses the role that the scheme of correspondence plays in children's understanding of relations between quantities. One-to-one correspondence is a sine qua non for counting but also for understanding equivalences between sets even in the absence of counting. One-to-many correspondence provides a natural and effective foundation for children's understanding of multiplication, division, and fractions, and also provides a foundation for children's understanding of multiplicative relations. Children and adults who use of mathematics outside school rely on the scheme of one-to-many correspondences to solve proportions problems; this finding supports the idea that this scheme is a natural foundation for understanding relations. New longitudinal and intervention studies will be reported, which show that children's knowledge of how to use one-to-many correspondences plays a critical role in their mathematics development.

Implications for teaching will be discussed and a programme that helps students become aware of relations that they understand only implicitly will be presented.