Developmental psychologists agree that intelligent action precedes language in children’s development and that language transforms children’s thinking. In this lecture I will explore the ways in which children’s thinking in action is transformed by learning to use conventional mathematical signs to represent quantities and relations between quantities. Numbers have two types of meaning: a referential meaning, which connects numbers to quantities, and an analytical meaning, which is intrinsic to the conventional systems of signs. This dual nature of numbers means that, from the psychological perspective, numbers are models of the world. The referential meaning of numbers is based on children’s use of schemas of action to establish relations between quantities; it is at the core of quantitative reasoning. The analytical meaning rests of the rules that define relations between numbers in a conventional system and provides the basis for arithmetic. In this talk I will present research that illustrates how teaching can build a bridge between thinking in action and mathematical models by promoting the coordination of quantitative reasoning with number knowledge.