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**Title:** Foundations of Mathematical Cognition

**Abstract:** Humans come into the world with an intuitive understanding of number that allows rough estimations and operations of large numerical quantities without language. At the same time, we learn numerical symbols that enable precise representation of numerical quantity, which in turn give rise to full-fledged mathematical thinking. What is the nature of the human mind and brain that provides this *a priori* number sense? How does developmental experience with symbolic number knowledge build on this existing intuition and shape the mind and brain? In this talk, I will describe a number of behavioral, neuroimaging, and developmental studies that elucidate how our primitive and symbolic understanding of number forms the foundations of mathematical thinking. Findings from these research projects provide both theoretical advances in our understanding of the nature of human knowledge and practical advances in improving math, an important academic skillset, for the next generations.