PARTICIPANT BIOGRAPHIES

Martha W. Alibali

Martha W. Alibali is a cognitive and developmental psychologist who studies children's knowledge and communication about mathematical concepts. She earned her Ph.D. in Psychology at the University of Chicago, and she is currently Professor of Psychology and Educational Psychology at the University of Wisconsin - Madison. Her research focuses on mechanisms of knowledge change in cognitive development and learning. In particular, she investigates the change processes that take place when children learn new concepts and problem-solving strategies, and when they express and communicate their knowledge in gestures and in speech. Her current research projects examine the transition from arithmetic to algebraic reasoning and the nature of mathematical reasoning in children with language impairments.

John Anderson

John Anderson is the Richard King Mellon Professor of Psychology and Computer Science at Carnegie Mellon University. His research is on the ACT-R cognitive architecture and learning more generally. Much of this research has focused on mathematical learning, intelligent tutoring systems, and fMRI brain imaging. He obtained his BA from the University of British Columbia in 1968 and PhD from Stanford in 1972. He has received American Psychological Association's Distinguished Scientific Career Award in 1994; in 1999 he was elected to the National Academy of Sciences and the American Academy of Arts and Sciences, and in 2003 he won David E. Rumelhart Prize for Contributions to the Formal Analysis of Human Cognition.

Hyman Bass

Hyman Bass is the Roger Lyndon Collegiate Professor of Mathematics and Professor of Mathematics Education at the University of Michigan. Prior to 1999 he was Adrain Professor of Mathematics at Columbia University. His mathematical research publications cover broad areas of algebra, with connections to geometry, topology and number theory. He has received the Cole Prize in Algebra from the American Mathematical Society, and the Van Amringe Book Award from Columbia University for a book that helped found the subject of algebraic K-theory. Bass has been president of the American Mathematical Society, and chair of the Mathematical Sciences Education Board at the NAS, and of the Committee on Education of the American Mathematical Society; he is currently President of the International Commission on Mathematics Instruction. During the past eight years he has been collaborating with Deborah Ball and her research groups at the University of Michigan on the mathematical knowledge and resources entailed in the teaching of mathematics at the elementary level.

Daniel B. Berch

Daniel B. Berch currently directs the Program in Mathematics and Science Cognition and Learning at the National Institute of Child Health and Human Development, NIH. He came to the Washington, DC area in 1997 to serve as an SRCD/AAAS Executive Branch Science Policy Fellow. He was subsequently appointed Senior Research Associate at the U. S. Department of Education, advising the Assistant Secretary for Educational Research and Improvement on technical and policy matters pertaining to educational research. In his prior academic career, Dr. Berch was Director of Research for the Department of Psychology at the University of Cincinnati, where he also chaired the University's Institutional Review Board and served as Research Coordinator for the University Affiliated Cincinnati Center for Developmental Disorders. He has published articles and book chapters on children's numerical cognition, mathematical learning disabilities, spatial information processing, and short-term memory.

David Carraher

David Carraher, Senior Scientist at TERC, Cambridge, MA, is Principal Investigator of The *Early Algebra, Early Arithmetic Project* and Research Director of the Fulcrum Institute for Education in Science, two NSF-funded projects. His research focuses on how learners grapple with foundational ideas of mathematics and science matters that may have been effectively resolved within the disciplines but nonetheless present challenges to today's students and teachers. In the Early Algebra Project he has been working with colleagues to explore how algebra can be integrated into the existing curriculum in ways that make sense in terms of Mathematics itself as well as what we know about how young children learn about and reason with mathematics.

Diana I. Cordova

Diana Cordova joined the Institute of Education Sciences, United States Department of Education, in October 2003. She is the Acting Associate Commissioner of the Teaching and Learning Division of the National Center for Education Research (NCER). Prior to joining the Institute of Education Sciences, she was a faculty member in the department of Psychology at Yale University from 1994-2000 and served as Assistant Dean of the Yale Graduate School of Arts and Sciences from 2000-2003. In 1999, she was awarded the Lex Hixon Prize for Teaching Excellence in the Social Sciences. She has published extensively in the area of student motivation and academic achievement. In particular, she has conducted experimental research on the effects of intrinsic versus extrinsic rewards on the process of learning. Diana Cordova received her Ph.D. in Social Psychology from Stanford University in 1993.

David C. Geary

David C. Geary received his Ph.D. in developmental psychology in 1986 from the University of California at Riverside and from there held faculty positions at the University of Texas at El Paso and the University of Missouri. Dr. Geary served as chair of the Department of Psychological Sciences from 2002 to 2005, as the University of Missouri's Middlebush Professor of Psychological Sciences from 2000 to 2003, and is now a Curators' Professor. He has published more than 125 articles and chapters across a wide range of topics, including cognitive and developmental psychology, education, evolutionary biology, and medicine. His three books are *Children's mathematical development* (1994), *Male, female: The evolution of human sex differences* (1998), and *The origin of mind: Evolution of brain, cognition, and general intelligence* (2005). In addition to these activities, he was one of the primary contributors to the *Mathematics Framework for California Public Schools: Kindergarten through grade twelve*. Among many distinctions is the *Chancellor's Award for Outstanding Research and Creative Activity in the Social and Behavioral Sciences* (1996), and a MERIT award from the National Institutes of Health.

Roger Howe

Roger Howe received his Ph.D. from the University of California at Berkeley in 1969, and has been in the Mathematics Department at Yale University since 1974. His mathematical research is mostly concerned with applications of symmetry. In 1996-97, he served as a Phi Beta Kappa Visiting Scholar. He has served on many committees and panels devoted to mathematics education, including the Mathematical Sciences Education Board, the Board of Directors of the Connecticut Academy for Education in Mathematics, Science and Technology, the NRC Mathematics Education Study Panel, the RAND Panel on Mathematics Education Research, the Steering Committee of the CBMS Mathematical Education of Teachers report, and the Mathematics Portfolio Review Committee for the Education and Human Resources Division of the NSF. He was Chair of the AMS Review Group for revision of the NCTM Standards, and also has been Chair of the AMS Committee on Education. Currently he is visiting SUNY Stony Brook to investigate the feasibility of a project to improve the understanding of mathematics curriculum.

Kenneth R. Koedinger

Kenneth R. Koedinger is a Professor of Human-Computer Interaction and Psychology at Carnegie Mellon University. He has a BS in Mathematics, a MS in Computer Science (University of Wisconsin, 1984, 1986), a PhD in Psychology (CMU, 1990), and has spent time teaching geometry in an urban high school. This multi-disciplinary background has been critical to his research goal of creating educational technologies that demonstrably and dramatically increase student achievement. Toward this goal, he has developed computer simulations of student thinking that are used to guide the construction of educational materials and are the core of intelligent software systems that provide students with individualized interactive learning assistance. He has developed such "Cognitive Tutors" for mathematics and has tested them in the laboratory and the classroom.

Tom Loveless

Tom Loveless is Director of the Brown Center on Education Policy and Senior Fellow in Governance Studies at the Brookings Institution in Washington, D.C. Loveless's research focuses on K-12 education policy and the politics of educational reform. He is author of *The Tracking Wars: State Reform Meets School Policy* (1999)*,* co-editor of *Stability and Change in American Education* (2003) and *Bridging the Achievement Gap* (2002) , and editor of *The Great Curriculum Debate: How Should We Teach Reading and Math?* (2001) and *Conflicting Missions?: Teachers Unions and Educational Reform* (2000)*.* Loveless also authors *The Brown Center Report on American Education,* an annual publication featuring three studies. Loveless has contributed chapters to several volumes and published numerous journal articles, reviews, and opinion pieces. Loveless's teaching experience includes nine years as a sixth grade teacher in California and seven years as Assistant and Associate Professors of Public Policy at the John F. Kennedy School of Government, Harvard University. Loveless received his Ph.D. in education from The University of Chicago in 1992.

R. James Milgram

Jim Milgram is a professor of mathematics at Stanford University. His area of research is in geometric topology, and his recent work has been in areas related to robotics and the geometry of protein folding. He has also been involved in mathematics education for the past 8 years. He is one of the authors of the *California Mathematics Standards*, the *California Mathematics Framework*, and has worked with a number of other states as well as Achieve on their standards. More recently, he has worked with the Secretary's office at the Department of Education on issues relating to the mathematics that pre-service K - 8 teachers need to know and how they should understand it. The book *The Mathematics Pre-Service Teachers Need to Know* that resulted is freely available at http://math.stanford.edu/ftp/milgram/FIE-book.pdf. Professor Milgram is currently a member of the National Board for Education Science that oversees the Institute for Education Science at the Department of Education, and the Blue Ribbon Task Force for the Administration's Math/Science Initiative.

Joan Moss

Joan Moss is an assistant professor in the Department of Human Development and Applied Psychology at the Ontario Institute for Studies in Education, University of Toronto. Her research has focused on young children's mathematics learning and the design of developmentally based curricula. Her work on rational number learning has been published in research journals and in volumes for teachers, including the National Academy series *How Children Learn: History Science and Mathematics in the Classroom.* The rational number curriculum that she developed for fourth and fifth grade students has been included in the mathematics text series *Real Math*. More recently, she has been engaged in classroom-based studies on children's development of early algebraic reasoning, taking place at both the Laboratory school at the University of Toronto and the new Laboratory school at Columbia University. Joan is a former elementary school mentor teacher.

Gregg Solomon

Gregg Solomon received his Ph.D. in Psychology at Harvard University, where he later taught. He is currently Program Director for the Research on Learning and Education (ROLE) program and for the Science of Learning Center (SLC) program at the National Science Foundation. His research with children explores their understandings of folk biology and race and their understandings of rational numbers. His research with adults investigates the nature and acquisition of expertise. Most recently, he has been involved in a series of collaborations with cultural anthropologists, focusing on questions of universality and relativity in cognition, as well as on meta-questions concerning the nature of evidence in scientific argument. He is also active in developing ties between the cognitive science, physical science, and education research communities.