Editorial

The Creative Mind: Myths and Mechanisms: six reviews and a response

Mark Stefik and Stephen Smoliar, editors

Creativity is a topic of recurring public interest. What distinguishes the great geniuses of art, music, and science? Every year the MacArthur Foundation awards a few individuals with "genius grants", about $300,000 to spend with no strings attached. Some of the recipients describe themselves not so much as geniuses, but as people who work with creativity, perhaps seeing things in new ways. Describing the rationale for its "genius awards", a spokesperson for the foundation recently said that they award creativity, because creativity is at the heart for how people can improve the human condition.

Is one culture inherently more creative than another? Does our educational system enhance or suppress creativity? Is creativity one of the hallmarks of genius, or of human intelligence? Is creativity something that animals and machines cannot do? These questions provide an inkling of how the topic of creativity permeates the social matrix.

Boden is a Fellow of the British Academy and Professor of Philosophy and Psychology in the School of Cognitive Sciences at the University of Sussex, England. She has written popular and influential books introducing artificial intelligence and relating it to philosophy. In *The Creative Mind*, she ties creativity into the research of artificial intelligence. She asks whether the mechanisms of mind studied in AI and cognitive science shed light on the nature of creativity. The AI connection brought the thesis of this book to our attention.

Creativity has often been studied, but not so much by people in AI. In brief, Boden starts with symbolic problem solving models. Problem solving is search. Creative problem solving involves finding important solutions that other searchers miss. This extra search power comes from an ability to transform the search space. So does this account stand up to scrutiny? To answer this question, we have drawn on a set of reviewers with diverse backgrounds, people from fields where creativity is recognized and people who have studied creativity.

Ken Haase is an assistant professor of Media Arts and Sciences at MIT where his research interests include knowledge representation, natural language processing, and automatic media description and generation. His doctoral research was in the area of machine discovery and creativity.

Roger Lustig studied statistics at Princeton University and musicology at the University of Chicago. His research interests include Handel, Mozart, and Schoenberg; he has translated Carl Dahlhaus' *The Idea of Absolute Music.*

David Perkins is senior research associate at the Harvard Graduate School of Education and co-director of Harvard Project Zero, where he investigates critical and creative thinking, understanding, and implications for education. His several books include *The Mind's Best Work* on creativity and the just released *Outsmarting IQ: The Emerging Science of Learnable Intelligence.*

Janet Kolodner is a professor in the College of Computing at the Georgia Institute of Technology and director of the EduTech Institute. Her research interests are in case-based reasoning, computational models of cognition, and the implications of cognition for learning and design of educational technology. Ashwin Ram is an associate professor in Georgia Tech's College of Computing, working on introspective multi-strategy learning, taking a case-based approach. Eric Domeshek is an assistant professor of Electrical Engineering and Computer Science at Northwestern University, and a member of the University's Institute for the Learning Sciences. His research interests include representation for multimedia indexing and retrieval, design cognition and environments, and human–computer systems. Linda Wills is a research scientist at Georgia Tech. Her interests are in creative design and software syntheses. Nancy Nersessian is professor of cognitive science at Georgia Tech, working on scientific conceptual change.

Roger C. Schank is John Evans Professor of Electrical Engineering and Computer Science, Professor of Education and Social Policy, and Professor of Psychology at Northwestern University. He is the founder and director of the Institute for the Learning Sciences. He is best known for his work on natural language processing, story understanding, models of learning and memory, and case-based reasoning. His current research interests are in the area of developing innovative computer-based learning environments based on cognitive theories of learning, memory, and reasoning. His recent books include *Tell Me a Story*, *The Connoisseur's Guide to the Mind*, and *Engines for Education.* David A. Foster is completing his doctoral research in Computer Science at the Institute for the Learning Sciences at Northwestern University. His research centers on the development of intelligent learning-by-doing environments for business education.

Scott Turner is a senior member of the technical staff at Aerospace Corporation. His research interests include computational creativity, expert systems, and emerging technologies. His thesis research was published as a book, *The Creative Process: A Computer Model of Storytelling and Creativity*, in 1994.

This set of reviews and response took a long time to complete. Between the time that we started it and its publication several other books on computers and creativity have appeared. Some of these are listed in the references. Stephen Smoliar reviews one of them [4] in this issue.

Stephen W. Smoliar is a senior research scientist at the Institute of Systems Science in the National University of Singapore. His current research interests are

in computer-based multimedia systems and how they can enhance creativity. Together with Borko Furht and HongJiang Zhang, he recently published the book *Video and Image Processing in Multimedia Systems*.

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