The UCSB brown-bag forum on spatial thinking

Presents

David Uttal
Professor of Psychology and Education at Northwestern University

Spatial Abilities and STEM Education: When, Why, and How

Psychology 1523
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Abstract. Are spatial skills important for Science, Technology, Engineering and Mathematics (STEM) education and practice? The answer seems to be both yes and no. On the one hand, some research (e.g., Wai, Lubinski, & Benbow) has revealed strong and consistent correlations between spatial abilities and STEM career choice. However, several studies (e.g., Hambrick et al., in press; Stieff, 2007) have shown that spatial skills do not seem to predict performance in experts. I will begin my talking by trying to resolve this seeming paradox, suggesting that spatial skills serve more as a barrier or gateway to STEM entry than as a critical part of STEM practice. This argument then lays the foundation for a case for when spatial training and experiences might facilitate STEM achievement. I will review the work on spatial training and argue that it could help many students to get over the barriers to early STEM learning. I will also argue that spatial training is effective, that it transfers, and that it can endure. Taken together, the findings I discuss help to constrain the possible answers to the questions regarding when, why, and how spatial thinking matters in STEM education and also suggest what we can and cannot expect to happen if we attempt to improve students' spatial thinking.

David Uttal is Professor of Psychology and Education at Northwestern University. He serves as Director of the Multidisciplinary Program in Education Sciences, and IES-funded pre-doctoral training program that focuses on interdisciplinary and mixed methods approaches to education research. He also serves as Director of the Cognitive Division in the Psychology Department. He is a Fellow of the American Psychological Association and the American Psychological Society. His work has been funded by the National Institutes of Health, the National Science Foundation, and the Institute for Education Sciences. His research interests are in spatial and mathematical thinking and their development.

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The objectives of the ThinkSpatial brown-bag presentations are to exchange ideas about spatial perspectives in research and teaching, to broaden communication and cooperation across disciplines among faculty and graduate students, and to encourage the sharing of tools and concepts. Please contact Don Janelle (ext 5267, janelle@spatial.ucsb.edu) to review and schedule possible discussion topics or presentations that share your disciplinary interest in spatial thinking.