

SILC Showcase
Spatial Training:
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Have you ever struggled to put together furniture that you ordered with “some assembly required”? Have you ever watched in awe as the instructor of introductory organic chemistry talked with bewildering rapidity and some mysterious board markings about molecules fit together? Visualization is an essential component of both everyday life and the development of scientific expertise. It has often been considered relatively fixed, or at best a skill that can be painfully acquired in specific areas, but without generalization to similar domains. However, two recent studies have just appeared that show that large, durable and generalizable improvements in visualization skill are possible.

In one study, Terlecki, Newcombe & Little (2008) asked undergraduates to participate in semester-long weekly practice with the Mental Rotations Test (MRT), a widely-used assessment of visualization. Additionally, some of them played the videogame Tetris. Both groups showed large improvements in mental rotation and these gains were maintained several months later. Videogame training transferred to two other spatial tasks at levels exceeding the effects of practice, and this transfer advantage was still evident after several months. In another study, Wright, Thompson, Ganis, Newcombe & Kosslyn (2008) tested undergraduates on two spatial tasks: mental rotation task and mental paper-folding. Each individual then participated in daily practice sessions with either mental rotation or mental paper folding over 21 days. Participants showed practice gains to novel stimuli for the practiced task, as well as transfer to the other, non-practiced, spatial task. Thus, practice effects were process-based, not instance-based.

Further work is underway to identify the processes that change, and to isolate the training conditions that are necessary to achieve such effects. For now, however, these studies show that there is reason to be optimistic that people can learn better spatial skills, both for assembling furniture and for learning science.

Terlecki, M.S. & Newcombe, N.S. (2008). Durable and generalized effects of spatial experience on mental rotation: Gender differences in growth patterns. *Applied Cognitive Psychology*, 22, 996-1013.

Wright, R., Thompson, W.L., Ganis, G., Newcombe, N.S. & Kosslyn, S.M. (2008). Training generalized spatial skills. *Psychonomic Bulletin and Review*, 15, 763-771.

Example of Mental Paper Folding:

