

THREE-YEAR STUDY AT SEVEN MAJOR UNIVERSITIES FINDS STRONG LINKS BETWEEN ARTS EDUCATION AND COGNITIVE DEVELOPMENT

Washington, DC, March 4, 2008— *Learning, Arts, and the Brain*, a study three years in the making, is the result of research by cognitive neuroscientists from seven leading universities across the United States. In the Dana Consortium study, released today at a news conference at the Dana Foundation's Washington, DC headquarters, researchers grappled with a fundamental question: Are smart people drawn to the arts or does arts training make people smarter?

For the first time, coordinated, multi-university scientific research brings us closer to answering that question. *Learning, Arts, and the Brain* advances our understanding of the effects of music, dance, and drama education on other types of learning. Children motivated in the arts develop attention skills and strategies for memory retrieval that also apply to other subject areas.

The research was led by Dr. Michael S. Gazzaniga of the University of California at Santa Barbara. "A life-affirming dimension is opening up in neuroscience," said Dr. Gazzaniga, "to discover how the performance and appreciation of the arts enlarge cognitive capacities will be a long step forward in learning how better to learn and more enjoyably and productively to live." The consortium's new findings and conceptual advances have clarified what now needs to be done.

Participating researchers, using brain imaging studies and behavioral assessment, identified eight key points relevant to the interests of parents, students, educators, neuroscientists, and policy makers.

1. An interest in a performing art leads to a high state of motivation that produces the sustained attention necessary to improve performance and the training of attention that leads to improvement in other domains of cognition.
2. Genetic studies have begun to yield candidate genes that may help explain individual differences in interest in the arts.
3. Specific links exist between high levels of music training and the ability to manipulate information in both working and long-term memory; these links extend beyond the domain of music training.
4. In children, there appear to be specific links between the practice of music and skills in geometrical representation, though not in other forms of numerical representation.
5. Correlations exist between music training and both reading acquisition and sequence learning. One of the central predictors of early literacy, phonological awareness, is correlated with both music training and the development of a specific brain pathway.
6. Training in acting appears to lead to memory improvement through the learning of general skills for manipulating semantic information.
7. Adult self-reported interest in aesthetics is related to a temperamental factor of openness, which in turn is influenced by dopamine-related genes.
8. Learning to dance by effective observation is closely related to learning by physical practice, both in the level of achievement and also the neural substrates that support the organization of complex actions. Effective observational learning may transfer to other cognitive skills.

As several of the consortium members stressed at today's news conference, much of their research was of a preliminary nature, yielding several tight correlations but not definitive causal relationships.

Although “there is still a lot of work to be done,” says Dr. Gazzaniga, the consortium’s research so far has clarified the way forward. “We now have further reasons to believe that training in the arts has positive benefits for more general cognitive mechanisms.”

Principal investigators, working with their colleagues, were:

1 How Arts Training Influences Cognition

Michael Posner, Ph.D.

University of Oregon

2 Musical Skill and Cognition

John Jonides, Ph.D.

University of Michigan

3 Effects of Music Instruction on Developing Cognitive Systems at the Foundations of Mathematics and Science

Elizabeth Spelke, Ph.D.

Harvard University

4 Training in the Arts, Reading, and Brain Imaging

Brian Wandell, Ph.D.

Stanford University

5 Dance and the Brain

Scott Grafton, M.D.

University of California at Santa Barbara

6 Developing and Implementing Neuroimaging Tools to Determine if Training in the Arts Impacts the Brain

Mark D’Esposito, M.D.

University of California, Berkeley

7 Arts Education, the Brain, and Language

Kevin Niall Dunbar, Ph.D.

University of Toronto at Scarborough

(Formerly at Dartmouth College)

8 Arts Education, the Brain, and Language

Laura-Ann Petitto, Ed.D.

University of Toronto at Scarborough

(Formerly at Dartmouth College)

9 Effects of Music Training on Brain and Cognitive Development in Under-Privileged 3- to 5-Year-Old Children: Preliminary Results

Helen Neville, Ph.D.

University of Oregon