

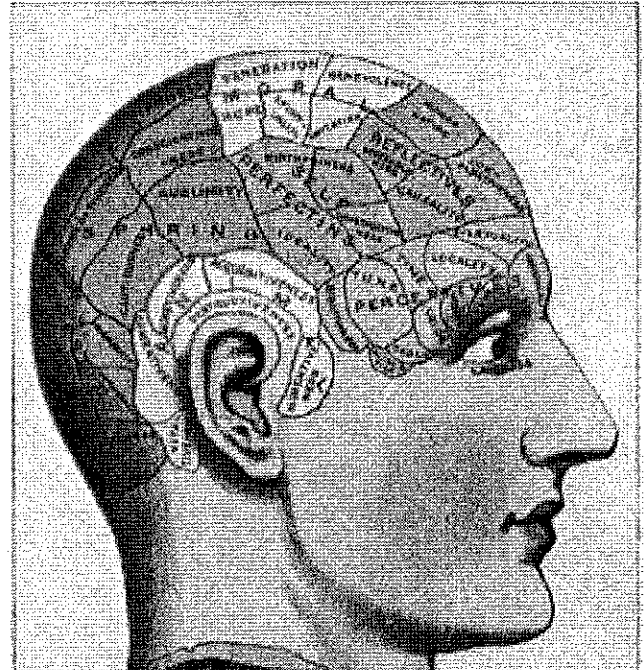
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What Kids Should Know About Their Own Brains

Annie Murphy Paul

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Neuroscience may seem like an advanced subject of study, perhaps best reserved for college or even graduate school. Two researchers from Temple University in Philadelphia propose that it be taught earlier, however—much earlier. As in first grade.



In a study published in this month's issue of the journal *Early Education and Development*, psychologists Peter Marshall and Christina Comalli began by surveying children aged four to 13 to discover what they already knew about the brain. Previous research had found that elementary school pupils typically have a limited understanding of the brain and how it functions, believing it to be something like "a container for storing memories and facts."

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Marshall and Comalli's questionnaire turned up the same uncertain grasp of the topic, which the researchers

attributed to several factors. First while parents and teachers talk often with young children about parts of the body and how they work, they rarely mention this most important organ. (A 2005 study by another group of scientists found that young children hear very few instances of the word brain in everyday conversation.)

Secondly, children can't observe their own brains, and so are left to guess about what's going on inside their heads—not unlike the state of ignorance in which adults dwelled for many centuries before the founding of neuroscience as a scientific discipline. And finally, most students aren't formally taught much about the brain until at least middle school.

Marshall and Comalli believe such instruction can and should begin much sooner.

A 20-minute lesson about the brain was enough to improve knowledge of brain functioning.

To that end, they designed a 20-minute lesson about the brain and delivered it to a group of first-grade students. Even this brief intervention, the psychologists report, "was enough to improve their knowledge of brain functioning as assessed three weeks later"; a control group of first graders, taught for 20 minutes about honeybees, showed no such improvement. Marshall and Comalli's neuroscience lesson was especially focused on teaching children about the role of the brain in sensory activities—that the brain is not just "for thinking," as many kids assume, but also for seeing, hearing, smelling, and feeling.

But the success of their effort opens another possibility. In a well-known body of research, Stanford University psychologist Carol Dweck has demonstrated that teaching students about how their brains work—in particular, that the brain is plastic and can develop new capacities with effort and practice—makes a big difference in how constructively kids deal with mistakes and setbacks, and how motivated they are to persist until they achieve mastery.

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Dweck's landmark studies were carried out with fifth-graders, and her program Brainology, a computerized

tutorial on brain function, is designed for students in fifth through ninth grades. But why wait to introduce these crucial concepts? Dweck's own research has found that children's attitudes and behaviors regarding achievement and failure are already in place by preschool. Parents' and educators' messages about the malleability of the brain and the importance of effort must begin even earlier: talk of "head, shoulders, knees and toes" and "this little piggy went to market" should also make room for mentions of growing brains.

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