

Academic Acceleration Gets Social Lift

Parents and educators often resist encouraging intellectually advanced teenagers to skip a grade or take special college-level courses, for fear the academic jump-start will wreak havoc on the students' social and emotional development. But according to a new study, this widespread fear doesn't make the grade.

Educational "acceleration" exerts no ill effects on social and emotional adjustment, at least among mathematically precocious youth, and it may even enhance peer-group relations among gifted female students, report psychologists Teri M. Richardson and Camilla P. Benbow of Iowa State University in Ames.

Their study, described in the September *JOURNAL OF EDUCATIONAL PSYCHOLOGY*, provides "compelling evidence" to dispel misgivings about alleged social and psychological side-effects of educational acceleration, comments psychologist Carol Tomlinson-Keasey of the University of California, Riverside.

Previous studies showed that students with extremely high academic ability, especially in verbal areas, have difficulties making friends and may develop a poor self-image during adolescence. However, Benbow maintains that these problems stem from factors associated with intellectual giftedness — such as increasing difficulties finding peers with common interests — rather than from accelerated study programs.

Richardson and Benbow studied 1,247 12- to 14-year-olds who scored in the top 1 percent on a national mathematics achievement test and exhibited intellectual abilities on the Scholastic Aptitude Test at the level of students four to five years older. Different types and amounts of academic acceleration were encouraged for each youngster, and about half of them accepted expedited regimens. The researchers assessed the students' social development at ages 18 and 23 with extensive self-report questionnaires, delving into such areas as educational and career aspirations, employment history, interests and activities, family encouragement, quality of friendships and opinions about the accelerated program.

Overall, youngsters in both groups at both ages reported feeling good about themselves and in control of their lives. Those in educationally accelerated programs reported no detrimental effects from skipping grades or taking college-level courses. Greater amounts of acceleration did not lead to greater social and emotional difficulties. By age 23, only about 3 percent of the accelerated students felt socially or emotionally hindered by their academic experience.

Accelerated female students reported

that the academic boost had slightly favorable effects on their social lives. Females in particular often fear that acceleration will lower their social standing with peers, Benbow says, and without adult encouragement, they often fall short of their academic potential.

Tomlinson-Keasey notes that the new findings confirm observations of intellectually gifted youngsters in accelerated programs reported in 1947 by the late Lewis Terman of Stanford University. But the importance gifted children attach to sociability and peer relations remains poorly understood, she says.

For example, a 60-year follow-up of 1,069 men and women in Terman's original sample, whose childhood IQs averaged 149, shows that those who were the most popular, sociable and optimistic as children displayed the least intellectual

skill and achievement as adults, report Tomlinson-Keasey and Riverside colleague Todd D. Little in the same *JOURNAL OF EDUCATIONAL PSYCHOLOGY*. Perhaps gifted youngsters decide to concentrate on either social or academic pursuits, the researchers speculate. Intellectual achievers may prefer solitude or the company of adults, they add.

Whatever the case, researchers should refrain from casting acceleration as a "horrible ogre" and should look at the drawbacks of *not* accelerating intellectually gifted children, Tomlinson-Keasey contends. "In regular classes, many of these children get bored, burned out on school and don't reach their intellectual potential," she says.

Adds Benbow, "Maybe we should study why so many educators are so unwilling to try academic acceleration." — *B. Bower*

Rare find: A teething dinosaur embryo

Last summer, geology student Rodney D. Scheetz peered through a microscope at fossil remains he had unearthed a few weeks earlier in Colorado, and found a paleontological surprise: 135- to 150-million-year-old fragments of a dinosaur embryo, the oldest yet reported in the Northern Hemisphere.

The Brigham Young University undergraduate found tiny embryonic foot bones, vertebrae and jawbone fragments of a gazelle-like, herbivorous dinosaur called *Dryosaurus altus*. Lower jaw pieces held two baby teeth, each roughly 1 millimeter wide, that had barely emerged past the jawbone — a sign that they belonged to an embryo just about ready to pop out of its shell, Scheetz says. Officials at Brigham Young, located in Provo, Utah, announced the discovery Sept. 21.

Judging from its well-developed bones, "the little guy that was curled up in the egg must have died just before it could hatch," Scheetz adds. By studying fossilized embryos, scientists can learn whether baby dinosaurs stayed in their nests or left after hatching and can glean clues to how dinosaurs cared for their young.

D. altus is only the seventh dinosaur species for which embryos have been recovered, says Philip J. Currie of the Royal Tyrrell Museum of Palaeontology in Drumheller, Alberta. Worldwide, scientists have unearthed fewer than 100 dinosaur embryos, he says. Most of these date back 65 to 100 million years.

While working in the fossil-rich Morrison Formation near Uravan, Colo.,



Jawbone fragment with a barely emerging, millimeter-wide tooth (upper right) from a *dryosaurus* embryo.

Scheetz also found dinosaur eggshell shards and the remains of eight individual *dryosaurus* ranging from hatchlings to young adults. The finds may shed some much-needed light on early dinosaur development — in this case, how the *dryosaurus*, which measured about 12 inches long as a fully developed embryo, matured into a 10- to 13-foot-long adult. Scheetz hopes for "a broader and better picture as far as what's going on with elementary growth in dinosaurs — how fast they grew and what kind of strategies they used in family life."

The excavated area may have been a nesting site for a herd of *dryosaurus*, says Wade E. Miller, director of Brigham Young's Earth Science Museum. To find out, Scheetz plans further screening of his fossils and a return to the site next spring.

— *I. Chen*