Behavior

U.S. complacency adds to math woes

Despite demands to bolster mathematics and science education, a study reported in the Jan. 1 SCIENCE finds that U.S. elementary and secondary school students given age-appropriate math tests in 1990 lagged behind their counterparts in Japan and Taiwan about as much as they did in 1980.

Complacent attitudes and beliefs among U.S. parents and students about education contributed considerably to this decade-long achievement gap, which widened between first and eleventh grades, contend psychologist Harold W. Stevenson of the University of Michigan in Ann Arbor and his colleagues.

Based on data collected in 1980 and 1984, Stevenson's team previously found that Japanese and Taiwanese first and fifth graders greatly surpassed their U.S. counterparts on a standardized mathematics test (SN: 1/31/87, p.72). They also noted that parents of U.S. grade schoolers held lower standards for math achievement and helped less effectively with math homework than did Asian parents (SN: 10/5/91, p.218).

A 1990 follow-up included 474 eleventh graders living in one of the three countries who had been tested as first graders in 1980, as well as nearly 4,000 additional eleventh graders from Japan, Taiwan, and the United States. About 240 fifth graders in each country also participated in the follow-up. Researchers interviewed nearly all mothers of fifth graders and of the previously tested eleventh graders.

Students completed math tests based on concepts and operations common to textbooks used in each country. Another test probed for general knowledge not usually learned in school. For example, it asked fifth graders to cite two things a plant needs to grow and queried eleventh graders on their notion of the economic concept of inflation. Kindergartners in the three countries also took a version of the general knowledge test.

The disparity noted in 1980 between the math scores of U.S. and Asian students increased for eleventh graders, a pattern that appeared most strongly in an analysis of all students tested rather than just those followed over time. On the general knowledge test, however, U.S. kindergartners and fifth graders outperformed their Asian counterparts, while eleventh graders scored equally well in all three countries.

U.S. parents said they often read and provided various types of cultural exposure to preschoolers, thus boosting youngsters' general knowledge, Stevenson's team notes. As children grew older, U.S. parents offered fewer such experiences.

In 1990, U.S. parents still cited greater satisfaction with their children's school achievement and the quality of their children's schools than did Asian parents. The latter group and their children rated hard work as the key to academic success, whereas U.S. parents and students emphasized innate ability.

Vietnam combat trauma: A family affair

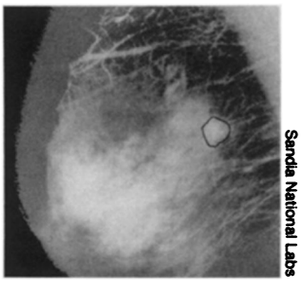
Post-traumatic stress disorder (PTSD) continues to exact a psychological toll not just on a substantial number of Vietnam combat veterans, but on their families as well, according to a report in the December JOURNAL OF CONSULTING AND CLINICAL PSYCHOLOGY. From late 1986 through May 1988, interviews were conducted with a random national sample of 1,200 Vietnam vets, 319 of whom suffered from PTSD, and with 376 spouses or live-in partners of the vets, including 122 married to or living with PTSD victims.

In the year prior to interviews, families of veterans diagnosed with PTSD experienced far more violent acts by both partners, more marital problems, more emotional distress, and a greater number of serious behavior problems among children.

Still, a sizable minority of families of vets with PTSD cope at least fairly well with personal and family problems, report psychologist B. Kathleen Jordan of Research Triangle Institute in Research Triangle Park, N.C., and her colleagues.

Biomedicine

Software search for breast cancer



Sandia National Labs

A computer program may one day help radiologists home in on very subtle breast cancers, those easily missed by routine mammograms.

Computer scientist Philip Kegelmeyer developed the software after learning that radiologists who screen mammograms, or X-ray pictures of the breasts, describe their task as nerve-racking, yet tedious. Radiologists may look at 100 routine mammograms to find just one cancer, he says. "They know that their attention can last for only so long," Kegelmeyer says. "At the same time, it's desperately important that they do a good job."

To give the doctor an edge, Kegelmeyer, who is at the Sandia National Laboratories in Albuquerque, N.M., designed a software program that analyzes digitized X-ray films of the breast. Kegelmeyer says some breast cancers are virtually invisible on the X-ray film. The only clue to their presence is a star-shaped distortion in the breast tissue (circled area). Experienced radiologists can detect these distortions, but fatigue and other factors can cause them to miss the signs of cancer.

Kegelmeyer's software program searches for this trouble spot on the mammogram and then alerts the radiologist.

In a recent test of the method, Kegelmeyer obtained mammograms from 85 women, 36 of whom had confirmed breast cancer. The remaining 49 women had no breast cancer.

Four radiologists read the X-rays without the computer's help, and Kegelmeyer recorded the results. Then he gave the doctors the same X-rays along with the computer's analysis, which highlighted areas that looked like cancer.

With the extra help, the radiologists increased their ability to detect breast cancer by about 10 percent, Kegelmeyer says. Furthermore, the computer program did not increase the risk that the radiologist would mistakenly label a suspicious area as a probable cancer, he says. Such false positives can cause needless anguish, he notes.

Yew needles join the cancer battle

Taxotere, a drug derived from the needles of the European yew tree, has shown promise in fighting cancer.

Richard Pazdur of the University of Texas M.D. Anderson Cancer Center in Houston and his colleagues studied the safety of taxotere by giving varying amounts of the drug to 39 cancer patients. The 39 participants had a variety of malignancies, including ovarian, colon, breast, and uterine tumors, and had failed to benefit from previous cancer treatment.

Pazdur's team discovered that at very high doses of taxotere, cancer patients suffered hair loss, mouth sores, and a low white blood cell count.

Although not designed to assess taxotere's efficacy, the study found the drug had antitumor effects in six of the 10 women who had ovarian cancer. The team also reported a positive response in one woman with breast cancer.

Although the study is small, the results appear encouraging. "It is highly unusual to have this level of activity in a Phase I study, since most of these patients had been heavily treated and their cancer was still progressing," Pazdur says.

The findings are of particular importance because the European yew tree is not scarce. Another drug, taxol, has also shown promise in fighting cancer. But taxol — approved last week by the Food and Drug Administration for treating advanced ovarian cancer — is derived from the bark of the rare Pacific yew, whose use some feared might endanger the tree's survival.