

# SCIENCE NEWS

This Week

## Asian Kids' IQ Lift

Reading system may boost Chinese scores

Learning to read 2,500 pictorial symbols, as Chinese students do in grade school, yields a 5-point advantage on IQ tests, compared with the scores of Westerners whose languages are based on alphabets, according to a new analysis of mental capabilities of Greek and Chinese children. The international team of analysts, led by psychologist Andreas Demetriou of the University of Cyprus in Nicosia, attributes the scoring disparity to a superiority in visual and spatial tasks that comes with learning to read Chinese.

"Our findings support the assumption that reading and writing systems are powerful methods for influencing the development of mental abilities, and perhaps brain growth, in individuals and in cultures," Demetriou says.

First, the team considered a measure of general intelligence derived from IQ scores (*SN*: 2/8/03, p. 92). Overall, Greek and Chinese kids exhibited comparable general intelligence despite a slight IQ advantage for the Chinese. This new finding, which appears in the March/April *Intelligence*, undermines the controversial proposal of an innate intelligence advantage for Asians, as compared with whites. That view is supported by recent reports of slightly larger brain sizes, corrected for body size, among Chinese people.

Demetriou and his colleagues tested 120 Greek and 120 Chinese schoolchildren, ages 8 to 14. The group included an equal number of boys and girls from each country and from each grade. Most of the kids came from middle-class families.

Each child completed age-appropriate tests of mental speed and efficiency, memory, and reasoning aptitude. Test problems

in these areas contained verbal, mathematical, and spatial information.

Chinese children outscored their Greek peers by 5 to 7 IQ points.

The pattern of findings at different ages indicates that the edge derives almost entirely from the honing of spatial sensibilities in Chinese readers, Demetriou says. Extremely small proportions of both Chinese and Greek 8-year-olds scored high on spatial problems. By age 12, however, 18 percent of Chinese kids ranked as highly efficient visualizers, compared with 6 percent of Greek children. That gap slightly diminished by age 14, with 26 percent of Chinese and 16 percent of Greek youngsters qualifying as particularly good visualizers.

The study shows that "what have previously been argued to be differences based on biological qualities can be explained by differences in experience that often vary with racial or cultural membership," remarks psychologist Marc Lewis of the University of Toronto.

Demetriou acknowledges that his interpretation of the data requires that additional experiments show that Westerners who learn to read only Chinese score higher on spatial tasks than do Chinese who learn to read only an alphabetic language.

The new evidence that the Chinese writing system influences spatial perception "is plausible but far from definitive," says Yale University psychologist Robert J. Sternberg. For instance, he notes, Asians might possess an evolved spatial facility that promoted their adoption of pictorial symbols in writing rather than alphabetic ones.

Canadian psychologist J. Philippe Rushton of the University of Western Ontario in London says that other evidence leans toward a biological basis for the IQ differences. "Something innate" gives the Chinese a mental edge over whites, he says, noting that Chinese kids adopted at birth by U.S. parents also tend to score higher on IQ tests than their white peers do. Rushton champions a controversial evolutionary hierarchy of racial intelligence in which East Asians come out on top. —B. BOWER

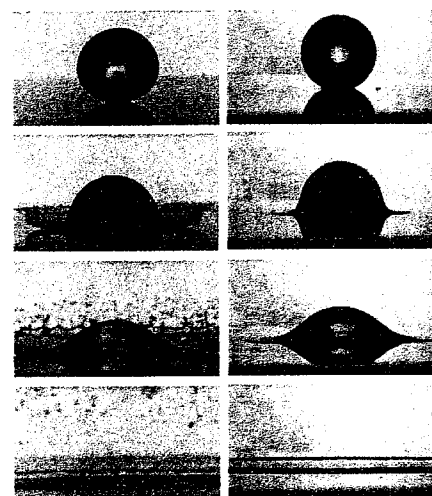
## Dial-a-Splash

Thin air quells liquid splatter

In a classic image of high-speed photography, a drop of milk landing on a surface explodes into an ornate crown with beads of fluid leaping from its rim. Now, a study of other splashes finds that the air in which

such bursts unfold is a previously overlooked actor in that performance.

"I don't think anyone ever thought poor little old air could do anything to the splash," says physicist Sidney R. Nagel, who led the investigation. Yet he, Lei Xu, and Wendy W. Zhang, all of the University of Chicago, have discovered that even modestly reducing the air pressure completely quells the rococo exuberance of crashing drops.



**AFTER THE FALL** In air at normal pressure (left), an ethanol drop spatters into a delicate and elaborate crown upon striking a glass slide. At 17 percent of ordinary pressure (right), the drop makes no splash.

"Flabbergasting," comments Detlef Lohse of the University of Twente in Enschede, the Netherlands.

Nagel, Xu, and Zhang made their unexpected observations while releasing alcohol drops onto glass slides in a sealed chamber with adjustable air pressure. To monitor the impacts, the team filmed them at 47,000 video frames per second.

The experimenters also found that replacing air with lighter gases, such as helium, diminished splashing and that heavier gases, such as krypton, enhanced it.

To explain their results, the Chicago researchers posit that the leading edge of a fallen, squashed drop rushes outward, compressing a thin layer of gas next to the glass surface. At normal pressure, as the gas resists this compression, it forces up the film's edge, which then breaks up. The result: a splash.

But at reduced pressures—or if the gas is light—the compressed gas resists less vigorously, generating a weaker splash or none at all. The splash is "very tunable," Xu says.

The team details its findings in a report on the Internet site called ArXiv, where physicists often post new results ([www.arxiv.org/abs/physics/0501149](http://www.arxiv.org/abs/physics/0501149)).

Splashing occurs, for better or worse, in many industrial processes, such as fuel combustion, ink-jet printing, and the coating and washing of various products. The Chicago findings could have practical

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