Behavior

Wray Herbert and Joel Greenberg report from Washington, D.C., at the meeting of the American Psychological Association

Learning disability: Sexual parity

Boys are so consistently overrepresented among children with learning disability—a deficit in spatial orientation that predicts poor reading skills — that it has come to be viewed as a male disorder. The proportion of boys to girls in clinical populations has been reported to be as high as ten to one, and it commonly runs about three or four to one. Recent research by three psychologists, however, indicates that while boys may be referred more often for help with their learning problems, the distribution among boys and girls is fairly even. According to Amy Karlen and Rosa A. Hagin of Fordham University and Ronnie Beecher of the New York University Medical Center, over 12,000 kindergartners and first graders from 47 schools were extensively tested for various signs of learning disorder. In the samples drawn from inner city, rural and private schools, the researchers found no sex differences in the incidence of learning disorders. In the suburban sample boys were significantly overrepresented, but even in the suburban schools the ratio of boys to girls was about 1.5 to 1 — much lower, the researchers note, than the commonly reported ratio. These findings indicate, the researchers say, that girls with fundamental learning problems are not being identified in the classroom, perhaps because teachers have different expectations for boys and girls or perhaps because boys and girls cope differently; boys deal with failure through aggression, they say, while girls tend to become withdrawn. Whatever the reason, they conclude, girls are being denied the help that might prevent ultimate school failure.

His language, her self-concept

The past decade's effort to purge sexual bias from the English language has been only marginally successful. Those who would conserve the language have argued that nouns such as *mankind* and pronouns such as *he* and *his* are sexually neutral. While this may hold true for adults, recent research indicates that young children may not read these words as sexually neutral and that the perceived male bias in the language may influence the development of social roles and self-concept. Psychologist Janet Shibley Hyde of Denison University in Ohio studied groups of first graders, third graders, fifth graders and college students to see how they interpreted the grammatically neutral word *his*, the word *their*, and the form *his or her*. Cueing the subjects with one of these words in a sentence, she asked them to make up a story about a fictional character. She found dramatic differences in the results: when the subjects were cued with *his*, only 12 percent of their stories were about females; when cued with *their*, 18 percent were about females; and when cued with *his or her*, 42 percent. Elementary school children were much more likely than college students to interpret the grammatically neutral *his* as masculine, Hyde reported, suggesting that for young children the word is not psychologically neutral.

'Blowing the whistle' on patients

Should a clinical psychologist or other therapist inform the police — thereby divulging a professional confidence — if a patient threatens harm to another person or himself? "I can't blow the whistle on them, regardless of the APA guidelines," says Theodore H. Blau, a private practitioner in Tampa, Fla., and former APA president. The APA ethical code gives the therapist the option of warning authorities in such instances. Blau's decision comes from this self-assessment of his own practice: Out of the 4,000 patients he's seen, 2 have actually proved to be harmful to themselves or others (one of each); 400 have *threatened* to do such harm. "Therefore," says Blau, "I know that 199 out of 200 will not follow through."

Technology

Ivars Peterson reports from San Diego, Calif., at the 15th International Congress on High Speed Photography and Photonics

Explosives and bursting microballoons

Explosives manufacturers have learned that mixing in air bubbles sensitizes an explosive so that a small charge sets it off and the detonation spreads smoothly. To provide the necessary air pockets, manufacturers often add microscopic glass or plastic "balloons" to commercial explosives. Recently, M. Munawar Chaudhri of the Cavendish Laboratory in England and Lars-Åke Almgren and Algot Persson of Nitro Nobel AB in Sweden used high-speed photography to investigate why adding microballons works. They looked at the interaction of shock waves with hollow spheres submerged in water.

The investigators used thin-walled glass bubbles and hollow aluminum spheres (up to 10 millimeters in diameter) held in position by a fine thread or wire. An explosive charge placed near a sphere generated a shock wave that traveled through the water. The event, lasting less than 25 microseconds, was photographed with a 0.1-microsecond exposure time for each frame.

The researchers discovered that as soon as a high-intensity (more than 15,000 times atmospheric pressure) shock wave from the detonated charge hits the bubble, the wall starts to collapse. This rapid collapse produces a narrow jet of material that speeds across the void and strikes the opposite wall. There it generates a second shock wave that can be even more intense than the first, and the spot heats up. This asymmetric deformation of the bubble is called "jetting."

Nitro Nobel AB

The first photograph shows a hollow aluminum sphere with an explosive charge to its right. The second photograph, taken 5 microseconds after detonation, shows the expanding detonation products (black area), the charge-initiated shock wave (large arc), and the shock wave (S_2) generated by the wall collapse.

Chaudhri says jetting plays a vital role in the initiation and propagation of an explosion in a bubble-containing explosive. The bubbles seem to act as concentrators, creating "hot spots" that provide the localized high temperature needed to start and keep the chemical reaction going during an explosion.

An explosive optical challenge

The mission was to record a 2-millisecond explosion using high-speed cameras. Rich Oyama and his crew at the Lockheed Missile and Space Co. in Santa Cruz, Calif., had only one chance to obtain displacement and time data on the motion of the inner wall of a steel cylinder, 3 inches thick, 45 inches in diameter and 70 inches long, surrounded by 700 pounds of high explosive and buried under tons of sand. Oyama was faced with the problem: "We are going to blow up your cameras — how are you going to get the data?"

A special reflecting prism, set in a narrow, concrete passageway, guided light from a flash system inside the cylinder to the camera, 19 feet away, and allowed a view of all sides of the cylinder's interior. To keep the explosion's initial shock waves from shaking the camera, the engineers used explosive bolts to release the cameras from a steel beam so that they were in free fall during the microsecond flash exposures. A laser beam aligned the cameras and mirror. Sychronizing the operation was crucial.

The result was a massive explosion that twisted steel beams and flung the cameras 50 feet. The cameras survived to show the tale.