

## Put on a happy face

A smile may not be an umbrella, at least not for infants under 1 year old. Investigators at the National Institute of Child Health and Human Development (NICHD) in Bethesda, Md., report that babies who do a lot of smiling tend to be less securely attached to their mothers when they reach 2½ years of age than babies who smile less often.

"We're not sure why this happens," says NICHD psychologist Peter M. Vietze. "More smiling at 6 months of age may reveal anxiety about affection from the mother."

Vietze and colleagues studied 68 firstborn infants and their parents. Smiling and other emotional expressions were tracked at home during parent-child interactions and in the laboratory as infants learned to use toys of varying complexity. Data were collected at ages 6 months, 12 months, 15 months and 30 months.

When studied systematically, emotional expression is rare among infants, says Vietze, but it punctuates important parts of learning. Contrary to most developmental theories, infants do not always display positive emotions during goal-directed activity or upon successful completion of a task, he notes. For example, the first time a toy is explored an infant may beam, but after that smiling tends to decrease. "There may be enjoyment in doing, not necessarily in succeeding," says Vietze.

Although fathers in the sample were not primary care-givers, the researchers find that a father's responsiveness to his child is significantly related to the infant's ability to successfully manipulate toys.

All infants smile more as they get older, especially girls, say the researchers. Parents, on the other hand, tend to smile less at infants as the children get older. By the time babies are 1 year old, parents may smile at selected activities, says Vietze. The investigators also report that a child's temperament and frequency of smiling do not appear to be related.

## Female victims: The crime goes on

Female crime victims, especially those who have been raped, continue to be victimized by a sharp increase in mental health problems after their initial ordeal. Nearly one rape victim in five reports an attempted suicide — a rate that is more than eight times higher than that of nonvictims, according to psychologists at the Medical University of South Carolina in Charleston.

Data were collected from 2,004 randomly chosen adult female residents of Charleston County, S.C. Female interviewers conducted the survey by telephone, using a questionnaire devised by Dean G. Kirkpatrick, Connie L. Best and Lois J. Veronen.

According to the self-reports, 100 women had been raped, 79 experienced an attempted rape, 55 had been sexually molested, 37 experienced an attempted sexual molestation, 65 had been robbed, 33 underwent an attempted robbery, 48 survived an aggravated assault and 1,564 were nonvictims.

The researchers note that 52 percent of all the women who attempted suicide were crime victims. Suicide attempts among victims of rape, attempted rape, attempted robbery and attempted molestation were at least three times greater than among nonvictims.

Victims of rape, attempted rape and robbery also reported a rate of "nervous breakdown" that was at least twice as high as the rate for nonvictims. The researchers describe a nervous breakdown as "a relatively serious inability to cope and disruption of normal adaptive behavior."

Mental health problems occur most frequently among victims of rape, attempted rape and attempted molestation, conclude the investigators. Why are the effects of an attempted molestation worse than those of a completed molestation? The researchers are not sure, but point out that "attempted attacks leave much room for ambiguity in the victim's mind as to what the assailant intended and as to the actual danger she was in."

## Enzyme filter thickens thinned blood

The blood thinner heparin probably causes more deaths in otherwise healthy patients than any other drug used in the United States, says Robert Langer of the Massachusetts Institute of Technology. Yet the compound is necessary to keep blood from clotting as it makes its way through dialysis machines and the pumps that reroute blood during heart surgery. To help minimize the risk of hemorrhaging in these patients, Langer and his colleague Howard Bernstein are fine-tuning a new enzyme process designed to filter out the added heparin before the blood is returned to the body.

Tests in dogs and sheep show that the process can successfully remove 99 percent of the blood additive without significantly slowing the flow rate of the blood, Langer says, and the scientists hope to begin testing the process in human patients within the next several years.

The filter is a small chamber packed with tiny plastic beads that have been coated with the bacterial enzyme heparinase. The enzyme selectively breaks down the heparin into harmless carbohydrates without damaging blood cells.

Cynthia Sung, a student working with Langer, described preliminary results of a modification of the technique that might eventually give doctors a safe and effective new approach to treating severe jaundice in newborns. Instead of heparinase, the researchers substituted in their filter a fungal enzyme that chemically cleaves bilirubin, the reddish-yellow bile pigment that can cause serious illness if blood levels get too high.

Jaundice is fairly common in newborns, Sung says, and can be caused by an obstruction of bile ducts in the kidney, excessive destruction of red blood cells or liver maladies. A buildup of bilirubin in the skin gives jaundiced patients their characteristic yellow tinge. Usually the condition goes away without treatment, or after treatments with blue light. But severe cases, which most often afflict premature infants and can lead to deafness, mental retardation or seizures if untreated, have traditionally required transfusions that completely replace the child's blood supply.

The enzyme filtration might eventually be more effective than light therapy and safer than transfusions in treating the severe cases, Langer says, though he cautions that the preliminary animal tests of the technique's usefulness have barely begun.

## Re-dressing Romans in vibrant color

In A.D. 90, when Roman armies marched through England, "they went around in bright red tunics, and maybe purple socks," says George Taylor, a physical chemist from York, England, whose analysis of recent archaeological finds is casting a new light on views of the colors worn in long-buried civilizations.

Scientists had earlier supposed that the natural dyes common to the area produced only muted, drab colors, Taylor says. But when he and his colleagues turned modern analytical techniques on textile fragments from a Romano-British settlement unearthed several years ago in northern Britannia, they found evidence of vibrant reds and purples.

At first glance, all the bits of cloth were heavily stained from their 2,000-year entombment. "You could have any color you wanted, as long as it was dirty brown," Taylor says. But a closer chemical check revealed that nine of the 53 pieces collected retained an identifiable dye.

Several of the fragments were dyed red with madder, a plant not indigenous to Britain and probably imported to the area by the Romans, Taylor says. One bit of cloth was especially interesting, he says, because it contained the residue of a fragile, "beautiful purple dye" thought to have been prepared from fermented lichens. Analysis of wool and silk fragments from a much younger civilization — a 1,000-year-old Viking community at what is now York — produced evidence of the same lichen purple, showing the dye's continued use into modern times.