Behavior

Joel Greenberg and Bruce Bower report from Toronto at the annual meeting of the American Psychological Association

Probing sudden infant death

In the continuing search for clues to Sudden Infant Death Syndrome (SIDS), researchers have long thought that apnea may be a key contributor to these unexplained deaths. Indeed, apnea—the cessation of air flow to the lungs—appears to be involved in all SIDS deaths, which generally claim infants between 2 months and 4 months of age.

But results from a study of nearly 500 infants in Oklahoma City suggest that the role of apnea in the occurrence of the syndrome may not be as significant as was previously believed. Of the children studied—referred by parents who thought they detected a stoppage of breathing while the children were sleeping—68 percent were actually found to have some type of respiratory abnormality, including more than the normal number of apneic episodes during sleep (general apnea is common in most infants and may occur as often as three or four times per hour). "The vast majority [of these abnormalities] were harmless," says William Orr of Presbyterian Hospital in Oklahoma City. While acknowledging that "a small population of those with abnormal apnea will die later of SIDS," Orr concludes that "apnea has been overemphasized as a precursor" to the syndrome.

Orr says that common apnea, which is not thought to involve any anatomical abnormalities, may prove to be less important than the less prevalent obstructive apnea, in which the base of the tongue somehow falls back to block the airway during sleep.

Lewis P. Lipsitt, director of the Child Study Center at Brown University in Providence, R.I., says that Orr's findings that common apnea per se may not be a major predictor of SIDS could fit with his own theory that the affliction might result from an early learning or memory deficiency (SN: 4/15/78, p. 234). Apnea without any apparent physical cause, he notes, is often described in infants as "forgetting to breathe."

Ultimately, sudden infant death is the result of cardiac death (which follows the cessation of breathing). Joan A. Holloway and Kay A. Dey of the University of Oklahoma Health Sciences Center in Oklahoma City studied the heart rates of infants who exhibited above-normal amounts of apnea and those who were within the normal range.

In data she describes as "very preliminary," Holloway reports that at 2 and 4 months the apneic infants have a greater mean basal heart rate and more heart rate variability. While at 6 months these differences disappear, another difference seems to develop: The heart response to a novel stimulus (such as a tonal noise) continues to "mature" in the control infants, but remains at the same level for the apneic children. In this case, maturation means that the heart rate decelerates in response to such a stimulus; Holloway and her colleagues found that the deceleration in apneic infants at 6 months is the same as it was at 4 months. This could signal either a subtle heart abnormality or an "attentional" difference, she says, but it is too early to say definitively.

Survivors of spouse suicide

Researchers from the University of North Carolina at Charlotte report that outsiders view survivors of a spouse's suicide as being more responsible for that person's death than if he or she had died as the result of an accident or leukemia. Such a situation was seen as more shameful and as requiring more time for the spouse to recover, and the outsider's interaction with the spouse of a suicide victim was viewed as a greater source of discomfort.

"Adults who are survivors of a spouse's suicide face a difficult crisis which can be made even more difficult by the blame others may attribute to them and the discomfort others may feel in their presence," say the researchers—Lawrence G. Calhoun, James W. Selby and Peggy B. Walton — who studied the reactions of 60 males and 60 females.

The mystery of hyperactivity

Hyperactivity remains one of the most puzzling areas of the behavioral sciences. "Hyperactive kids continue to baffle and challenge everybody who studies psychopathology," says Barbara Henker of the University of California at Los Angeles. Among the enigmas permeating hyperactivity is the success of certain stimulant drugs with a significant number of such children—a result just the opposite of what would be expected with overstimulated youngsters.

Perhaps further confounding the issue is a report by Virginia I. Douglas of McGill University in Montreal. "The literature says that stimulant medication does not help [hyperactive children] in academic tasks," she says. But in her recent work, Douglas observed a 20 percent improvement in the ability to do math problems correctly after hyperactive youngsters received such medication.

Such youngsters were also better able to correct their own mistakes, she reports. "At least to a point, stimulant drugs can help" in academics, she says.

Henker notes that many hyperactive children will build "negative reputations" among their peers, and that she and her colleagues are able to identify half of such problem youngsters after only one day of observation in a special program designed to treat youngsters who are hyperactive. One hypothesis suggests that hyperactive children are somehow deficient in social knowledge and comprehension; that "they don't know what to do when they go to McDonalds or a soccer game," Henker says. "But studies indicate this is not the case—they seem to know what to do, but they don't do it."

Henker and her colleagues tested 24 hyperactive youngsters and 24 normal children and found that the hyperactives were better at identifying bad behaviors in their peers (such as who causes trouble) than they were at identifying good behaviors (such as who is the good student or athlete).

Herbert C. Quay of the University of Miami notes the hypothesis that hyperactivity falls into one of two neurological classes: One involves an underfunctioning behavior-inhibition system (most of these youngsters respond to stimulant drugs); the other involves an overactive reward system, in which the child is driven almost solely by the promise of reward (most of these children do not respond to stimulants).

The politics of memory

When did the Soviet Union invade Afghanistan? Chances are, you can remember the year, but first you will mentally refer to the United States' 1980 boycott of the Olympic Games in Moscow.

When did the tragedy at Jonestown in Guyana take place? You can probably peg an accurate year to that event, too, but first you will recall a personal event that occurred around the same time.

These two memory styles—using public events to help recall political occurrences and autobiographical information to reconstruct nonpolitical events—appear to be common strategies for dredging up data about public events in general.

In two recent experiments, Norman R. Brown, Steven K. Shevell and Lance J. Rips of the University of Chicago asked a series of questions such as those above to 39 graduate students. Subjects were able to accurately date most of the public events they were asked about. But the nature of the events significantly affected the way in which they were recalled. Over 60 percent of subjects' references to political events involved public incidents, while only one-quarter of their references to nonpolitical events involved public episodes.

"Personal information is frequently retrieved when one attempts to put a date on a public event," says Brown. "Facts about political events, however, tend to be more generally recalled. Facts about nonpolitical events are autobiographically recalled."

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."

Chemistry

Deborah Franklin reports from Philadelphia at a meeting of the American Chemical Society

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 it 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.