CHILD DEVELOPMENT

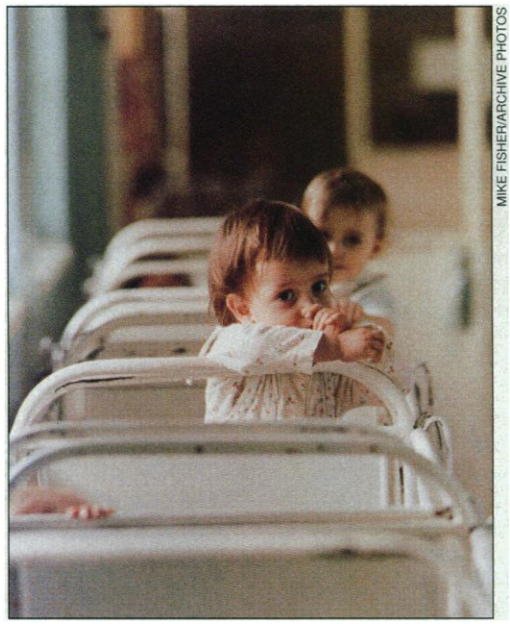
Small Refugees Suffer the Effects of Early Neglect

The moment Thais Tepper laid eyes on little Drue, she knew he was "in deep trouble." It was 1991, and she and her husband had traveled from their home in Pittsburgh to a courthouse in Arad, Romania, for a first meeting with the child they were adopting. He had been described to them as a "healthy little boy who's living with his mother." But as she found out later, the 18-month-old had spent most of his life at a state-run maternity hospital. He couldn't sit up, and his head was flattened on one side from curling up next to the bottle that had been attached to his crib as if he were "a hamster," she says. Back in the United States, child development experts assured her that Drue would be fine. But a year later, he was still scarcely making a sound. Even after 2 years, he remained so withdrawn that when he fell down and hurt himself, he wouldn't cry. He had also become disturbingly aggressive, flying into arbitrary rages.

Drue is one of a wave of Eastern European children who in the wake of the breakdown of the Soviet bloc have found adoptive homes in Western Europe and North America. The bleak conditions in which many of these children spent their early days have left them with a host of behavioral and physical problems for their new parents to cope with. And these small refugees have also attracted interest from scientists who study how early deprivation can alter brain chemistry and behavior.

Romanian orphans in particular present a huge, tragic experiment in early deprivation. Many spent months or years in orphanages where they were fed and diapered on military-style schedules, with little or no playing, cuddling, or talk. After the regime of dictator Nicolai Ceausescu was overthrown in 1989, the world was gripped by stories of children who stared blankly at visitors, who were uncannily silent because they had learned that crying brought no response. The orphans are "by far the biggest group of deprived babies we've [been able to study] so far," says child psychiatrist Michael Rutter of the London Institute of Psychiatry.

With tools ranging from brain scans to intelligence quotient (IQ) tests, researchers are trying to understand both biochemically and behaviorally the toll taken by deprivation and the extent to which the damage can be undone. Much of the work is still preliminary, and the results are endlessly confounded by such factors as maternal drinking and smoking and the heavy industrial pollution in Eastern Europe. Nonetheless, researchers hope to get more precise answers than ever before.



MIKE FISHER/ARCHIVE PHOTOS

No comfort. Many Romanian children languish for months or years in state-run orphanages.

Scientists have a rich store of animal studies to help guide them as they seek to understand how early neglect can shape the developing brain. They include Harry Harlow's landmark studies, conducted during the 1950s at the University of Wisconsin, of monkeys who never matured socially after being reared without mothers, and studies of rats showing that lack of maternal stimulation disrupts endocrine functioning. Scientists suspect that all this can happen to deprived young humans too. Indeed, neurobiologist Mary Carlson of Harvard University, who worked in Harlow's lab as a student, relates that many of the orphans she saw in Romania were withdrawn and engaged in rocking and other stereotyped behaviors that reminded her of Harlow's socially deprived primates.

Carlson and her husband, Harvard psychiatrist Felton Earls, have been exploring stress hormones in these children. The rat studies had suggested that early neglect can permanently alter the functioning of the hypothalamic-pituitary-adrenal (HPA) axis, a system that regulates stress, sex, and growth hormones. One such hormone is the stress hormone cortisol, which, in humans, has been linked to attentional problems and attachment disorders, both of which are often seen in institutionalized children. So Carlson and Earls compared cortisol levels in saliva from institutionalized toddlers who had been thoroughly neglected and from children who had spent 13 months in an "enriched environment" with more caretakers. But the results were inconclusive: Both groups had unusually high cortisol levels.

Neurologist Harry Chugani of Wayne State University Children's Hospital in Detroit did find neurological differences when he looked at a handful of Romanian adoptees with positron emission tomography (PET): Their brains seemed to use glucose, the brain's basic fuel, at an unusually high rate. Chugani did PET scans of four adoptees and compared them with data from age-matched controls. "The scans [from the adoptees] are all quite abnormal," says Chugani. Resting glucose metabolism values are about 50% higher than normal in every area of the brain. Also, glucose metabolism in the children's frontal lobes was lower than in other parts of their brains—a pattern that Chugani says is associated with attention-deficit disorder.

Chugani is taking blood samples from the children for future cortisol testing, and he intends to do PET scans on several more of the adoptees, who are being brought to Michigan by ABC-TV, which is airing a special about them on the 19 December *Turning Point*. He allows that his results are still preliminary, but suggests that because all the children he has tested have lived with their adoptive families for at least 2 years, the effects he is seeing are probably more than transient.

Some researchers are skeptical, however, that physiological tests on such a mixed group of children—including many abandoned because of retardation or medical problems—will yield meaningful results. Neurobiologist Seymour Levine, professor emeritus at Stanford University, says "These are interesting results. ... [But] the studies are lacking a lot of very critical controls." Cortisol is especially dicey: Because levels change rapidly and are highly responsive to circumstances, says Levine, "one of the hardest things to do is to get a basal level." He also points out that small changes in the timing of stressful events can make a big difference in outcomes. "If you subject a 3-day-old rat to maternal deprivation, it will hypersecrete stress hormones later in life." But if you deprive a rat when it's 11 days old, "then the HPA system becomes hyporesponsive." Says Levine: "A human infant's age at the time of institutionalization could be just as crucial."

Another neurobiologist, who prefers not to be quoted, also argues that some measures

may be too blunt to say anything about the effects of early stress or deprivation. For instance, he says, high glucose metabolism is commonly seen in people who are mentally retarded or doing unfamiliar tasks—as would be true of many of the adoptees.

But as these scientists point out, it's not these children's chemistry but their behavior—and the extent to which they can recover from neglect—that really matters. One study of adoptees, led by psychologist Elinor Ames of Simon Fraser University in British Columbia, suggests that the severity of impairment is proportional to the length of institutionalization. The researchers have been comparing three groups of children: Romanian adoptees who spent 8 months or more in an institution; Romanian children who were adopted by the age of 4 months; and age- and sex-matched controls of British Columbian children living with their own families. On measures of attachment and socialization, the early-adopted group resembled the controls. The late-adopted group, by contrast, was more withdrawn and more likely to engage in stereotyped behaviors, such as rocking. They also had more eating problems, including refusing solid food and eating excessively.

Follow-up testing 3 years after adoption, when children were between 4 1/2 and 8, suggests that while early problems fade, they don't go away. "The longer a child had spent in an orphanage, the more behavior problems he or she had 3 years later," Ames says. Parents of the late-adopted children reported some improvement in the children's "attachment security," as measured by willingness to explore independently, among other behaviors. But many still were "indiscriminately friendly," a common aftereffect of institutionalization. Numbed by neglect, they are often unable to form more than superficial attachments, but at the same time their need for attention is so strong that they will accept it from anyone. Many late adoptees also still had symptoms of depression or withdrawal, including a tendency to stare blankly. But, like little Drue Tepper, "their main behavior problems [had become] poor control of temper, fighting, or demanding attention," says Ames.

Still, findings from two other adoption studies suggest that most children have a remarkable ability to recover from the effects of early neglect. Psychologist Susan Goldberg of Toronto Children's Hospital has studied 56 Romanian children, aged 2 1/2 to 5 years, 19 of whom had been institutionalized for up to 4 years. While some still showed the indiscriminately friendly behavior familiar to orphan-watchers, "when we looked at them as a group, the really striking thing was how well most of these kids had done," she says. All had formed some kind of attachment, and their English language skills were within the normal range.

The largest scale adoption study is being conducted by Michael Rutter in London, who has been tracking 166 children adopted from Romania into the United Kingdom. Rutter calls them an "extraordinarily deprived group," many of whom were institutionalized for more than a year and about half of whom were in the bottom third percentile in height, weight, and other bodily measurements. Rutter tested the children at two time points—ages 4 and 6. In language development, physical growth, and ability to make emotional attachments, the children have made a "spectacular recovery," he says. They are still lagging behind, though, in IQ—by about 10 points—and in social behavior as shown by problems in submitting to school discipline and in "picking up social cues."

Even though mixed and tentative, the results from these studies are reaching an eager audience—the thousands of parents who adopted Eastern European children. "We've been contacted by 3000 people," says Tepper, who has launched a national parents' group. She and neuropsychologist Ronald Federici of Alexandria, Virginia, have organized a meeting for parents and experts to be held next weekend in Arlington, Virginia. And although scientists may never be able to quantify the effects of early deprivation, the studies are driving home one clear message, says a scientist: "You need to be nice to people, and especially developing people."

–Constance Holden

BREAST CANCER

Activists Vote $14 Million for Research

During a tense meeting on 7 November, breast cancer activists took an extraordinary step: They rejected an attempt to build a small fiefdom on their behalf in the U.S. Department of Health and Human Services (HHS), arguing that the money should be spent instead on peer-reviewed research. As a result, the National Cancer Institute (NCI) is likely to get an extra $14 million for research in 1997. This shows, as one activist said, that "we don't want to be perceived as just another special-interest group."

The activists' move was an embarrassing defeat for Susan Blumenthal, director of HHS's Office on Women's Health. She is in charge of administering the National Action Plan on Breast Cancer, a strategic plan that Congress directed HHS to develop after breast cancer activists lobbied for it. Congress earmarked $10 million of NCI's budget for the plan in 1995 and $14.75 million in 1996. The Administration, with Blumenthal making the case, sought $20 million for 1997, and Congress again approved $14.75 million. But activists have grown unhappy with Blumenthal's strategy to inflate the plan and make it a permanent adjunct to her office.

Dissatisfaction surfaced this summer in letters from Frances Visco, the Philadelphia attorney who presides over the National Breast Cancer Coalition, to Senator Arlen Specter (R–PA), chair of a subcommittee that drafts the HHS and NCI budgets. On 23 July, Visco wrote to say her influential group wanted to see breast cancer research at NCI expanded, and to avoid diverting money from "quality" research, she asked that no more than $4 million be set aside for the Action Plan in 1997. Specter, however, sought $14.75 million. An aide says it seemed the least controversial thing to do. But on 10 October, after the bill passed, Visco wrote Specter, reminding him that she represents 350 organizations and insisting that the earmark was "too much money."

The disagreement came to a head on 7 November when the steering committee of the National Action Plan—co-chaired by Blumenthal and Visco—met at a Washington, D.C., hotel to vote on how the $14.75 million should be used. Blumenthal was pushing what she calls a "broad program" to sponsor not just research, but education, mammography for the poor, new treatment initiatives, and other "crosscutting" agency activities. The panel was not persuaded. At one point, panel member Kay Dickersin, a University of Maryland epidemiologist and member of Visco's coalition, asked: "Is there anyone on this committee who agrees [with Blumenthal's position]?" Apparently no one did. The committee voted 13–0, with four abstentions, to send all but $750,000 of the money to NCI for peer-reviewed research. (The plan would have about $4 million available in unspent money from last year.)

Blumenthal's reaction: "It represents a genuine difference of philosophy." She concludes that the steering committee was so tight with NCI that it had "a vested interest in holding onto that money" for research. "I see it as a missed opportunity" to launch new prevention programs, she adds. Visco responds: "It may be a missed opportunity for Susan Blumenthal, but not for breast cancer research."

Now it's up to HHS Secretary Donna Shalala to decide what to do with the $14.75 million. A spokesperson says Shalala is "giving very careful consideration" to the steering panel's recommendation that the money be used for research. Her decision will be announced early next year.

–Eliot Marshall