

Birth order and intelligence

The notion that a child's intelligence is related to family size and order of birth is not new to behavioral scientists. Francis Galton, the founder of eugenics, spoke of the preeminence of the first-born, and learning theorists since Edward Thorndike have been interested in the importance of family configuration in intellectual development. For the past several years the most popular theorist has been University of Michigan psychologist Robert B. Zajonc, whose so-called "confluence model" explains the lower intelligence of later-born children as a function of the average intellectual environment of the family. According to Zajonc's theory, as a family grows the intellectual environment diminishes, so that depending on the spacing of the children, the later-born siblings are raised in a less stimulating world.

New data now challenge the confluence theory and the connection between family size and intelligence. Brigham Young University psychologist Richard C. Galbraith, in an article to be published in the March *DEVELOPMENTAL PSYCHOLOGY*, reports intelligence and family data on almost 11,000 BYU students. He concludes that family size has a neutral or slightly positive effect on intelligence. And child spacing, he adds, is unhelpful in explaining differences in intelligence among siblings.

More important from a theoretical point of view, Galbraith says, is that the confluence model does not work. Based as it is on large national data sets rather than actual sibling data, he argues, the model fails to handle individual differences in intelligence among siblings, requiring unrealistic child spacing to account for cases where younger siblings are more intelligent. The model has endured since 1975 without serious question only because it suited the *zeitgeist* supporting the popular preference for smaller families, he told *SCIENCE NEWS*.

Brandeis psychologist Michael L. Berbaum, Zajonc and University of Michigan psychologist Gregory B. Markus, in a rebuttal to Galbraith, argue that he has taken a static view of intelligence, which the confluence theory does not share. Furthermore, they add, the predominantly Mormon population that Galbraith has studied is characterized by large and especially nurturant families and therefore might not comply as well with the predictions of their mathematical model.

Transplants for the aging brain

A few years ago, the first successful transplants of tissue into the brains of rats raised hopes for the cure of such disorders as Parkinsonism, which is caused by a known brain lesion. But it was known that only fetal tissue could survive transplant, and it was assumed by most that neurons could only be successfully transplanted into very young rats. That assumption was wrong, according to University of Rochester anatomist Don Marshall Gash, who has successfully transplanted brain cells into aged rats. Although the transplants did not lead to behavioral changes in the 25-month-old rats, the new tissue did integrate itself into the recipient brain and develop its own blood supply. "We tend to think of the aged brain as static or deteriorating," says Gash, "and there were questions about whether or not an aged brain could provide vascular support for a transplant. We've found age is not a barrier. I think the aged brain is far more flexible than we give it credit for."

Gash's success is especially interesting when coupled with findings reported in the March 5 *SCIENCE* by neurologist Peter J. Whitehouse and his colleagues at Johns Hopkins University. Whitehouse reported data showing degeneration of a specific group of neurons in patients suffering from Alzheimer's disease, a major brain disorder affecting the elderly. The neurons are found in the basal forebrain, a major source of chemical arousal for the cerebral cortex.

A forum for defense research issues

Technology export control is one of three issues on the agenda of a new joint committee formed by the Association of American Universities and the Department of Defense. Composed of eight university presidents and eight defense department representatives, the forum is cochaired by Stanford University President Donald Kennedy and Defense Under Secretary for Research and Engineering Richard D. DeLauer. At the forum's first meeting on Feb. 24, the participants agreed to establish a joint working group to discuss export controls in more detail and provide guidance for the forum's next meeting in the fall.

DeLauer also called for the establishment of working groups on science and engineering education, and language and international studies. He is concerned that the nation's schools are not educating the number and quality of engineers, scientists and other personnel the country needs. The purpose of the working groups is to "define the problems in these areas and suggest some approaches both for discussion and consideration by the Defense Department and university community," says John C. Crowley of the Association of American Universities.

The export control group will work closely with the National Academy of Sciences, which is doing a similar study (*SN*: 3/20/82, p. 204). "I hope that the working group will contribute to the work of the Academy and that the Academy's interim report, which they hope will be available in September, will be considered by the forum working group and by the forum itself," says Crowley. The meetings will be closed "to encourage candid discussion." Universities represented on the forum are: Stanford, Rutgers, Minnesota, California, Columbia, Rochester and the California and Georgia Institutes of Technology.

As the rules change at the EPA

The rules keep changing as the Environmental Protection Agency, amid considerable controversy, strives to balance industrial needs and environmental concerns.

- On March 12, the EPA proposed national guidelines for cleaning up the worst abandoned hazardous waste sites. The "National Contingency Plan" determines whether the federal government can use the \$1.6-billion Superfund, the cleanup priority of hazardous substance spills or waste sites and the extent of cleanup required. It provides for a flexible case-by-case approach in tailoring cleanup plans to conditions at individual sites.

While the chemical industry praised the proposed guidelines, critics claimed the plan concentrated on administrative procedures for dealing with waste dumps rather than setting specific cleanup methods and standards. The public has 30 days to respond to the proposals, after which the EPA will consider the comments and then publish a final plan.

- On March 17, the EPA decided that no container holding visible, free-standing liquid may be placed in a landfill. Originally, the EPA banned the disposal of any liquids in landfills from Nov. 19, 1981, to Feb. 25, when it lifted the ban for three months until it developed new standards (*SN*: 3/6/82, p. 150). However, protests at a recent public hearing forced a reversal in policy. Under the interim rule, landfill operators must open and inspect waste containers for free-standing liquids, removing or solidifying those discovered.

- Last month, the EPA extended the deadline for a requirement that generators of hazardous waste and operators of disposal facilities submit annual reports on their activities to the government, because the EPA is developing proposals to streamline or eliminate this requirement. The EPA believes it can meet its annual data needs through surveying small samples of the firms involved instead of requiring annual reports.