The Face of Autism

It's long been known that people with autism show little interest in, and are bad at recognizing, other people's faces. Now researchers have shown that the brains of very young children with autism react more strongly to seeing a familiar toy than to seeing their mothers.

The study "highlights that autism is a disorder of the social brain," says psychologist Geraldine Dawson of the University of Washington, Seattle, who reported the findings at the meeting of the Society for Research in Child Development last month in Minneapolis.

The researchers took brain wave recordings of three groups of 3- and 4-year-olds: one group with autism, one group retarded, and a control group with typical development. Each child was shown a picture of their mother paired with the face of a stranger, as well as a picture of a favorite toy paired with a strange toy. Whereas both the normal and the retarded children showed distinctly different brain reactions to the mother/stranger pictures, there was no differential reaction among the autistic children. They had normal responses, however, to the toy pictures.

The results are consistent with the fact that when autistic people do look at others' faces, they are likely to look at only parts of it, focusing on the mouth, rather than looking into the eyes—evidence that they are using object-processing functions for face processing, says child development researcher Charles Nelson of the University of Minnesota, Twin Cities.

Dawson believes autistic children fail to develop the brain's face-recognition area—the fusiform gyrus—because of an "abnormality in assigning reward value to social stimuli." Robert Schultz of Yale University, author of a brain imaging study last year showing that autistic adults have less activation in the fusiform gyrus in response to face pictures, agrees with Dawson that it's likely that the problem lies in a deeper layer of the brain.

Dawson says intensive early interventions can bring out social tendencies in some autistic children; she hopes with this group "to see if those who respond [to the intervention] will show change in the ability to recognize faces."

Conservation Conundrum

"What is the heart of conservatism if it does not include leadership in conservation? And why have conservative thinkers needlessly, and against all logic and their own self-interest, surrendered the moral high ground on this issue to the liberals?"

—Harvard biologist E. O. Wilson, who says he is "nonpolitical," in a talk on species extinction last month at the American Enterprise Institute, a prominent conservative think tank in Washington, D.C.

Number Fun With Ben

Benjamin Franklin is well known for such practical inventions as bifocals and the lightning rod. Often overlooked are his purely mathematical creations, including one that's only recently been discovered.

The ever-busy Franklin spent idle time concocting "magic" squares and circles: geometric arrangements of numbers with many ways of getting the same sum. He once told a friend he could fill in the numbers "as fast as I could write them." But he published just three examples, two squares and a circle, which have long been in the mathematical literature.

17	47	30	36	21	43	26	40
32	34	19	45	28	38	23	41
33	31	46	20	37	27	42	24
48	18	35	29	44	22	39	25
49	15	62	4	53	11	58	8
64	2	51	13	60	6	55	9
1	63	14	52	5	59	10	56
16	50	3	61	12	54	7	57

Not only do the numbers in each row and column add up to 260, but so do the numbers in each of the color-coded "bent columns." The color coding can be slid left or right, and the same magic occurs.

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Now Paul Pasles, a number theorist at Villanova University in Philadelphia, has brought to light four more. He found three squares, with 4, 6, and 8 numbers to a side, in the 35-volume *Papers of Benjamin Franklin*, which began publication in 1959. And he uncovered a 16 x 16 monster in the library of the Royal Society in London, in a facsimile of a letter Franklin wrote in 1765. "They didn't know they had it!" he says. It will appear for the first time in the June/July issue of the *American Mathematical Monthly*.

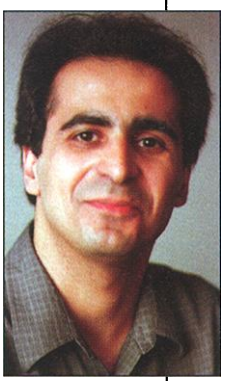
The expanded oeuvre shows that Franklin "had at least four different methods" for constructing magic squares, Pasles says. Roughly speaking, there are three mathematical challenges: inventing algorithms to generate the squares; classifying them (there are, for example, 880 possible 4 x 4 squares); and inventing squares with extra magic properties, such as "bent" rows and columns with the same sum (see illustration).

Could there be other squares still buried in Franklin's papers? "No comment," says Pasles. "If there are, I want to be the one to find them."

Japan, Waterman Awards Announced

Two major scientific prizes were announced last week, one for lifetime achievement, one for great precocity, and both related to wireless information technology.

The $420,000 Japan Prize is being awarded this year to John B. Goodenough of the University of Texas, Austin, for the discovery of materials that have been critical to the development of environmentally benign rechargeable batteries for portable or mobile instruments. Goodenough, 78, developed the lithium battery as a substitute for those that use polluting lead or cadmium.



Vahid Tarokh.

Also in the money is Vahid Tarokh, a 34-year-old computer science and engineering professor at the Massachusetts Institute of Technology, who gets the National Science Foundation's annual Waterman Award, its highest honor for fledgling scientists and engineers. Tarokh, formerly at AT&T Labs, will receive $500,000 over 3 years as the main inventor of "space time coding," a technique that improves the speed and reliability of data transmission on wireless devices such as cell phones and laptops.