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A Researcher's Puzzles Point to the Differences in the Autistic Brain

By David Wolman 02.25.08 | 6:00 PM

FEATURE

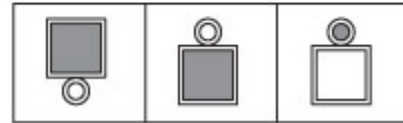
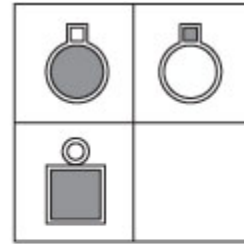
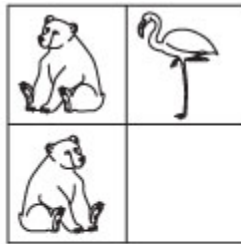
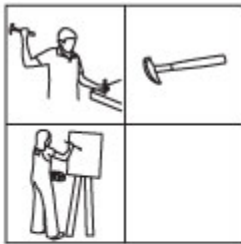


[The Truth About Autism: Scientists Reconsider What They Think They Know](#)

Over the years, scientists have tended to look for neurological abnormalities in autistics — brain size, a lack of certain neurons, differences in connectivity between brain regions, and lesser activation in areas responsible for language. "It's not hard to look at an autistic brain and find differences," says Mike Merzenich, a professor of

neuroscience at UC San Francisco. But now some scientists are setting aside the assumption that autistic brains are defective and instead focusing on how the autistic brain is different.

There is, for example, plenty of evidence that autistics think in pictures. Cherif Sahyoun of MIT is looking for differing neurobiology in the brains of autistics using fMRI, diffusion tensor imaging (which measures the density of brain wiring), and a collection of puzzles that Sahyoun has spent nearly three years developing. Consider the following:



Solving the puzzle on the left requires language—about carpentry, tools, and painting; scientists refer to these as conceptual relationships. To complete the puzzle on the right, only visuospatial processing is needed, because the meaning of the items pictured has no bearing on the solution. But the middle puzzle is a hybrid. The brain may draw on information about bears and flamingos to solve the puzzle and say: "I see two bears, one facing left and one facing right, so I need my second flamingo to face right." But the brain may also discount all thoughts of bears and flamingos, resorting instead to consider just shape and symmetry to find the answer.

Sahyoun's hypothesis is that autistic people's brains will demonstrate a bias for visuospatial processing when solving the middle puzzle, whereas non-autistics will lean more heavily on parts of the brain that process information about language and meaning. If he's right, this difference should show up in brain scans. By avoiding questions about strengths versus weaknesses, Sahyoun hopes to show that different strategies for reasoning arise from different brain structures.