WHEN TWO MINDS THINK ALIKE

A powerful new idea may give us valuable insights into the cause of autism and the very essence of human nature.

By Simon Baron-Cohen

Over the years I've been struck by a pattern among the parents of children with autism. The mothers often say things like "my child is a lot like my husband—just writ large. My husband has to watch the weather forecasts every night, and my son has to watch them every hour." When I ask about their parents, the mothers comment, "Well, my father was rather similar to my husband—he collected model trains and knew everything there was to know about each one."

Such observations don't amount to evidence about the cause of autism, but they do give us clues about where to look. Autism is at root genetic, but new research from my lab at Cambridge University implicates genes inherited from both parents. From this and other observations, we've formulated the "assortative mating theory." Its central idea is that both mothers and fathers of children with autism (or its milder variant, Asperger Syndrome) share a common characteristic and have been attracted to each other because of their psychological similarity.

Assortative mating is a term borrowed from the field of genetics that refers to a long-recognized aspect of animal behavior: the simple idea that mate selection is not random. Animals, including human animals, do not mate with just anyone.

Darwin theorized that two kinds of selection operate to ensure that some animals have better reproductive success than others: natural selection and sexual selection. Deer with large antlers, for example, are more likely to reproduce—not just because they can defeat weaker males in contests over females (natural selection), but also because the females themselves tend to prefer males with the largest antlers (sexual selection). Animals are finely tuned to external indicators of fitness, and these indicators influence whether or not they will mate with a potential partner.

Assortative mating goes one step further by noting that two animals of the same species often end

IDEAS FROM THE EDGE

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up mating when they have a common or similar trait. A clear example in humans is that taller men tend, on average, to have female partners who are also above average in height. Unconsciously, we seem to select partners who are similar to ourselves in at least one respect. Other studies in humans have shown assortative mating for physical characteristics as subtle as eye color and for psychological characteristics such as personality.

So what has all of this got to do with autism? We know that autism runs in families, and that if a child with autism is a twin, the chances of the other twin also having autism is much higher if the twins are identical. This tells us that genes are likely to be an important part of the explanation, and that one should look at the parents of children with autism for clues. Furthermore, our studies have uncovered four findings that implicate assortative mating in autism. First, both parents of children with autism are likely to be super-fast on attention tasks, in which the aim is to spot a detail as quickly as possible. Second, both parents have an increased likelihood of having had a father who worked in the field of engineering. Third, both parents are more likely to have elevated scores on subtle measures of autistic traits. And fourth, both parents show a trend toward a more male pattern of brain activity when measured using MRI.

The chances of both parents displaying these similarities are vanishingly small. Something must be causing two such individuals to be attracted to one another. I propose that "something" is strong systemizing—the drive to analyze the details of a system in order to understand how it works.

All human brains have a systemizing mechanism that is set at different levels. The extreme behavior of children with autism (whose systemizing mechanism may be set too high) may seem like a far cry from the more moderate behavior seen in their parents and grandparents, but this new theory proposes that across the generations these are only differences of degree. Think of a child with autism, who appears lost in his or her own world, totally focused on lining up Lego bricks into colorful patterns for hours at a time. This is hypersystemizing. Then think of the parents we talked about at the outset: a fascination with weather reports is one example of systemizing, a fascination with model trains is another, albeit milder, example.

Evidence from parents in the general population suggests there is assortative mating for systemizing, such that people who are attracted to systems are more likely to have a partner who shares this characteristic. Combined with the fact that both parents of children with autism are likely to be very detail-oriented, highly analytic, and to have a father who worked in a field requiring good systemizing skills, this suggests that the genes involved in systemizing may be linked to the genes that cause autism.

Although these genes remain to be identified, the assortative mating theory throws up some testable predictions. First, autism should be more common in families where both parents are strong systemizers. For example, some media reports have claimed that autism is more prevalent in areas like Silicon Valley, but we need well-controlled tests to see if this is true. Second, since the drive to systemize is stronger in males than in females, it should be the case that both mothers and fathers of children with autism are more likely to have strongly "male" interests and behaviors. Finally, if systemizing is linked in part to prenatal testosterone levels (which studies from our lab suggest may be the case), then mothers of children with autism may be more likely to have testosterone-linked medical conditions. Again, a highly testable prediction.

Could the apparent rise in the prevalence of autism in part be the result of assortative mating of two strong systemizers?

Autism has skyrocketed from a rare condition of only four in 10,000 children in the 1970s to an astonishing 1 percent of children today. This massive change undoubtedly reflects improved recognition of the condition and consequent growth in services. In addition, even the way in which we conceptualize autism has changed, from being a discrete category in the 1970s—you either had autism or you did not—to a spectrum condition that acknowledges degrees of autism. Therefore, the boundary between those who have the diagnosis and those who do not is a fuzzy one, leaving room for clinical interpretation.

But could the apparent rise in the prevalence of autism also in part be the result of assortative mating of two strong systemizers? Is it possible that over and above the effects that social and clinical factors have had, assortative mating of two strong systemizers has become more frequent?

Consider that in the late 1950s, less than 2 percent of undergraduates at MIT (a university that caters to people with good systemizing skills) were women. Today female enrollment has jumped to 50 percent. This microcosm is just one example of how society has changed in ways that would bring strong systemizers into greater proximity. Over the same period, air travel has also meant far greater opportunities for people from widely differing backgrounds to meet, possibly brought together by their common interest in systems. Finally, over this same timeframe, individuals who are systemizers have enjoyed new employment opportunities as the result of the digital revolution. Where 50 years ago a strong systemizer might have found a job as an accountant, today every workplace needs computer-savvy employees, and the financial rewards for good systemizing skills can be immense.

The contribution of assortative mating to the changing prevalence rate of autism is difficult to study. It is also controversial: the idea that a child with autism is the result of the unique mixing of genes from parents who share a common feature sits uncomfortably with those who want to believe the cause of autism is purely environmental. But I believe the preliminary evidence in support of the theory warrants further research. We stand to gain valuable insight into the cause of autism, and given the links between autism and the capacity to systemize, a trait that has helped humans to dominate the planet, we stand to gain a better understanding of human nature.

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