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Mind And Matter: Is an Economist Qualified To Solve Puzzle of Autism?; Professor's Hypothesis: Rainy Days and TV May Trigger Condition

Mark Whitehouse. **Wall Street Journal**. (Eastern edition). New York, N.Y.: Feb 27, 2007. pg. A.1

In the spring of 2005, Cornell University economist Michael Waldman noticed a strange correlation in Washington, Oregon and California. The more it rained or snowed, the more likely children were to be diagnosed with autism.

To most people, the observation would have been little more than a riddle. But it soon led Prof. Waldman to conclude that something children do more during rain or snow -- perhaps watching television -- must influence autism. Last October, Cornell announced the resulting paper in a news release headlined, "Early childhood TV viewing may trigger autism, data analysis suggests."

Prof. Waldman's willingness to hazard an opinion on a delicate matter of science reflects the growing ambition of economists -- and also their growing hubris, in the view of critics. Academic economists are increasingly venturing beyond their traditional stomping ground, a wanderlust that has produced some powerful results but also has raised concerns about whether they're sometimes going too far.

Ami Klin, director of the autism program at the Yale Child Study Center, says Prof. Waldman needlessly wounded families by advertising an unpublished paper that lacks support from clinical studies of actual children. "Whenever there is a fad in autism, what people unfortunately fail to see is how parents suffer," says Dr. Klin. "The moment you start to use economics to study the cause of autism, I think you've crossed a boundary."

Prof. Waldman, who thinks television restriction may have helped rescue his own son from autism, says many noneconomists don't understand the methods he used. His paper recommends that parents keep young children away from television until more rigorous studies can be done. "I've gotten a lot of nasty emails," he says. "But if people aren't following up on this, it's a crime."

Such debates are likely to grow as economists delve into issues in education, politics, history and even epidemiology. Prof. Waldman's use of precipitation illustrates one of the tools that has emboldened them: the instrumental variable, a statistical method that, by introducing some random or natural influence, helps economists sort out questions of cause and effect. Using the technique, they can create "natural experiments" that seek to approximate the rigor of randomized trials -- the traditional gold standard of medical research.

Instrumental variables have helped prominent researchers shed light on sensitive topics. Joshua Angrist of the Massachusetts Institute of Technology has studied the cost of war, the University of Chicago's Steven Levitt has examined the effect of adding police on crime, and Harvard's Caroline Hoxby has studied school performance. Their work has played an important role in public-policy debates.

But as enthusiasm for the approach has grown, so too have questions. One concern: When economists use one variable as a proxy for another -- rainfall patterns instead of TV viewing, for example -- it's not always clear what the results actually measure. Also, the experiments on their own offer little insight into why one thing affects another.

"There's a saying that ignorance is bliss," says James Heckman, an economics professor at the University of Chicago who won a Nobel Prize in 2000 for his work on statistical methods. "I think that characterizes a lot of the enthusiasm for these instruments." Says MIT economist Jerry Hausman, "If your instruments aren't perfect, you could go seriously wrong."

By suggesting that something within parents' control could be triggering autism, Prof. Waldman has reopened old wounds in the realm of autism research, which is littered with debunked theories linking the disorder to the family environment.

"This is junk science," says Alison Singer, parent of an autistic child and senior vice president of Autism Speaks, a nonprofit founded by former NBC Universal Chief Executive Bob Wright. "Autism is a genetic disorder. The only thing the parents do wrong is they have bad genes."

The term "autism" describes a spectrum of diagnoses with symptoms that may include impaired language skills, difficulty understanding social cues, and an obsession with routine or repetitive actions. The Centers for Disease Control and Prevention estimate that as many as one in 150 children in certain parts of the U.S. have some form of autism.

Studies in recent decades have shown the proportion of children with autism growing, though researchers aren't sure the disorder has actually become more prevalent. Greater awareness, broadening definitions of the disorder and the availability of special-education programs may have made parents more likely to get their children diagnosed.

Over the years, attempts to understand the affliction have been tough on parents. One of the earliest, the "refrigerator mother" theory, blamed autism on a lack of maternal affection. Popularized by celebrity psychologist Bruno Bettelheim, the theory survived from the 1940s until the late 1960s, virtually demonizing mothers of autistic children until more-careful studies failed to support the idea. More recently, a scare about measles vaccinations stirred anxiety, but large studies have shown no link to autism.

Most researchers now recognize that heredity plays a central role in autism, and they are making progress in identifying the genes responsible. They're also looking into the possibility of interaction with environmental factors, both in the womb and after birth.

Some experts think that in reaction to the discredited theories the pendulum has swung too far away from the family. "The discussion of the role of the family, and social interaction within the family, is virtually taboo," says Anna Baumgaertel, a developmental-behavioral pediatrician at the Children's Hospital of Philadelphia. She says some of her autistic patients have been heavy video and TV watchers since birth -- a factor she thinks "may lead to autistic behavior in susceptible children, because it interferes with the development of 'live' auditory, visual, and social experience."

Prof. Waldman, a recognized expert in the field of applied microeconomics, doesn't pretend to be an authority on autism. He became engrossed in the subject in the fall of 2003, when his 2-year- old son, David, was identified as having an autism-spectrum disorder. Hoping to eliminate any potential triggers, Prof. Waldman supplemented the recommended therapy with a sharp reduction in television watching. His son had started watching more TV in the summer before the diagnosis, after a baby sister was born.

Prof. Waldman says his son improved within six months and today has fully recovered -- a surprising result, given that autism is typically a lifetime affliction. "When I saw the rapid progress, which was certainly not what anyone had been predicting, I became very curious as to whether television watching might have played a role in the onset of the disorder," he says. He tried to get medical researchers interested in the idea, to no avail.

In late 2004, he decided to look into the subject himself, ultimately putting together a research team with Cornell health economist Sean Nicholson and Nodir Adilov, a professor of economics at Indiana University-Purdue University in Fort Wayne.

In principle, the best way to figure out whether television triggers autism would be to do what medical researchers do: randomly select a group of susceptible babies at birth to refrain from television, then

compare their autism rate to a similar control group that watched normal amounts of TV. If the abstaining group proved less likely to develop autism, that would point to TV as a culprit.

Economists usually have neither the money nor the access to children needed to perform that kind of experiment. More broadly, randomized trials seldom lend themselves to studying economic questions, particularly the more traditional ones. It would be unfair to randomly subject some people to a higher tax rate just to see how it affects their spending.

Instead, economists look for instruments -- natural forces or government policies that do the random selection for them. First developed in the 1920s, the technique helps them separate cause and effect. Establishing whether A causes B can be difficult, because often it could go either way. If television watching were shown to be unusually prevalent among autistic children, it could mean either that television makes them autistic or that something about being autistic makes them more interested in TV.

The ideal instrument is a variable that is correlated with A but has no direct effect of its own on B. It should also have no connection to other factors that might cause B. If data in a study nonetheless show that the instrumental variable is linked to B, it suggests that A must be contributing to B.

Take a question Prof. Angrist of MIT sought to answer: Did service during the Vietnam War have a negative effect on people's future earnings? It wouldn't be enough to say that people who served ended up poorer. Perhaps a lack of opportunities in the civilian world made them more likely to enlist in the first place.

As an instrumental variable, Prof. Angrist chose the draft lottery, which made some people more likely than others to serve in the Vietnam-era military, but didn't have any connection to their initial circumstances. On average, white men whose low lottery numbers made them draft-eligible had much lower earnings many years later. (The data on nonwhites were inconclusive.) In a seminal 1990 paper, Prof. Angrist concluded that conscription had a detrimental effect on future earnings.

"Economic research is becoming more empirical and in some ways more like clinical research in medicine," says Prof. Angrist. "I think it's a wonderful thing. It's a sign of the extent to which economics has become more of a science and less of an exercise in formal abstraction like philosophy or mathematics."

Chicago's Prof. Levitt tackled police staffing and crime. That's an issue where cause and effect are hard to disentangle because cities with many criminals are likely to have more police, but that doesn't mean an excess of officers causes crime. Prof. Levitt took advantage of the fact that mayors and governors tend to put more police on the streets in election years. Using election cycles, he concluded in a 1997 paper that adding police reduces violent crime.

Prof. Waldman and his colleagues had such studies in mind when they approached autism and TV. By putting together weather data and government time-use studies, they found that children tended to spend more time in front of the television when it rained or snowed. Precipitation became the group's instrumental variable, because it randomly selected some children to watch more TV than others.

The researchers looked at detailed precipitation and autism data from Washington, Oregon and California -- states where rain and snowfall tend to vary a lot. They found that children who grew up during periods of unusually high precipitation proved more likely to be diagnosed with autism. A second instrument for TV-watching, the percentage of households that subscribe to cable, produced a similar result. Prof. Waldman's group concluded that TV-watching could be a cause of autism.

Criticism quickly arose, illustrating some of the perils of the economists' approach. For one, instruments are often too blunt. As Prof. Waldman concedes, precipitation could be linked to a lot of factors other than TV-watching -- such as household mold -- that could be imagined to trigger autism.

At best, his data reflect the effect of television on those children who changed their habits because of rain or snow, not on those who did it for other reasons such as a desire to watch educational shows.

"It is just too much of a stretch to tie this to television- watching," says Joseph Piven, director of the Neurodevelopmental Disorders Research Center at the University of North Carolina. "Why not tie it to carrying umbrellas?"

Also, Prof. Waldman's findings do nothing to explain the mechanism by which television would influence autism, a gap that instrumental variables are inherently unable to fill. That's one reason many autism researchers think he shouldn't have publicized his results or made recommendations to parents. "I think this is irresponsible," says Dr. Klin of Yale. "We should not provide clinical advice unless there is scientific evidence to substantiate it."

To those who wonder about the autistic children who never watched TV or who had clear problems before they started watching, Prof. Waldman responds that his hypothesis isn't meant to be all-inclusive. "Even if we are correct, there are likely other triggers and possibly some children become autistic even in the absence of any trigger," he says.

David Card, a professor at the University of California, Berkeley, who has done influential work on the minimum wage, fears that the fascination with the instrumental-variables technique "leads to interest in topics that economists are not particularly well-trained to study."

Those who favor the method say it's just one tool among many -- all of which have flaws -- and is intended to help fill in the picture. Prof. Angrist, for example, readily acknowledges his Vietnam study applies only to those whom the draft forced to serve in the military, not to those who signed up voluntarily, and needs to be looked at in tandem with other work on the economic effects of military service.

Harvard economist Jeffrey Miron has started a project to test Prof. Waldman's methods and results. Prof. Waldman welcomes the scrutiny, saying he hopes his work will also provoke autism researchers to conduct clinical trials.

"Obviously this is an unusual thing for an economist to be looking at," says Prof. Waldman. "Maybe I was overconfident. We'll see."

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