THE WALL STREET JOURNAL.

https://www.wsj.com/articles/genetics-will-revolutionize-social-science-11580169106

OPINION | COMMENTARY

Genetics Will Revolutionize Social Science

Knowledge of which DNA strand does what will make it easier to judge which policies are effective.

By *Charles Murray*
Jan. 27, 2020 6:51 pm ET

PHOTO: PHIL FOSTER

Almost all human traits are partly heritable. That's been known for decades. But until a few years ago, no one knew what specific bits of DNA code determine any given trait. Now, however, geneticists have identified at least a few hundred variants in the DNA code that are statistically associated with important traits such as intelligence, depression and risk tolerance. Over the next decade, they are on track to identify

thousands of variants associated with dozens of traits. That achievement will open up the ability to score genetic potential on those traits and thereby revolutionize the social sciences.

The methods of scoring are improving almost monthly, but the essence is simple. Each variant has a version (more precisely, one of the alleles in a single nucleotide polymorphism) associated with a small boost to the trait in question. If you add up those small boosts, you have a score for that trait, in the same sense that you have an IQ score if you add up all the correct answers to the questions on an IQ test. In the case of DNA variants, it is called a "polygenic score."

Polygenic scores are revolutionary because they are causal in only one direction. They don't drop because tests make you nervous or rise because you grew up rich. They're impervious to racism and other forms of prejudice. Socioeconomic and cultural environments can play an important role in how those bits of DNA are *expressed,* but they don't change the codes themselves. That means polygenic scores will offer social scientists something they've never had before: a secure place to stand in assessing what is innate and what is added by the environment.

Progress during the past five years has been rapid for many traits. In the case of IQ, the share of the variation in scores that can be explained from genetic material alone went from zero in 2015 to 5% in 2018 and 11% in 2019. That doesn't tell us much about any individual's IQ, but it's enough to be useful in addressing many important issues.

To illustrate, consider this fraught question that bears on public policy: What are the effects of socioeconomic disadvantage on IQ? Answers have been frustratingly uncertain. Measures of IQ in early childhood are not only unreliable but already contaminated by environmental effects before birth and during infancy. Polygenic scores for IQ are free of that contamination. They can then be compared with actual IQ scores.

Suppose that, a few years from now, it has been solidly established that adolescents from disadvantaged backgrounds have IQ scores that average 10 points lower than their genetic potential would have led us to expect. Confident new knowledge of that kind will energize the search for effective childhood interventions in ways we can scarcely imagine.

Suppose instead it is found that the adolescent IQ scores of children from disadvantaged backgrounds are about the same as we'd expect from their polygenic scores. That will provide an incentive to foster human flourishing for people with lesser abilities—an issue that has been criminally ignored in our era's insistence that all the children can be above average.

I expect that the results will be somewhere in between. They will nonetheless teach us much about untapped potential that we don't know now. More broadly, we will be able to demystify the role of the environment. As matters stand, many social scientists believe that the environment interacts in endlessly complicated ways with genes. Is that true?

When the environment is a pervasive and complex force, the comparisons of polygenic scores and actual behavior will reveal that complexity and be a rich source of information for future research. But it's also possible—at least for some traits in some populations in some situations—that the role of the environment is neither complicated nor significant. That too would be an important finding.

I don't expect such analyses will be free of controversy. I am asserting that they are technically feasible, will be conducted within a few years, and will offer powerful tests of questions that have been argued for decades.

I have presented an optimistic view of the coming genomic revolution. Some prominent scholars adamantly disagree. They argue that science is about understanding causal pathways. Complex social behaviors such as marriage and divorce are known to be partly heritable but they do not have a specific genetic etiology. In the words of one of the leading pessimists, psychologist Eric Turkheimer, causal explanations are not going to be found in individual bits of DNA "any more than explanations of plate tectonics can be found in the chemical composition of individual rocks."

That is certainly true now and may remain so indefinitely. But social science has never been about causal pathways at the molecular level. Rather, it has been about explaining enough variation to achieve predictive validity. It's a common situation, even in the

hard sciences. The landmark discoveries of Galileo, Newton, Faraday and Maxwell were validated solely by their predictive validity. Predictive validity is what polygenic scores will give us.

We're not there yet. I think the application of genomic data to social science questions is roughly where aviation was in 1908. The world's best plane, the Wright Flyer, was little more than a toy. Yet within a decade, thousands of acrobatically maneuverable aircraft were flying high and fast over the battlefields of Europe.

The history of science allows one more prediction. When a scientific discipline gets a major new tool—such as the microscope or spectrometer—its eventual uses sprawl far beyond its original ones. Polygenic scores will be a similarly multipurpose tool, with open-ended potential for finding answers to questions today's social scientists can't even imagine.

Mr. Murray is a scholar at the American Enterprise Institute and author of the new book "Human Diversity: The Biology of Gender, Race and Class," from which this article is adapted.