

Q&A

# Lessons from ‘neurolaw’ for autism research

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Should neuroscientific evidence influence courtroom decisions? Inform public policy? Should insurance companies have access to a client’s autism diagnosis or any other mental condition? How should adolescents who run into trouble with the law be treated? ‘Neurolaw’ is a growing field of interdisciplinary research tackling these tough questions at the heart of science and society.

**Francis X. Shen** is executive director of the Center for Law, Brain and Behavior at Massachusetts General Hospital in Boston, where he investigates wide-ranging neurolegal questions with an interdisciplinary team of neuroscientists, lawyers and philosophers.

Shen says that scientists should include information about study **participants’ socioeconomic status** in their research because growing empirical evidence shows that poverty can severely affect brain development and function<sup>1</sup>. Specifically, he says studies should include metrics such as income, education and **race**.

Shen spoke to *Spectrum* about neurolaw and how it can bring neuroscientists and lawyers together to help shape society.

## ***Spectrum:* Why is neurolaw important?**

**Francis X. Shen:** It’s really captured in the motto of my lab: “Every story is a brain story.” Not only do I think that’s true, I think that recognizing that truth can help the legal system, both criminal and civil, do its job better. And that’s what motivates me: trying to find insights and approaches from neuroscience and related fields to better understand why people do the things they do, why sometimes they act in ways that we, and the legal system, wish they wouldn’t and, crucially, how — from a legal system perspective — we can help ourselves and those that come before the court to make better decisions and hopefully act in more pro-social ways.

**S: What are some of the major questions that neurolaw seeks to answer?**

**FS:** Right now, the diagnostic criteria of the **International Classification of Diseases** and the **Diagnostic and Statistical Manual of Mental Disorders** typically focus on measures of behavioral problems and not neurobiological markers. That is, you don't have a given condition until you are observed or self-report acting and behaving in certain ways, as defined by the diagnostic criteria. Where the research is headed in neuroscience, neurology and psychiatry is toward increased use of biological markers to inform detection, definition and response to mental health challenges. That is certainly the case for autism.

We are not there yet, but there are ways in which we are almost there. Some researchers are scanning the brains of infants at 6 months old and, based on that brain-scan data, making predictions about whether those infants will be later diagnosed with autism. But what and when do you tell parents about this predictive information? That is, do you simply provide all of the information and let parents decide what to do? Or do you set a threshold for when you will share the data? A challenge is that even though biomarkers might be able to predict outcomes much better than chance, what is the percentage at which clinicians should tell the parents about the findings? Is 87 percent likelihood good enough? What about 65 percent? And so on. These are challenging ethical and legal questions emerging from the neuroscience research.

**S: What other kinds of neurolegal questions might be relevant to autism?**

**FS:** Autism is one of those conditions that has relevance in many social and legal contexts. For instance, autism and the legal system encounter each other in special-education decisions for school-based services, questions on insurance coverage and adjudication of criminal cases in which the defendant has autism. Do stakeholders in the legal system have a sufficient understanding of autism? If they are holding on to outdated assumptions or mistaken information, we can change that.

**S: How can neuroscientists help shape society?**

**FS:** I often advise and teach students who aspire to be neuroscientists. Increasingly, I see in these students, and in the neuroscientists who mentor them, a desire to have their research make an impact not just in science but also beyond the lab. These scientists are doing incredibly important work, and it's great that more are now asking, "Is there a way that the work that I'm doing here — running mice through a little maze — could somehow change the world around me?" My answer to that question is, yes, absolutely.

Better understanding of cognitive function in health and disease can influence our political dialogue, social norms and legal standards. But to have an impact outside neuroscience requires engagement with society and with other disciplines on campus. For instance, I love it when neuroscientists come over to the law school to think about how their work is related to special-

education services, insurance coverage, criminal justice and much more. I think there are efforts underway to slowly but surely bring disciplines such as neuroscience and law together.

**S: You have said that researchers likely have an ethical duty to report demographic information about the socioeconomic status and race of their studies' participants — why?**

**FS:** I made the observation that if you flip open leading journals in social-science fields and you look at the tables of data, one of the tables in there will report the demographics of the participants. If you look at human neuroimaging studies, what you will find is that those demographics are almost never reported on their participants. Researchers rarely report summary statistics on the education, income and race of the participants in human neuroimaging.

The question is, is there an ethical duty and scientific justification to report that information? I think there is a strong case to be made that this data should be reported. If that information is not reported, then we don't know if mostly white people are being scanned, if mostly people with certain financial means are being scanned, if mostly people who come from families in which their parents went to college are being scanned. It is difficult to have a conversation about equity and diversity in neuroscience.

**S: What is the future of neurolaw?**

**FS:** The frustrating part is that right now the answers that law wants, neuroscience just can't provide. For instance, is this individual who is up for parole going to be violent next year? Neuroscience can't answer that question with 100 percent accuracy. But no one can, and neuroscience can help the legal system improve the accuracy of its best guesses. Is a certain treatment going to cure this individual of addiction? Again, neuroscience can't provide an answer. But neuroscience can help to reorient the conversation in terms of thinking about the average number of times someone will relapse as they face this chronic disorder of addiction. In doing so, we can better align the legal system's response and improve systemwide outcomes.

It's slow and difficult work to integrate neuroscience into law, especially when there aren't always clear answers from research. But we can do better than what we've got right now, and I think there are a lot of people inspired by the idea that better decisions, aligned with science, will produce better outcomes, aligned with justice.

**REFERENCES:**

1. Johnson S.B. *et al. Pediatrics* **137**, e20153075 (2016) [PubMed](#)