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# The Promise and Pitfalls of Neuroscience for Criminal Law and Procedure

Susan Bandes

*DePaul College of Law*

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# The Promise and Pitfalls of Neuroscience for Criminal Law and Procedure

## CONCLUSION

Susan A. Bandes\*

The explosion of knowledge in cognitive neuroscience over the past decade has been stunning. For the legal system, the prospect of a window into the brain has evoked strong reactions, ranging at the extremes from euphoria at the notion that we will no longer have to surmise what people are thinking or whether they are telling the truth,<sup>1</sup> to panic that law's bedrock assumptions—free will, responsibility, autonomy—will soon be upended.<sup>2</sup> On the spectrum between these extremes, cognitive neuroscience has raised a host of possibilities and concerns, has begun to play a role in the courts, and has given rise to a raft of interesting legal scholarship.

As Stephen Morse memorably cautioned, those who look to neuroscience to help resolve questions of criminal law need to guard against “Brain Overclaim Syndrome.”<sup>3</sup> Brain science can shed light on the eternal legal questions of responsibility and capacity, but it is unlikely to provide legally dispositive answers or render the questions superfluous. With that caveat firmly in mind, the potential uses of neuroscientific evidence for criminal law and procedure are nevertheless vast and exciting.

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\* Distinguished Research Professor of Law, DePaul University College of Law. Thank you to David Harris and the executive board of the American Association of Law Schools (AALS) Section on Criminal Justice for the opportunity to help organize the panel on criminal law and neuroscience at the 2009 Annual Meeting; to Alafair Burke, John Darley, Nita Farahany, and Andrew Taslitz for their superb contributions to the panel; and to Deborah Denno and Joshua Dressler for the opportunity to publish the symposium papers and for their exemplary editorial assistance.

<sup>1</sup> See, e.g., Margaret Talbot, *Duped: Can Brain Scans Uncover Lies?*, NEW YORKER, July 2, 2007, at 52 (discussing lie detection methods like the “No Lie MRI”); see also Susan A. Bandes, *Framing Wrongful Convictions*, 2008 UTAH L. REV. 5, 11.

<sup>2</sup> See Michael S. Pardo & Dennis Patterson, *Philosophical Foundations of Law and Neuroscience*, 2010 U. ILL. L. REV. 1211, 1212 (observing that “[s]ome believe that, in time, neuroscience will ‘dominate the entire legal system’”).

<sup>3</sup> Stephen J. Morse, *Brain Overclaim Syndrome and Criminal Responsibility: A Diagnostic Note*, 3 OHIO ST. J. CRIM. L. 397, 397 (2006) (“[T]he essential feature of [Brain Overclaim Syndrome] is to make claims about the implications of neuroscience for criminal responsibility that cannot be conceptually or empirically sustained.”).

Brain science has helped illuminate the dynamics of legal reasoning, calling into question the assumption that we reason from premises to conclusions,<sup>4</sup> investigating the conditions under which we remain open to counterarguments,<sup>5</sup> and exploring methods for correcting for biases and blind spots.<sup>6</sup> It has led to fascinating inquiries into the components of legal thought, such as the roles played by moral intuition, emotion, and utilitarian calculus.<sup>7</sup> These issues are at the heart of legal thought and practice generally, but much of the recent activity (experimentation, scholarship, and advocacy) has focused on their applicability to the criminal law.

Most prominently, neuroscience has weighed in on the nature of the basic requirements for criminal responsibility, including free will, voluntariness, mens rea, and mental competency.<sup>8</sup> On a more practical note, neuroscientific evidence has been invoked to help predict criminality, assess competence to stand trial or to waive essential rights, determine state of mind and voluntariness, measure maturity and capacity, diagnose psychopathy or legal insanity, and identify bias.

Sophisticated brain imaging techniques like functional magnetic resonance imaging (fMRI) raise another set of questions at the heart of law: questions about the legal system's ability to determine the truth—particularly about elusive questions of state of mind, memory, knowledge, and bias. Proponents of neuroimaging techniques such as “brain fingerprinting” claim that the brain can be plumbed for evidence of events the subject has witnessed, deeds the subject has committed, and lies the subject has told.<sup>9</sup> This set of questions gives rise to a subsidiary set: What is it about certain types of evidence that juries and other fact-finders find particularly persuasive?<sup>10</sup>

The neuroscience explosion highlights the importance of interdisciplinary approaches to the study of criminal law, encouraging criminal law scholarship's

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<sup>4</sup> See Jonathan Haidt, *The Emotional Dog and Its Rational Tail: A Social Intuitionist Approach to Moral Judgment*, 108 PSYCHOL. REV. 814, 817 (2001); Ziva Kunda, *The Case for Motivated Reasoning*, 108 PSYCHOL. BULL. 480, 482–83 (1990).

<sup>5</sup> See Haidt, *supra* note 4, at 828–29.

<sup>6</sup> See Susan A. Bandes, Response, *Emotions, Values, and the Construction of Risk*, 156 U. PA. L. REV. PENNUMBRA 421, 429–30 & nn.40–41 (2008), <http://www.pennumbra.com/responses/03-2008/Bandes.pdf>. Bias-correction may be useful not only for fact-finders like judges and jurors, but for legal experts, for investigators like police and prosecutors, and for other legal actors such as defense attorneys.

<sup>7</sup> See Kevin M. Carlsmith & John M. Darley, *Psychological Aspects of Retributive Justice*, 40 ADVANCES EXPERIMENTAL SOC. PSYCHOL. 193, 194 (2008); Joshua D. Greene et al., *An fMRI Investigation of Emotional Engagement in Moral Judgment*, 293 SCIENCE 2105, 2105–07 (2001).

<sup>8</sup> See Deborah W. Denno, *Crime and Consciousness: Science and Involuntary Acts*, 87 MINN. L. REV. 269, 271–75 (2002); Richard E. Redding, *The Brain-Disordered Defendant: Neuroscience and Legal Insanity in the Twenty-First Century*, 56 AM. U. L. REV. 51, 53–54 (2006).

<sup>9</sup> See, e.g., *Harrington v. State*, 659 N.W.2d 509, 516 n.6 (Iowa 2003) (considering the claim that brain testing would show that the defendant's alibi was truthful and that he was innocent of the crime charged); see also Talbot, *supra* note 1 (discussing the “No Lie MRI”).

<sup>10</sup> Julie A. Seaman, *Black Boxes*, 58 EMORY L.J. 427, 432–34 (2008).

move away from insularity. The articles in this volume illustrate the range of knowledge implicated in studying the cognitive aspects of criminal law.

One focus of the panel that gave rise to these articles was to explore the implications of neuroscience for the fundamental substantive criminal law questions that have thus far dominated the debate about criminal law and neuroscience. For example, what impact will our growing knowledge of the brain have on the legal system's efforts to separate the guilty from the innocent, the responsible from the incapacitated? What impact will it have on the system's ability to predict criminality, to assess punishment, or even to rehabilitate or "cure" criminals? And what are the pitfalls of this technology or at least of our efforts to mine it for answers to legal questions and solutions to legal problems?

A second goal of the panel was to bring criminal procedure more squarely into the conversation. Much of the focus of debate thus far has been on the truth value and admissibility of the evidence. There are some looming issues about how and when it can be obtained as well. Consider, for example, brain fingerprinting, which measures the subject's prior familiarity with particular images. The suspect who claims he has never seen the victim before can be confronted with her prior image in his brain.<sup>11</sup> Is the image a "thing" to be "seized" within the meaning of the Fourth Amendment, and if so, what does the Fourth Amendment say about seizure of such evidence? What does the Fifth Amendment say about whether such fingerprinting amounts to compelled testimony against oneself? Is brain imaging more like blood or other physical evidence that is unprotected by the Fifth Amendment, or is it more like verbal testimony, and thus entitled to Fifth Amendment protection?<sup>12</sup>

A final focus of the panel was on cognitive bias more generally. Neuroimaging has had tremendous impact on popular and academic attitudes toward the study of decision making. It has made it much more acceptable to acknowledge that legal actors are not always rational and that there is something to be gained by studying actual decisional dynamics. It is worth emphasizing that the study of decisional dynamics was vital even prior to the neuroscience explosion,<sup>13</sup> and that important work continues to be done on cognitive bias outside the realm of neuroimaging techniques.<sup>14</sup>

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<sup>11</sup> Or for that matter, the suspect may seek to use brain fingerprinting to confirm his own alibi and demonstrate his innocence. See sources cited *supra* note 9.

<sup>12</sup> For an excellent discussion of these issues, see Michael S. Pardo, *Neuroscience Evidence, Legal Culture, and Criminal Procedure*, 33 AM. J. CRIM. L. 301, 321–36 (2006).

<sup>13</sup> Some of the dynamics and phenomena that neuroscientists are exploring were already well established, but color pictures of the brain seem to impress people inordinately. See, e.g., JEROME KAGAN, *WHAT IS EMOTION?: HISTORY, MEASURES, AND MEANINGS* 26 (2007) (discussing the effect of color photographs of brain states on willingness to believe in the power of the abstract notion of "emotion"); see also Susan A. Bandes, *Repellent Crimes and Rational Deliberation: Emotion and the Death Penalty*, 33 VT. L. REV. 489, 509 n.111 (2009).

<sup>14</sup> See, e.g., *FEELING AND THINKING: THE ROLE OF AFFECT IN SOCIAL COGNITION* (Joseph P. Forgas ed., 2000); *HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT* (Thomas

For the uninitiated, the articles in this volume offer an accessible and invigorating introduction to the questions raised by neuroscience's foray into the criminal law. The accessibility of the articles does not, however, come at the expense of nuance. For readers more familiar with the issues, these articles offer a sophisticated interdisciplinary conversation about some of the most exciting challenges and opportunities currently facing the fields of criminal law and procedure.