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Book Review: "Law and the Brain"

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LAW AND THE BRAIN

Semir Zeki and Oliver Goodenough, eds.
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**Reviewed by
Stacey A. Tovino***

Edited by Semir Zeki and Oliver Goodenough, *Law and the Brain*¹ is a wonderful collection of fourteen essays that examine a range of topics at the intersection of law and neurobiology. Although neurotransdiscipline texts, collections, and journal symposia abound,² what makes *Law and the Brain* so special is its focus on the special challenges raised by the neuroscience-policy interface. These challenges flow from basic differences in the orientation of the brain and brain science, on the one hand, and the law on the other.³

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1. LAW AND THE BRAIN (S. Zeki & O. Goodenough eds., 2006).

2. See, e.g., SANDRA J. ACKERMAN, *HARD SCIENCE, HARD CHOICES: FACTS, ETHICS, AND POLICIES GUIDING BRAIN SCIENCE TODAY* (2006); MICHAEL S. GAZZANIGA, *THE ETHICAL BRAIN* (2005); *NEUROETHICS: DEFINING THE ISSUES IN THEORY, PRACTICE, AND POLICY* (Judy Illes ed., 2006); *NEUROETHICS: MAPPING THE FIELD* (Steven J. Marcus ed., 2002); *NEUROSCIENCE AND THE LAW: BRAIN, MIND, AND THE SCALES OF JUSTICE* (Brent Garland ed., 2004); DAI REES & STEVEN ROSE, *THE NEW BRAIN SCIENCES: PERILS AND PROSPECTS* (2004); STEVEN ROSE, *THE FUTURE OF THE BRAIN: THE PROMISE AND PERILS OF TOMORROW'S NEUROSCIENCE* (2005); LAURENCE TANCREDI, *HARDWIRED BEHAVIOR: WHAT NEUROSCIENCE REVEALS ABOUT MORALITY* (2005); Symposium, *Neuroethics*, 32 J. MED. ETHICS 63 (2006); Symposium, *Neuroethics*, 5 AM. J. BIOETHICS 1 (2005); Symposium, *Neuroethics*, 50 BRAIN & COGNITION 341 (2002).

3. Semir Zeki & Oliver R. Goodenough, *Introduction*, in LAW AND THE BRAIN, *supra* note 1, at xiv.

We learn that individuals' brains are highly variable, as are their cognitive and emotional aptitudes and potentials.⁴ Then we are reminded that the law does not allow unchecked expression of that variability.⁵ We see that human equality is a scientific myth, but then we recall that the myth of equality is an important element in the maintenance of social order.⁶ We are told that science advances by holding questions open, entertaining a number of possible hypotheses, and recognizing the contingent nature of scientific truth.⁷ Then we remember that the law requires quick answers based on limited information.⁸ In their short introduction, Zeki and Goodenough show how the scientific virtue of uncertainty runs counter to the certainty required for legal decision making.⁹ In concluding that better science, not less science, is the antidote to the ignorant use of bad science, the editors set the stage for the remaining essays.¹⁰

The first two essays, Judge Morris Hoffman's *The Neuroeconomic Path of the Law* and Erin O'Hara's *How Neuroscience Might Advance the Law*, situate within jurisprudence and the legal academy the relationship between law and the brain. Hoffman suggests that advances in our understanding of the brain presage similar changes in our understanding of the roots of the law, its "adaptive value and its role as an institutional expression of evolved social behaviours."¹¹ In keeping with the editors' themes of certainty and variability, Hoffman suspects that our deepest social instincts, such as altruism, operate like deep language structures in that they form a template upon which variations in behavior among individuals and cultures can unfold.¹² O'Hara picks up where Hoffman leaves off by providing specific examples of ways in which neuroscience might be used to improve the law. In the context of agency, neuroscience might help us better understand which sets of empirical assumptions about contextual trustworthiness are supportable.¹³ Neuroscience also may play an important role in helping the legal system "devise mechanisms for creating optimal incentives for individual and corporate behaviour."¹⁴

The next two essays, Robert Hinde's *Law and the Sources of Morality* and Owen Jones's *Law, Evolution and the Brain*, examine the principles of evolutionary biology that provide a foundation for the proximate brain mechanisms involved in morality and law. Hinde's argument is that morality is created over time by dialectical transactions between what individuals do and

4. *Id.* at xiii.

5. *Id.*

6. *Id.* at xv.

7. *Id.* at xiv.

8. *Id.*

9. *Id.*

10. *Id.* at xv.

11. Morris B. Hoffman, *The Neuroeconomic Path of the Law*, in *LAW AND THE BRAIN*, *supra* note 1, at 1.

12. *Id.* at 17.

13. Erin Ann O'Hara, *How Neuroscience Might Advance the Law*, in *LAW AND THE BRAIN*, *supra* note 1, at 27-28.

14. *Id.* at 30.

what their cultures say they are supposed to do.¹⁵ According to Hinde, certain pancultural propensities, such as looking after one's own interests and behaving prosocially to others, exist, and neither genes nor an outside source are wholly responsible for these propensities.¹⁶ Moving from the general to the specific, Jones shows how evolutionary analyses in law¹⁷ may be used to clarify cost-benefit analyses, assess the comparative effectiveness of legal strategies, and reveal deep patterns in legal architecture.¹⁸ One of Jones's arguments is that sound behavioral models need to "include life-science perspectives on the proximate and ultimate causes of human brain function."¹⁹

In the final introductory essay, *A Neuroscientific Approach to Normative Judgment in Law and Justice*, Oliver Goodenough and Kristin Prehn review the research in the area of normative judgment. Students will appreciate this essay for its overview of traditional models of normative thinking.²⁰ Anyone who has ever wondered whether there is a "moral" part of the brain will enjoy the authors' review of neuroimaging research investigating the neural basis of normative judgment.²¹

Terrence Chorvat and Kevin McCabe's *The Brain and the Law* and Paul Zak's *Neuroeconomics* show how advances in neuroscience can contribute to economic analyses, especially in the areas of economic exchange and institution building. Chorvat and McCabe believe that the most important areas of research in cognitive neuroscience, relative to the law, are the "neurobiology of moral questions, the neural functioning of individuals in ultimatum and trust games, the neurobiology of social rejection," and investigations into the automation of conscious decisions.²² At first I was surprised by the authors' inclusion of the neurobiology of social rejection in this list, but their discussion of the pain and suffering that may result from social exclusion convinced me that perhaps "the law should attempt to align this pain with the socially desired behaviour."²³ Zak's essay, which contains straightforward definitions as well as basic brain facts, brain terminology, an introduction to the latest methods of neuroimaging, a summary of major findings in neuroeconomics, and a neuroeconomics acronym glossary,²⁴ will work very nicely as a first reading in a course or course segment devoted to neuroeconomics.

15. Robert A. Hinde, *Law and the Sources of Morality*, in *LAW AND THE BRAIN*, *supra* note 1, at 37, 47.

16. *Id.* at 38.

17. Owen D. Jones, *Law, Evolution and the Brain: Applications and Open Questions*, in *LAW AND THE BRAIN*, *supra* note 1, at 57.

18. *Id.* at 70–74.

19. *Id.* at 60, 74.

20. *Id.* at 79–84.

21. Oliver R. Goodenough & Kristin Prehn, *A Neuroscientific Approach to Normative Judgment in Law and Justice*, in *LAW AND THE BRAIN*, *supra* note 1, at 93–94.

22. Terrence Chorvat & Kevin McCabe, *The Brain and the Law*, in *LAW AND THE BRAIN*, *supra* note 1, at 118–24.

23. *Id.* at 122.

24. Paul J. Zak, *Neuroeconomics*, in *LAW AND THE BRAIN*, *supra* note 1, at 136–50.

Jonathan Fugelsang and Kevin Dunbar's *A Cognitive Neuroscience Framework for Understanding Causal Reasoning and the Law* and Sean Spence and others' *A Cognitive Neurobiological Account of Deception* examine courtroom implications of advances in neuroscience. Litigators in particular will find intriguing Fugelsang and Dunbar's review of functional neuroimaging research examining the neural correlates of complex causal reasoning.²⁵ After suggesting that we might not be aware of how our expectations can influence our evaluation of evidence, the authors lay the groundwork for future research, which could examine the role of making individuals aware of the potential biasing effects of their beliefs prior to engaging in legal reasoning.²⁶ All attorneys, as well as litigants and judges, should familiarize themselves with the essay of Spence and others, which reviews investigations of the neural correlates of deception. The authors report the association between attempted deception and activation of the executive brain regions and suggest the potential uses of these associations in forensic practice.²⁷

Lawyers who struggled with future interests during law school will welcome the clarity of the only essay in the Property in Biology and the Brain section, which is Jeffrey Stake's *The Property "Instinct."* Stake proposes that fundamental principles of property are encoded in the human brain: "Property is more than a social invention; it is a set of feelings built into our brains to solve survival problems confronting our ancestors."²⁸ According to Stake, recognizing a "deep property structure," which can be analogized to a deep language structure, may assist in understanding rules of property, including those relating to "first in time, first in right" and possession.²⁹

The final four essays examine the implications of advances in neuroscience for criminal responsibility and punishment. In *For the Law, Neuroscience Changes Nothing and Everything*, Joshua Greene and Jonathan Cohen argue that new neuroscience will change the law, not by undermining its current assumptions, but by transforming our views of free will and responsibility: "Free will as we ordinarily understand it is an illusion generated by our cognitive architecture."³⁰ Greene and Cohen recommend shifting away from punishment aimed at retribution and moving towards "a more progressive, consequentialist approach to criminal law."³¹

25. Jonathan A. Fugelsang & Kevin N. Dunbar, *A Cognitive Neuroscience Framework for Understanding Causal Reasoning and the Law*, in *LAW AND THE BRAIN*, *supra* note 1, at 158–60.

26. *Id.* at 163.

27. Sean A. Spence et al., *A Cognitive Neurobiological Account of Deception: Evidence from Functional Neuroimaging*, in *LAW AND THE BRAIN*, *supra* note 1, at 178.

28. Jeffrey Evans Stake, *The Property "Instinct,"* in *LAW AND THE BRAIN*, *supra* note 1, at 201.

29. *Id.* at 187.

30. Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Nothing and Everything*, in *LAW AND THE BRAIN*, *supra* note 1, at 207, 224.

31. *Id.* at 207.

A must-read for criminal law scholars is *The Frontal Cortex and the Criminal Justice System*, by Robert Sapolsky.³² Here, Sapolsky examines the role of the prefrontal cortex in cognition, emotional regulation, control of impulsive behavior, and moral reasoning, and argues that contemporary neuroscience does not support the “inability to tell right from wrong” test as the sole basis for the insanity defense.³³

If you tell your teenagers to “make good choices” before they borrow your car for the evening, you need to read *The Emergence of Consequential Thought: Evidence from Neuroscience*, by Abigail Baird and Jonathan Fugelsang. The authors examine counterfactual thinking, which is the “ability to imagine alternative outcomes and understand the consequences of those outcomes.”³⁴ Their brain-based model for the generation of such thinking suggests that young adolescents may lack the neural hardware to generate behavioral alternatives and potential outcomes prior to the initiation of risky behavior.³⁵ (Warning: If you do not have children, this essay may cause you to think counterfactually about having them!) In the final essay of the collection, *Responsibility and Punishment: Whose Mind?: A Response*, Oliver Goodenough asks us to consider the law of responsibility from a unique perspective; that is, from the brain of the punisher, not the punishee.³⁶

Law and the Brain is sophisticated enough for the seasoned neuroethicist, but I would also recommend it to anyone who would like an introduction to the trans-disciplinary nature of neuroscience and the law.

32. Robert M. Sapolsky, *The Frontal Cortex and the Criminal Justice System*, in LAW AND THE BRAIN, *supra* note 1, at 227.

33. *Id.* at 227, 239.

34. Abigail A. Baird & Jonathan A. Fugelsang, *The Emergence of Consequential Thought: Evidence from Neuroscience*, in LAW AND THE BRAIN, *supra* note 1, at 245.

35. *Id.* at 246, 254.

36. Oliver R. Goodenough, *Responsibility and Punishment: Whose Mind?: A Response*, in LAW AND THE BRAIN, *supra* note 1, at 259, 261.