

# **Law, Behavior and the Brain: Squaw Valley 2005**

Report by Cheryl Boudreau, Edward Dauer, and Terry Maroney

The Gruter Institute hosted its annual “Law, Behavior and the Brain” conference from May 22-25, 2005 at Squaw Valley, California. More than 50 scholars and practitioners from fields ranging from legal theory to neuroscience came together to share and discuss their work. Major themes explored included the relevance of new brain-imaging techniques to understanding law-relevant behavior and its regulation; the nature of emotion and its role in law; the interplay of biological and economic theories of behavior in both humans and non-humans; and questions of determinism and free will in an era of increasingly sophisticated understanding of biological influences on behavior. Punctuated by lively debates, a stimulating and well-received keynote address, and a characteristically hilarious closing dinner, the conference was energizing for all involved.

Day One started off with a warm welcome from the conference organizers: Monika Gruter Cheney, the Gruter Institute’s Executive Director; Oliver Goodenough (Vermont Law School); and Morris Hoffman (District Court Judge, Second Judicial District), whose opening talk explored broad themes of personal responsibility and the interlocking puzzle of genes, brain, and behavior. Noting that he understands humans less the more he knows about them, Hoffman proposed that the human brain be regarded as “an indeterminate probability machine,” and opined that the search for understanding matters in itself, whether or not it “pays dividends” in explaining and controlling human behavior. His talk was followed by a panel on “what to look for at Squaw Valley 2005,” in which Jeff Stake (Indiana, Law), Sarah Brosnan (Emory, Anthropology), and Paul Zak (Claremont Graduate University, Neuroeconomics) forecasted an animated interdisciplinary exchange on law, biology, and neuroscience.

Diving straight into the substance, first up was Hank Greeley (Stanford, Law), who painted a picture of how advances in neuroscience might change our culture and legal system. Specifically, Greeley proposed that neuroscience soon may enable us to predict various

phenomena (such as who will suffer from Alzheimer's disease), read minds (such as the minds of judges or jurors), and enhance cognitive performance, and asked how each such advance might portend a change in law and the administration of justice. Greeley's presentation spawned conversations about the potential legal ramifications of neuroscience research. Lionel Tiger and Jose Liht (Universidad Iberoamericano, Psychology, Mexico) followed with provocative research on the minds of terrorists.

Conversation then shifted to an analysis of two recent Supreme Court decisions: *Roper v. Simmons* (juvenile death penalty) and *Booker v. United States* (federal sentencing guidelines). Al Alschuler (Chicago, Law), Sara Beale (Duke, Law), Ted Blumoff (Mercer, Law), Goodenough, and Hoffman offered insightful commentary and raised thought-provoking questions about whether and to what extent neuroscientific and psychological research played a role in these decisions. Discussants noted the important questions that these two cases raise about both the role of punishment and our concepts of the brains and minds of defendants (particularly adolescents) and legal decisionmakers (the judges and juries whose respective roles are altered by *Booker*).

In the first of several presentations touching on the relationship between law and emotion, Terry Maroney (NYU, Law) provided us with a new taxonomy for the rapidly growing literature linking the two. Maroney began by citing several examples of how the intersection of law and emotion manifests itself in our legal system—such as the excited utterance exception to the hearsay rule and payment of damages for emotional harms. Proposing six theoretical categories underlying the existing literature, Maroney suggested that the study of emotion has deep implications for both the study and practice of law and set forth a road map of how that intersection might be best explored. Joining her on a panel of new work were Elizabeth Chorvat (Harvard, Law), who proposed a personal bargaining model for corporate lobbying, and Fritjof Haft (University Tübingen, Germany), who discussed Roman law and the “sense of justice.”

Day Two opened with a talk by Peter Richerson (UC Davis, Environmental Studies) on cross-cultural studies of perceptions of fairness, presenting data on cross-national experimentation with the “ultimatum game”; Tanzanian tribes' varied systems for penalizing cattle rustling; and perceptions of “honor” among Southern white males. Owen Jones (Vanderbilt, Law), in response, mused that the intersection of behavioral biology, psychology, and anthropology can inform law by enriching our understanding of “human nature” and its

simultaneous universality and plasticity. A lengthy debate ensued about the term “human nature”—Richerson insisting it was a dead letter consisting of nothing more than “Darwinian essentialism,” Jones proposing that it be replaced with “species-typical behavioral dispositions,” and participants generally agreeing that some new term must be coined to recognize both variation and (at least limited) stable tendencies across human cultures.

Returning to the theme of emotion, Liz Phelps (NYU, Psychology, Cognition & Perception) presented new neuroscientific research on the social learning of fear, focusing on the role of the amygdala in aversive learning. Phelps discussed three types of fear-learning mechanisms: conditioning (such as the pairing of electrical shock with particular stimuli), instructing (being told to fear something), and observation (watching others have an aversive reaction), and showed that the human amygdala is implicated in each of these. She then asked if the amygdala might play a role in implicit race bias, and presented research demonstrating that the amygdala is selectively activated by exposure to non-familiar outgroup faces (e.g., whites observing blacks), regardless of the subject’s self-assessment of racial bias, with some limited modulating forces (including self-reports of past interracial dating). Finally, addressing appetitive as opposed to aversive learning, Phelps showed that the striatum—a structure important to reward conditioning—is implicated in mechanisms of trust and perceptions of others’ moral character. Panel discussants—including Susan Bandes and Claire Hill (DePaul, Law), Terry Chorvat (George Mason, Law), and Erin O’Hara (Vanderbilt, Law)—pondered the significance of such research for the law, suggesting that it might be relevant to (to name just a few areas) capital sentencing, discrimination law, black/white economic success rates, and efforts to build cognitive models of legally relevant trust.

The remainder of Day Two was equally stimulating. Shifting to the realm of positive political theory, Mat McCubbins (UCSD, Political Science) posited that legislators communicate through the statutes they enact and that “signaling” research can inform judges’ approaches to statutory interpretation. Two panels took on issues of biology, the first exploring conflict resolution and the second the intersection of biology and culture. Doug Yarn and Greg Jones (Georgia State, Consortium on Negotiation and Conflict Resolution) gave an overview of the conflict management field and presented the results of computer simulations of resolution behaviors; Brosnan presented related primate research; Zak argued that there exists a “neuroendocrinology of trust”; David Sally (Dartmouth, Business) raised the issue of autistic-

spectrum disorders as shedding light on “normal” conflict perception and resolution tasks; and Doug Noll spoke about his experiences as a “professional peacemaker” and shared his model for negotiation and mediation. Richerson, Goodenough, and Francesco Romeo (Italy) returned to the theme of “human nature” and culture, with Romeo sharing his insights from work with artificial intelligence.

The day was capped off in grand fashion with a keynote by Abigail Baird (Dartmouth, Psychological and Brain Sciences) titled “Adolescent Decision-Making: Much More than an Oxymoron.” Baird explored neuroscientific research on the development of the adolescent brain and its functioning compared with the adult brain, including differential patterns of recruitment of prefrontal cortices. Baird illustrated her points with photos and videos showing what many participants groaningly recognized as “typical” teenage reasoning and impulsive behavior: girls musing that it was fine to swim with sharks if a friend went with you; boys sledding over one another’s heads and hurling themselves off towers. Her provocative talk provided conversation fodder for the remainder of the conference.

Day Three began with a response by Edward Dauer to the previous day’s panel on Conflict Resolution, through the lens of medical malpractice claims. Data from three countries show that money-damages claims are surrogates for other drives (sanction, correction, communication), suggesting possible reforms in that area of law. Christoph Engel (Germany) and William Casebeer (Naval Postgraduate School, Philosophy) offered two different but compatible perspectives on the neurobiological substrates of moral reasoning. Engel described the brain as having a fixed hermeneutical apparatus that develops moral or “legal” sense through learning about normative expectations, in part by testing and reforming tentative world views to match experience. Casebeer described the complex capacities of the brain as affording humans extensive control over their actions, thus accommodating the seeming determinism of neurobiology to the legal presumption of free will.

Stake and Goodenough then discussed analogous ideas in the context of property rights. According to Stake, the sense of property may reside in brain structures evolved to deal with costly conflicts over scarce resources. Goodenough suggested that overprimed brain receptors may account for the apparent strength of respect for tangible property ownership as compared with intangible property. Given the relatively recent genesis of intangible property the high cost of policing behaviors that are not resonant with evolutionary inheritances, legal systems should

consider whether the cost of enforcing such ownership rights is worth the gain. These same themes were taken up in a later panel including reports from Dorothy Glancy and June Carbone (Santa Clara, Law). John Clippinger's (Harvard) discussion of the trend to "open source" technology offered a concrete way to understand and test these hypotheses.

Six presentations of works in process provided a smorgasbord of innovative and promising research: Cheryl Boudreau's (UCSD, Political Science) study of jurors – presumed to be unsophisticated and subject to manipulation within the legal process – suggested that organizational substitutes for sophistication can enhance the quality of decision-making. Thomas Geu's (South Dakota, Law) work in the teaching and acquisition of professional judgment showed that the methods of categorization and decision analysis employed by professionals differ in qualitative ways from those employed by novices. Julie Seaman (Emory, Law) took on sexual harassment law and argued that employers should be held responsible for understanding how workers' evolutionarily predictable behaviors may create a hostile work environment. Natalia Walter (Internat'l Rescue Comm'ee) urged reform of laws that condition immigration relief for victims of slavery on their "full cooperation" with authorities – a behavior that is significantly inhibited by neurobiological responses to trauma. Jones and Brosnan reported early results of their effort to demonstrate "endowment effects" in the exchange behavior of chimpanzees. (In a very lively discussion, participants debated the applicability of non-human studies to the assessment of economic principles such as the exchange-behavior assumptions of Coase.) Finally, in a related study, Brosnan and Mark Grady (UCLA, Law) discussed their findings that chimpanzees display altruistic and mutual exchange behaviors that humans find difficult, while the commodity barter common to humans is exceedingly difficult for chimpanzees. Grady speculated that perhaps chimps have had no evolutionary need to develop commodity-barter skills.

Two papers directly addressed the link between biology and economic behavior. Zak's research on the neuroeconomics of social behavior demonstrated a role for oxytocin in the phenomenon of "trust;" and Carl Bergstrom's (U. Washington, Biology) grand tour of signaling and communication (ranging from individuals to immune systems, and including marvelous video of an octopus with advanced impersonation skills), provided behavioral models for effecting communication in a world of competing honest signalers and saboteurs – suggesting

that distributed authority and social policing of false signaling offers an efficient way to support signaling honesty.

The 2005 conference ended as do all annual Squaw Valley gatherings: with a rousing group-participation contest after dinner, in which tables presented bizarre and hilarious skits tying together the gathering's central themes. While far too silly to capture here, suffice it to say that performances included acrobatics, several singing production numbers, a memorable impersonation of a cow, an actual adolescent making decisions, and multiple references to swimming with sharks. At more serious moments throughout the conference, one could glance around the room and observe a biologist exchanging ideas with a legal scholar, a cognitive scientist offering suggestions to a political scientist, and an economist discussing her experiments with a psychologist. In this way, this year's conference remained true to the Gruter Institute's core mission of fostering multidisciplinary research and collaboration in a warm and open environment of person-to-person interaction. Participants left Squaw Valley better informed, excited by new research directions, and chuckling at the humor and energy of their colleagues.