

# Fundamentals of Neuroscience and the Law



# Fundamentals of Neuroscience and the Law:

*Square Peg, Round Hole*

By

Erica Beecher-Monas  
and Edgar Garcia-Rill

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By Erica Beecher-Monas and Edgar Garcia-Rill

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## **Dedication**

Often times posthumously rendered accomplishments are exaggerated. This is not true for Erica Beecher-Monas. In her case, the perseverance, honesty, and grace with which she lived her personal life was applied in equal measure to her work. Since our collaboration began in 1998, her incisive, original, and substantive ideas on what the law should do for society have been at the forefront of her efforts. This book is a tribute to the productive accomplishments over that time that resulted in a number of important contributions. Through a protracted illness, she worked doggedly on this book that stands as a legacy to a unique law professor. Just as in neuroscience, few in legal academia realize how removed their daily endeavors are estranged from everyday life. The consequences of such an estrangement for the well-being of society are significant. It is to the more informed decision-making, the more humane policy drafting, and the more relevant law enactment, that Erica devoted her life. And she did so with the same love and commitment she had for her children and grandchildren, to whom this book is dedicated.



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# FOREWORD

BY T. BEINER,

DEAN AND NADINE BAUM DISTINGUISHED PROFESSOR OF LAW,  
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Twenty years ago, a neuroscientist and a legal scholar became friends and (as truly great researchers are wont to do) intellectual collaborators. In many ways, this book is the culmination of the intellectual partnership between Erica Beecher-Monas and Edgar Garcia-Rill. It is with great sadness that I write this foreword after my dear friend, Erica, passed away in 2017. For those of us who knew Erica, we had the privilege of engaging with a person who was truly excited by ideas. Erica loved ideas and threw herself into the life of the law, developing her unique concept of intellectual due process in the context of scientific evidence. This set her apart among scholars of evidence law – an area of the law that is dominated by male legal scholars. Erica’s contributions in the areas of scientific evidence and the intersection of neuroscience and law are groundbreaking.

Erica, of course, was more than an impressive academic mind. She possessed a wonderful spirit. Erica lived life large. She enjoyed and embraced life and the world. She was generous, kind, and enthusiastic. Even after her illness required her to use an oxygen tank, Erica would cheerfully tell you that it was “no big deal.” Life was good, and her illness would be fixed by modern medicine. She persevered through her illness with a positive attitude that was remarkable.

Add to this indomitable spirit the partnership she formed with neuroscientist Edgar Garcia-Rill, and the result is the book you have in front of you. I was privileged to have a ringside seat as Edgar and Erica began their intellectual collaboration. I was a lucky observer and occasional participant at many a dinner party as they discussed and sparred over ideas. Both possess a similar engagement with ideas and a desire to inform and educate the world for the benefit of society as a

whole. Erica and Edgar wrote six articles together about the intersection of neuroscience and law. Their collaboration was unique in the legal and scientific academy and contributed a truly novel approach to how brain science can inform legal rules. I only wish that their partnership could have lasted longer. However, we should all be grateful that, prior to Erica's death, she and Edgar committed to paper this last collaboration.

## PREFACE

The goals of this effort are to provide a seminal book for a course on Neurolaw that will allow the law student to understand the currently stunted understanding of how neuroscience is applied to legal decisions, and to provide a more modern and rational view of neuroscience that will allow attorneys and judges to better design and interpret laws. The current view of the brain by many judges and attorneys is seriously outdated and is more urban legend than science. Moreover, changes in our understanding of the brain and behavior are resisted by such outdated positions. This results in reluctance to rationally interpret laws and to implement recent decisions that would benefit society.

In Chapter 1 we will address the paradigm shift that is needed in law. The concept of human cognition and behavior underlying legal rules and applications is outdated and wildly inaccurate. In consequence, not only is our justice system failing to achieve its goals of truth and accuracy (not to mention social control), but our prisons are filled with the untreated mentally ill, and recidivism is rampant. Neuroscience has greatly advanced our understanding of both cognition and behavior, but its findings are not reaching the legal system, or are reaching it in very distorted versions. Many of the systemic problems threatening to overwhelm American criminal justice could be ameliorated if the two disciplines –neuroscience and law—were more in sync.

Although increased interdisciplinarity would help the communication problem between law and neuroscience, both disciplines have a common failing, a search for unwarranted certainty. In Chapter 2, we review the insights of Sir Karl Popper, who explained that in our search for truth, we may get close, although we can never be certain that we have reached it. That is, science is not about absolute truth but about a better and better answer. This is an important concept for both neuroscience and law. In this Chapter, we will review the impact of Popper on the courts, including the Supreme Court's *Daubert* opinion.

In Chapter 3, we explore how legal misunderstandings about basic scientific concepts such as statistical significance, base rates, relative risk, etc. are lost in translation and lead to dramatically unscientific opinions. Judges' search for certainty from experts is confounded by their lack of understanding about inconstant biology, complexity theory, and nonlinear dynamics. In this Chapter, we will explain how some familiarity with these concepts would vastly improve judicial decision-making.

Chapter 4 deals with the peculiar case of lie detection, and how unwarranted trust was previously placed on "lie detectors", and how even more misguided faith is being placed on functional magnetic resonance imaging (fMRI). The development of fMRI technology has prompted legal scholars and lawyers to advocate neuroscience as the latest legal frontier, suggesting that neuroscience will provide solutions to the age-old questions of detecting deception, assigning criminal responsibility, and rethinking punishment strategies. However, most of the massively increased legal attention to fMRI research is founded on a misconception about what the technology is capable of showing.

In Chapter 5, we assess current neuroscientific evidence on the biology of violence. There is a growing body of evidence on the biology of violence. Body, mind, and emotions are the products of evolutionary processes. The human brain processes information first through evolutionarily conserved systems, that is, old, instinctive kinds of systems that are first and foremost, "emotional." The newly evolved parts of the brain get their information from these primordial, emotional systems. These systems are modulated by newly evolved, presumably "rational" elements. It is the interplay of these paradoxical partners that lies at the root of violent behavior.

Chapter 6 deals with the unique case of attempting to predict violent behavior. As discussed in Chapter 5, violent propensities have been shown to correlate with abnormalities in the structure and function of the brain. These abnormalities, combined with environmental factors—such as stress or drug and alcohol abuse—can increase the chances that a particular individual will become violent. Indeed, many of the risk factors measured by actuarial assessments of violence risk may be tied to an underlying biological function. Thus, biology may explain the statistical correlations between violence and risk factors.

However, the expanding field of genetics does not provide the easy answers that those espousing detection of future dangerousness purport. A realistic understanding of what genes really do, and cannot do, is essential.

One subject which we do not address in this book is drug and alcohol abuse. These topics are beyond the scope of the book, which deals with the more basic states of consciousness, arousal, and intent. The brain regions most related to drug and alcohol abuse include the basal ganglia and limbic system. Both regions are a step above the more basic reticular activating system responsible for waking, arousal, and awareness, much more basic, yet ignored, elements in the consideration of intent and mental illness.

In Chapter 7 we consider intent and the legal concepts of *mens rea* and *actus reus* and address the kinds of evidence that are admissible in demonstrating their absence. We contrast the legal concepts of *mens rea* and *actus reus* with the affirmative legal defense of insanity. We delve into the role of arousal in insanity with mental disease, and discuss psychiatric diseases, such as schizophrenia, and sleep-wake states such as sleep-walking, etc. We explore the ways in which outmoded concepts of human behavior are still current in the law, and shine a light on these legal misunderstandings with a more modern scientific understanding of these concepts. This Chapter explores updated evidence from the neuroscience of voluntary movement and free will that now allows us to reconsider the legal concept of *mens rea*. Such information could not come at a better time since the courts have thoroughly muddled the separate inquiries of whether an accused had the requisite intent with the issue of whether the accused, although having the requisite intent, should be excused by reason of insanity. This has untoward consequences, including the exclusion of evidence, and shifting the burden of proof. It also tramples on the fundamental principle of jurisprudence that the prosecution must establish all elements of a crime beyond reasonable doubt. It undermines the defendant's right to present evidence, and it circumvents the prosecution's burden of proof. To untangle this mess, we examine the neuroscience of intent.

Chapter 8 focuses on the legal insanity defense, addressing first psychosis and schizophrenia, especially its dysregulation of arousal. Legal decisions made regarding the kinds of evidence available for the

insanity defense are often at distinct odds with scientific understandings. This is a two-part problem. First, legislatures are permitted to define insanity without scientific basis, and they have increasingly narrowed the definition, so that in many states what must be shown is that the defendant could not tell right from wrong. Second, judges who are required to apply these laws are often stymied by their own lack of scientific understanding. As a result, evidence scientifically relevant to a determination of responsibility is frequently excluded.

In addition, we discuss the peculiar case of posttraumatic stress (PTSD) testimony. A brain dysfunction characterized by a particular set of arousal symptoms, PTSD testimony ought to be admissible whenever mental state or injury is at issue. In a significant percentage of people, exposure to trauma, combat, domestic violence, rape, sexual abuse, burns, disasters, violent crime, etc., results in PTSD. The symptoms of this disorder include re-experiencing the trauma, avoiding situations or activities reminiscent of the original trauma, and increased arousal or hypervigilance. Curiously, however, PTSD testimony is often excluded from evidence (generally without any analysis of its scientific validity) in precisely those circumstances where it would be the most helpful to the fact-finder. In sharp contrast, clinically questionable psychological syndrome testimony (such as “battered woman syndrome”), which rests on very shaky ground indeed and cannot meet standards of scientific validity, is widely admitted (also largely without any analysis of its scientific merit).

In Chapter 9, we return to the consequences of novel interpretations on the neuroscience of voluntary movement and the notion of intent. These ideas suggest that we are normally responsible for everything we do, that our actions do not originate from an unconscious brain process but rather a conscious, or rather from preconscious, awareness of the world around us.

What, then, should a nonscientist judge take from this discussion? This Chapter also considers the future of neurolaw. First, where controverted expert testimony about mental state is proffered, it is abuse of discretion not to engage in a validity analysis. Evaluating testimony about mental state is made easier and more rational by understanding that mental state is like the “road of life”, and thinking about sanity as a probability rather than an either-or proposition. At



any given time there is a probability of where a person will be on the road. We cannot predict where on the road they will be at the next moment. All we can say is what the probability is that at a particular time the defendant was in the ditches instead of driving on the right side of the road. Mental disorder increases the probability that someone will be in the ditch rather than driving on the correct side. The model of the “road of life,” which we develop in this chapter, helps explain how the brain works in health and disease. By realizing that science is no longer about causes, it is about mental state, so that sanity is not an all or nothing issue, but a probabilistic statement, even a generalist judge can be better prepared to evaluate such testimony.



## CHAPTER ONE

# TIME TO SHIFT THAT PARADIGM: LAW'S OUT-DATED VIEWS ON HUMAN BEHAVIOR

### 1. Introduction

Law is based on numerous assumptions about human behavior. The “reasonable man”,<sup>1</sup> who rationally evaluates the costs and benefits of his actions before deciding to act, populates the law. This is true in all areas of the law, but especially in criminal law. Concepts basic to legal understandings, such as ideas about choice, volition, free will, and rationality, are all concepts that originated, not from empirical knowledge of human beings but from beliefs about what human beings are or should be. Moreover, laws that are interpreted by judges reflect their assumptions about human behavior, and so judges frequently preclude as irrelevant evidence about how human beings actually function. Accepted legal doctrine reflects an anachronistic perspective on human behavior.

For example, in criminal law, liability depends on the accused having committed a voluntary act (*actus reus*) with intent to do harm (*mens*

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<sup>1</sup> A reasonable man is an average (read middle-class) bloke, the “man on the Chapham bus.” In criminal law, the reasonable man standard is primarily invoked for provocation defenses. *See* *Maier v. People*, 10 Mich. 212, 220 (1862) (defining a reasonable man as an “ordinary man” in discussing the law of provocation). Although the reasonable man is now the reasonable person, that person “still functions within legal doctrines conceived by men and interpreted to fit the facts of men’s lives.” Marina Angel. 2008. “Why Judy Norman Acted in Reasonable Self-Defense: An Abused Woman and a Sleeping Man.” *Buff. Women’s L. J.* 6: 65-92. The Model Penal Code defines a reasonable man as a law-abiding person in the actor’s situation. Model Penal Code § 2.02(2)(c) (1962).

*rea*).<sup>2</sup> These are both elements that the prosecution must prove, but the question of what evidence may be admitted to prove either element is narrowed by antiquated ideas about what “voluntary” and “intent” mean. Rather than permit expert mental health testimony that might explain these terms in the defendant’s circumstances, courts often take a context-free perspective, relying on prior courts’ definitions and admissibility decisions. This also happens with the affirmative insanity defense.

Because the common law is based on a system of precedent, it is often slow to change. Many of our current courts’ ideas about what counts as intent, volition, and rationality are fossils from the Nineteenth Century. We have learned a great deal about human behavior since that time, however.

## 2. Historical Roots of Current Law

Carl Friedrich characterized law as “frozen history.”<sup>3</sup> So perhaps we can understand our current laws by examining how they evolved. Early criminal law evolved from the blood feud and the state’s monopolization of vengeance; intent had nothing to do with it.<sup>4</sup> But by the Twelfth Century, church law began to insist that a mental element of evil intent was necessary for criminal conviction.<sup>5</sup> By the Thirteenth Century, most felonies involved intent.<sup>6</sup> Morality had crept into the law by the Seventeenth Century, and evil intent became as necessary for conviction as the unlawful act.<sup>7</sup> Coke, for example, posited the view that there could be no felony in the absence of an evil mind.<sup>8</sup> Even before then, homicide had begun to evolve into two classes, homicide

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<sup>2</sup> Some regulatory offenses do not require *mens rea*, but most criminal offenses do.

<sup>3</sup> See Carl Friedrich. 1963. *The Philosophy of Law in Historical Perspective*. Chicago: Phoenix Books, Univ. Chicago Press.

<sup>4</sup> See Frances B. Sayers. 1932. “Mens Rea.” *HARV. L. REV.* 45: 974-1021 (quoting the 1118 *Legis Henri Principi* that “he who commits evil unknowingly must pay for it knowingly”).

<sup>5</sup> *Id.* at 978.

<sup>6</sup> *Id.* at 981 (noting that homicide, robbery, arson, and rape all required some intent at this time).

<sup>7</sup> See *id.* (observing a “strong drift to intent” after the Thirteenth Century, becoming essential by the Seventeenth Century).

<sup>8</sup> E. Coke. 1641. *Institutes of the Lawes of England* 6, 107.

with “malice aforethought” (punishable by death), and manslaughter (meriting a lesser punishment).<sup>9</sup> By the Eighteenth Century, Blackstone focused on whether the defendant was responsible, in the sense of exercising his will, and marginalized both intent and excuses.<sup>10</sup> By will, Blackstone did not mean that the precise conduct or harm was intended, but that the defendant had in fact exercised a will meaningfully connected to the harm. Mere awareness of one’s physical movements might suffice.<sup>11</sup>

### 3. Human Nature in the Nineteenth Century

By the Nineteenth Century, the focus of criminality was on character defects in individuals whose socially problematic and illegal behavior arose from some of those defects. The foundation for criminal liability had become a concept of moral blameworthiness based on an individual’s free mind choosing evil over good behavior. Crime was thought to be the product of individual choice to act immorally.<sup>12</sup> This view, of moral blameworthiness as a deliberate choice, is based on ideals of will power, character, responsibility, and a belief that character was built through individual choice.<sup>13</sup> This was a highly

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<sup>9</sup> See Sayers, *supra* note 4, at 997 (noting that “malice aforethought” homicide emerged under Richard II in about 1389, and that “on the sudden” murders did not qualify).

<sup>10</sup> As far as Blackstone was concerned, “the only thing that renders human actions either praiseworthy or culpable “is the quality of the doer’s will. William Blackstone. 1769. *Commentaries on the Laws of England* 3: 20-33. Blackstone discussed excuses as reflecting a “defect of will.” But a “defect of will” was not an absence of intent; intent could mean anything from an awareness of the defendant’s physical movements to a fully subjective intention.

<sup>11</sup> *Id.* at 5. Blackstone was more interested in rationalizing the pursuit of public ends than with any concern that individuals might be used for public ends. See Sayers, *supra* note 4 at 998 (noting that Blackstone’s marginalization of excuses and intent would suggest a very strict standard of responsibility for a putatively virtuous citizenry).

<sup>12</sup> Michael L. Benedict. 1992. “Victorian Moralism and Civil Liberty in Nineteenth Century United States.” In *The Constitution, Law, and American Life* 91. Donald G. Nieman, ed. Athens, GA: Univ. Georgia Press.

<sup>13</sup> See, e.g., Gerald Leonard. 2003. “Towards a Legal History of American Criminal Law.” *Buff. Crim. L. Rev.* 6: 691-832. (noting the Victorian “simple, stout insistence on character, on an individual moral responsibility that

normative perspective, making the context of the choice irrelevant.<sup>14</sup> As one legal historian noted,

[T]he self-conscious cultivation of moral character and purpose was the serious business of every well-led life. Standards of right and wrong were assumed to be clear and timeless. Good behavior was the product of one's cultivated moral character and individual choice . . . . Bad behavior was equally the product of one's failure to cultivate one's character with adequate moral seriousness, and one's consequently bad choices were appropriately condemned by the institutions of civilization.<sup>15</sup>

Because character could be improved by willing to do the “right thing” (meaning the socially acceptable course) and then behaving according to social mores, failure to do so meant that an individual was personally morally responsible for—meaning in control of—the choices he made.<sup>16</sup> Failures in self-control were imputed to choice and to failure of will. Moral choices were those consonant with social norms. These social norms were considered timeless and non-contingent, and with the exception of excuses for duress and heat of passion, the context of the crime was irrelevant.<sup>17</sup>

The context-free assessment of individual responsibility made the notion of intent rather a generic enterprise. All that mattered was the

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posited without question the rightness and utility of individual consequences for individual choice”).

<sup>14</sup> See Leonard Levy. 1967. *The Law of the Commonwealth and Chief Justice Shaw* 321. Cambridge, MA” Harvard Univ. Press. (discussing the “pervasive individualism” of the pre-Civil War era, which considered that “guilt, like sin, is personal because each man is the captain of his own conduct ...[so] the law pictured personal action as the result of the exercise of free will”).

<sup>15</sup> *Id.* at 745-46.

<sup>16</sup> This was so in contract law as well, where the law shifted from concern for the overall fairness of the deal to “the convergence of the wills of the contracting parties” as the measure of legal validity. Morton Horwitz. 1974. “The Historical Foundations of Modern Contract Law” *Harv. L. Rev.* 87: 917-956.

<sup>17</sup> See Craig Haney. 1982. “Criminal Justice and the Nineteenth-Century Paradigm.” 6 *Law & Hum. Behav.* 191: 193-95. For a discussion of Victorian notions of the reducibility of events to individual moral choice, see David M. Gold. 1990. *The Shaping of Nineteenth-Century Law: John Appleton and Responsible Individualism*. Westport: Greenwood. (examining the work of an important judge).

decision and the result. The circumstances in which the person made a decision were wholly irrelevant. As Holmes asserted, the law's "indifference to a man's peculiar temperament, faculties and so forth" meant that "[a]cts should be judged by their known circumstances, not by the actual intent which accompanies them."<sup>18</sup> Holmes did not mean the social circumstances of the decision to act, however, just the circumstances of the crime itself.

Reason and rationality were also idealized, disembodied and context-free. Rationality itself was considered to be the self-maximizing calculus of costs and benefits. Emotions were impediments to rationality. Causation was mechanistic, Newtonian, but-for causation. Dualism was also very much part of this view, separating mind and body, thought and action, the guilty act and the guilty mind. Criminal liability depended (and still depends) on the prosecution proving the separate elements of *actus reus* and *mens rea*. *Actus reus*, the requirement of a voluntary act, depends on distinguishing a consciously willed bodily movement from one that is not willed.<sup>19</sup> *Mens rea*—the mental state of intent—had almost as many definitions as courts that addressed it. There continues to be little judicial consensus about what either of these terms mean.<sup>20</sup>

However, even in the Victorian era, disquieting exceptions to the notion of moral rationality and freedom of choice kept cropping up. The foundation of criminal liability, a responsible moral agent freely and voluntarily doing an act for evil purposes, obviously (even in the Nineteenth Century) did not apply to someone acting under duress. Coerced defendants were not exercising their own will. Infants and the insane did not have the power of reason, and so could not be held

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<sup>18</sup> Oliver W. Holmes. 1881. *The Common Law* 57, 66. Cambridge, MA: Harvard Univ. Press.

<sup>19</sup> See Larry Alexander. 2011. "Criminal and Moral Responsibility and the Libet Experiments." In *Conscious Will and Responsibility* 204. Walter Sinnott-Armstrong & Lynn Nadel, eds. Oxford: Oxford Univ. Press. (observing that criminal law is based on a "consciously willed bodily movement").

<sup>20</sup> See Ian P. Farrell, and Justin F. Marceau. 2013. "Taking Voluntariness Seriously." *B.C. L. Rev.* 54: 1545-1602 (observing that although every crime requires a voluntary physical act and a mental state there is no consensus as to the meaning of either).

to have made reasoned choices about their actions.<sup>21</sup> Sleepwalkers could not be said to be acting voluntarily, and so were excused.<sup>22</sup> Heat of passion defenses rested on the idea that passion had overcome reason, at least temporarily.<sup>23</sup> If there were obvious impingements on rationality, some accommodations had to be made. Insanity for example, duress, extreme emotional distress (crimes of passion), and infancy were all excused, although there were (and still are) lots of debates about what these terms mean.

Complete lack of reason excused the accused entirely through the insanity defense. What exactly that meant, however, was (and continues to be) highly contested. The M’Naughten test provides for an insanity excuse if “at the time of committing the act, the party accused was labouring under such a defect of reason, from the disease of the mind, as not to know the nature and quality of the act he was doing; or, if he did know it, that he did not know he was doing what was wrong.”<sup>24</sup> Variations on this theme continue to be used in every state that has an insanity defense.

#### 4. Law’s Current Vision

While shadows from earlier eras may still creep into current criminal law, the formative era of American law was the Nineteenth Century.<sup>25</sup>

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<sup>21</sup> See Jessica Harrison. 2015. “Idaho’s Abdication of the Insanity Defense: An Ineffective, Costly and Unconstitutional Eradication.” *Idaho L. Rev.* 5: 575-605. (noting that the earliest recording of an acquittal for insanity was in 1505, and quoting William Lombarde, who wrote in 1581, “If a madman or natural fool, or a lunatic in the time of his lunacy [kills someone], this is no felonious act for they cannot be said to have any understanding will”).

<sup>22</sup> See, e.g., *Bradley v. State*, 277 S.W. 146, 148 (Tex. Crim. App. 1925) (reversing conviction where judge refused to give a charge of sleepwalking because “a somnambulist does not enjoy the free and rational exercise of his understandings and is more or less unconscious of his outward relations”); *State v. Overton*, 815 A.2d 517 (N.J. Super. Ct. 2003) (reversing because trial court excluded sleepwalking evidence).

<sup>23</sup> See, e.g., *Mahe v. People*, 10 Mich. 212, 219 (1862) (killing during heat of passion was manslaughter rather than murder because of “temporary excitement, by which the control of reason was disturbed”).

<sup>24</sup> M’Naughten’s Case, (1843) 10 Cl. & F. 200, 8 Eng. Rep. 718, 722 (H.L.)

<sup>25</sup> Roscoe Pound. 1938. *The Formative Era of American Law*. New York: Little Brown Co. Carl Friedrich characterized law as “frozen history.” Carl Friedrich.



These idealized views about human behavior still dominate the law.<sup>26</sup> Good behavior is still seen as the product of individual moral choice and moral character, both of which are believed to be under the individual's control, although exactly what "moral" means in the Twenty-First Century is somewhat up for grabs. It seems to mean social blameworthiness. Nonetheless, moral blameworthiness continues to be the touchstone of criminal law. But note that definitions of morality, character, and reasonableness are not neutral—they are all imbued with social norms.

As Justice Jackson explained in *Morissette*,<sup>27</sup>

The contention that an injury can amount to a crime only when inflicted by intention is no provincial or transient notion. It is as universal and persistent in mature systems of law as belief in freedom of the human will and a consequent ability and duty of the normal individual to choose between good and evil. . . . Unqualified acceptance of this doctrine by English common law in the Eighteenth Century was indicated by Blackstone's sweeping statement that to constitute any crime there must first be a "vicious will."<sup>28</sup>

Along with these concepts of rational choice, criminal law theories sprung up to justify punishing people who violated these norms. Criminal law is still seen as a means to create social control.<sup>29</sup> Current

1963. *The Philosophy of Law in Historical Perspective*. Chicago: Phoenix Books, Univ. Chicago Press.

<sup>26</sup> See, e.g., *Steward Machine Co. v. Davis*, 301 U.S. 548, 590 (1937) (J. Cardozo noting that "the law has been guided by a robust common sense which assumes the freedom of the will as a working hypothesis in the solution of problems"); *Gregg Cartage & Storage Co. V. United States*, 316 U.S. 74, 79-80 (1942) (J. Jackson noting that "the practical business of government and administration of the law is obliged to proceed on the assumption that mature and rational persons are in control of their own conduct"); *People v. Wolff*, 34 P.2d 959,971 (Cal. 1964)(contending that free will is "the basic behavioral concept of our social order").

<sup>27</sup> *United States v. Morissette*, 342 U.S. 246 (1952) (holding that *mens rea* is required for criminal liability). Notice that Justice Jackson transformed Blackstone's definition of a vicious will from awareness connected to public harm to intent.

<sup>28</sup> 342 U.S. 246, 250-51 (1952) (holding that *mens rea* is required for criminal liability).

<sup>29</sup> Certainly, Holmes thought so. See Holmes, *supra* note 19. Holmes collapsed all fields of law into general propositions and marginalized subjective intent

justifications for criminal conviction and punishment fall roughly into two camps, although there are many variations.<sup>30</sup> Consequentialists argue that the social benefits (of prevention, through deterrence, incapacitation, or rehabilitation) must outweigh the costs of enforcement (through policing, trials, and punishment).<sup>31</sup> Rights-based theorists, on the other hand, place a duty to punish wrongdoers on the community.<sup>32</sup> Most contemporary theorists recognize some role for both.<sup>33</sup> The law continues to distinguish act from mental state, and views rationality as an emotionless calculus of costs and benefits. H.L.A. Hart, for example, defined a person as a choosing being, who can rationally evaluate the social norm and the costs and benefits of violating it, deliberately choosing his actions.<sup>34</sup> In this scenario, crime is caused by an individual's failure—of choice, of reason, of moral character, all of which are within his control. Although legal cases are individual-centered, the individual is highly circumscribed. The context—internal and external—of individual action is virtually irrelevant, making explanations about the reasons for a defendant's actions largely inadmissible.<sup>35</sup> This severely limits the kind of evidence that courts see as relevant in a criminal trial. For example, while legal decisions about voluntariness and choice all involve

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in favor of public safety; he saw society as rooted in physical force, and thought no moral wrong was required for culpability.

<sup>30</sup> See, e.g., Paul Roberts, and Adrian Zuckerman. 2010. *Criminal Evidence* 9-11. 2d ed. Oxford: Oxford Univ. Press. (discussing theories of criminal conviction and punishment). Roberts & Zuckerman note that “a pithy way of summarizing the difference is to say that, whilst consequentialism is ‘no respecter of persons’ in always prioritizing aggregate social welfare over individuals’ personal interests, only deontological theories ‘take rights seriously.’” *Id.* at 11.

<sup>31</sup> *Id.* at 9.

<sup>32</sup> See, e.g., Michael S. Moore. 1997. *Placing Blame* Ch. 4. Oxford: Oxford Scholarship Online. (discussing deontological theories of criminal law).

<sup>33</sup> See Michael S. Pardo, and Dennis Patterson. 2013. *Minds, Brains, and Law* 180. Oxford: Oxford Scholarship Online. (noting that people appear to support both perspectives.)

<sup>34</sup> H.L.A. Hart. 1968. *Punishment and Responsibility* 49. Oxford: Oxford Scholarship Online.

<sup>35</sup> See M. Clark. 1975. “The Impact of Social Science on Conceptions of Responsibility.” *Brit. J. L. & Soc’y* 2: 32, 33-34. (“The essential background assumption of responsibility is that of the autonomous individual whose decisions are not to be explained by reference to anything other than [himself]”).

evaluations of the defendant's mental state, the courts are curiously resistant to evidence about mental state from experts. Instead, judicial constructions tend to equate any willful, deliberate, and premeditated killing with intent.<sup>36</sup>

Moreover, the courts' views on choice, voluntariness, rationality, and morality, not to mention character, control, and theories of criminal punishment are not empirically based. Rather, the courts tend to be aggressively self-referential. So when lawyers attempt to provide better explanations about the accused's behavior, and turn to scientific experts who might be able to explain the meanings of these concepts, they frequently run into the notion that law is a closed, logical system.<sup>37</sup> Judges with this formalistic notion of the legal enterprise tend to find scientific explanations for how the brain works and how people think and act irrelevant. Most courts continue to insist that insanity is a legal, rather than a medical construct, as are volition and intent, making advances in neurobiology irrelevant to law.

Now, as in the Nineteenth Century, judges and legal scholars attempt to justify the law's blinkered view of human nature as a question of evidence law. Because the law has defined *actus reus* and *mens rea*, and the various excuses (including insanity), any explanations that do not fit the narrow legal definitions are excluded as irrelevant. For example, Stephen Morse, a prominent legal theorist, castigates mental health professionals as misunderstanding the legal terms and trying to apply their own definitions.<sup>38</sup>

Professor Morse contends that, "at nearly all times, humans are conscious of themselves, perceive and are aware of what they are

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<sup>36</sup> See, e.g., *Commonwealth v. O'Searo*, 352 A.2d 30, 37-38 (Pa. 1976) (holding that "the requirement of premeditation and deliberation are met whenever there is a conscious purpose to bring about death").

<sup>37</sup> See Grant Gilmore. 2014. *The Ages of American Law* 56, 60. 2d ed. New Haven, CT: Yale Univ. Press. (noting "the quality of abstraction which came to characterize most legal writing seems like the mirror image of the idealized model of the economists").

<sup>38</sup> Stephen J. Morse. 1984. "Undiminished Confusion in Diminished Capacity." *J. Crim. L. & Criminology* 75, 38-40. (contending that the argument that in order to intend, a person must have the capacity to choose conduct and understand the nature of this choice is pure *ipse dixit*).

doing.”<sup>39</sup> Therefore, according to Professor Morse, almost all mentally disordered defendants have *mens rea*.<sup>40</sup> As a result of his analysis, Professor Morse contends that a schizophrenic woman, who had been in and out of mental institutions for most of her life, had the requisite *mens rea* for murder, because she planned for three days to drown her six-year old son in the bathtub in order to be rid of the socializing that motherhood entails.<sup>41</sup> Even though Professor Morse acknowledges that what he calls psychotics (like Tempest, the mother in the case) are grossly out of touch with reality, he argues that mental illness diagnoses are irrelevant—all that counts is what the accused thought, perceived, and believed.<sup>42</sup> Since the mother thought about killing her son, believed that drowning him would kill him, and perceived him drowning, she was guilty of murder.<sup>43</sup>

This narrow view does not reflect what we know about human behavior. As we will discuss later, in Chapter 7, saying a schizophrenic intends her actions is like saying a dreamer “intends” her dream actions, and holding a dreamer responsible for the content of her dreams. Professor Morse castigates Tempest’s mental health experts because they failed to fit their testimony into the correct narrow legal definitional boxes. Those legal boxes, however, reflect Nineteenth Century ideals of agency and choice rather than what we now know about human nature. This legal perspective does not appear to grasp that the brain controls thoughts (and acts): therefore, sick brain, sick thoughts, sick acts.

Curiously, Professor Morse would excuse a seven-year old for shooting his sibling even if he thought about and planned the killing for days, because “no moral blameworthiness attaches.” Why not? If planning and purpose is all that is needed for intent, the seven-year old surely had it. Professor Morse does not explain what he means by moral blameworthiness and why it would attach in one instance (Tempest) and not the other (the seven-year old).

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<sup>39</sup> *Id.* at 46.

<sup>40</sup> *Id.* at 53.

<sup>41</sup> *Id.* at 40 citing *Commonwealth v. Tempest*, 496 Pa. 436, 437 A.2d 952 (1981).

<sup>42</sup> *Id.* at 50.

<sup>43</sup> *Id.*

Infancy has always been an excuse (although the parameters of infancy have varied). Professor Morse's analysis appears to reflect Holmesian ideas that blameworthiness is whatever society determines it to be,<sup>44</sup> but that makes for a rather circular argument. The real question is why a seven year-old who has purpose and plan is exempt from criminal charges while a paranoid schizophrenic with a purpose and plan is not. Presumably, that's because a seven year-old's consciousness is not yet developed. But then why not a schizophrenic, whose consciousness is sick? We are not suggesting that the seven year-old should be criminally liable, only that the reason he isn't liable is that his brain is not yet fully functional—it has nothing to do with morality.

Even some people who are quite sophisticated about the brain would exclude as irrelevant to criminal trials evidence about how the brain works.<sup>45</sup> Michael Gazzaniga, for example, contends that “[a]n abnormal brain does not mean that the person cannot follow rules.”<sup>46</sup> But this is, empirically speaking, not true. Notably, prisoners with mental health issues are far more likely to have conduct infractions than the normal prison population and tend to serve 15 months longer on average than those without mental illness, often because of an inability to follow rules.<sup>47</sup> In Dr. Gazzaniga's opinion, responsibility emerges from the social context, and even schizophrenics can “stop at traffic lights and pay cashiers.”<sup>48</sup> Well, some can follow (some) rules some of the time. Some sleepwalkers (or sleep-drivers) do stop at traffic lights and pay cashiers. That does not mean that there was volition or choice involved. Moreover, as we will discuss more thoroughly in Chapter 2, so-called “insane” people may not be insane all the time. They may have episodes of insanity, during which the context changes.

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<sup>44</sup> Holmes, *supra* note 19.

<sup>45</sup> Michael Gazzaniga. 2011. *Who's In Charge? Free Will and the Science of the Brain*. New York: Little Brown Co.

<sup>46</sup> *Id.* at 193.

<sup>47</sup> Doris James, and Lauren Glaze. 2006. *Mental Health Problems of Jail and Prison Inmates*. Washington, D.C.: U.S. Department of Justice. (observing that 58% of state prisoners with mental illness, compared to 43% without, had been charged with rule violations).

<sup>48</sup> *Id.* at 194.

## 5. Who are We?

We all like to think of ourselves as autonomous agents, engaging our free will in making decisions about how to act. But is that the reality? How do people make choices? And what happens to this process if people have injured brains or mental disease? Although the law assumes that all humans have the ability to choose their actions, it does not define free will or how it comes about. Nor does it allow for the context of the decision. As we will see at various places in this book, the “context” in which we make perceptions is widely ignored yet influences the decision-making process. It ignores the basic premise that decisions and choices are made in context—they are responses to conditions in the social and physical (internal and external) environment. Far from being irrelevant, context is key to assessing what was done and why.

So, what would a new paradigm of human behavior look like? The first thing to remember is that we are biological organisms, acting and reacting to our environment, not isolated, disembodied minds. Long before living creatures had minds, they had efficient and adaptive behaviors that resembled those of minded creatures.<sup>49</sup> Reward and punishment are incentives for even single-celled organisms.<sup>50</sup> What we think of as pain or pleasure, punishment and rewards, correspond directly to states of living tissue during the process of homeostasis. Homeostasis is such a fundamental requirement that it affects everything that happens in our consciousness.<sup>51</sup>

Even organisms without consciousness, lacking brain and mind, like single-celled organisms, exhibit homeostasis, or life regulation.<sup>52</sup> If a single-celled organism without a brain, like an amoeba, needs food, it will “decide” to eat. It will go after food. Incentive molecules, hormones, and neuromodulators, engage a corrective chain of responses to threats and grade the urgency of response. But of course, a single-celled organism has no brain and no mind. We wouldn’t throw an amoeba in prison for going after a loaf of bread as Javert did to the

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<sup>49</sup> Antonio Damasio. 2012. *Self Comes to Mind: Constructing the Conscious Brain* 34. New York: Pantheon/Random House.

<sup>50</sup> *Id.* at 56.

<sup>51</sup> *Id.* at 27.

<sup>52</sup> *Id.* at 26.