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A Neurological Foundation for Freedom

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INTRODUCTION

¶1 Few people have read or watched the film adaptation of *The Diving Bell and the Butterfly* without proclaiming it a triumph of human will. Jean-Dominique Bauby authored the original memoir after suffering a major stroke that left him paralyzed from head to toe with minor exception, but with his mental capacities intact. He did so through a novel form of dictation. Slowly and repeatedly a transcriber recited a French language frequency-ordered alphabet, to which Bauby communicated his story through the blinks of his one working eye. When the transcriber reached the letter of the word Bauby wished transcribed, Bauby blinked once. He signaled the end of a word with two eye blinks, and used rapid eye blinks to communicate that the transcriber had guessed a letter or word ending incorrectly. Letter by letter, blink by blink, Bauby conveyed his thoughts to the transcriber. 200,000 blinks later, the story was done. His memoir provides in gripping detail the separability of the intention to act and the ability to effectuate intended actions. That Bauby could convey his thoughts through such extraordinary means is at once remarkable and tragic that anyone should suffer such a fate. Through the use of his one working eye, Bauby overcame, at least in a limited way, constraints on his freedom to act—by choosing to act, effectuating actions, and identifying with the actions he achieved.

¶2 Today, Bauby might have instead have used a revolutionary new technique from neuroscience to communicate his memoir. A technology known as brain-machine interface enables a computer to “read” brain activity and to decode it through pattern-recognition algorithms.¹ Cyberkinetics Neurotechnology Systems, Inc. has developed a brain-machine interface technology that connects the motor cortex of the brain to a computer, where the subject is able to move a cursor on the computer screen, check email, change the volume, and select or move anything on the screen that would be possible with cursor movements by simply *thinking* about hand movements.² So by

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¹ Gregory R. Peterson, *Imaging God: Cyborg, Brain-Machine Interfaces, and a More Human Future*, 44 DIALOG 337, 339 (2005).

² *Id.* at 337. Gel is applied to the user's hair or scalp to improve the conductivity of electrical signals from the brain, and a plastic cap is then placed over the head. Cables go from this cap to an electro-encephalograph machine (EEG), which is connected to a computer. Software in the computer interprets the electrical signals from the brain into vector components, mapping the brain

connecting Bauby to this brain-machine interface, he might have typed out his memoir himself by thinking about the letters of the words he wished to communicate. This essay illustrates how these advances support a robust theory of human freedom, which reifies existing theories of criminal responsibility.

¶3 Brain-machine interface has already extended beyond the two-dimensional world to the control of three-dimensional objects. Researchers at Duke University pioneered a study in which they connected electrodes to the motor cortex of a monkey's brain to interpret the electrical impulses arising from the firing of the neurons that signaled movement to the monkey's limbs. The researchers studied those electrical impulses to learn the neural process involved in moving the monkey's limbs. They then used this knowledge to build a brain-machine interface device to allow the monkey to manipulate a robotic arm through its thoughts. After training, the monkeys could manipulate the arm when it was connected directly to the monkey's brain such that the monkey ceased moving its own arm and instead moved the robotic arm to achieve its intended movement through intentional thought.³

¶4 The next step—human control of robotic arms by thought alone—has become reality. Tim Hemmes, a paraplegic by car accident, moved a robotic arm through brain-machine interface technology that decoded his intention to move the arm and translated it into three-dimensional action.⁴ With the help of a new type of chip that was implanted in his brain, Hemmes focused his deliberate intention on moving the three-dimensional arm and succeeded in doing so.⁵ To accomplish this feat, Hemmes had to undergo brain surgery whereby electrodes were implanted in his brain to record the electrical signals in his motor cortex brain region. Those electrical signals were connected to the robotic arm and after training for several weeks Hemmes could mentally achieve its movement.⁶

¶5 Despite these extraordinary advances that enable individuals to move three-dimensional objects through consciously willing those actions and the ability to now isolate the deliberate intentions in the brain, scholars continue to debate the existence of free will. Whether Bauby had used brain-machine interface to transcribe his memoir or used eye-blinks, a stronghold of scholars would challenge whether he acted freely. Not because Bauby suffered from the tragic and rare neurological condition called locked-in syndrome, characterized by the paralysis of all voluntary muscles except for those that control eye movement while leaving one conscious and able to think and reason. Rather, because such scholars question whether human actors have free will, or merely an illusion of freedom. Scholars who deem free will merely illusory claim that all events are determined by past events, including every event in the mind that one would call choice.

¶6 This essay illustrates why neuroscience supports a robust theory of human freedom. Rather than condemning humanity to a reductionist view of human actions, neuroscience provides a lens through which a long-standing debate about freedom of choice versus freedom of action can be renewed and resolved. Research investigations into the neural processes involved in preferences, desires, and human actions offer new insights into the flexibility and control that human actors exercise over voluntary actions.

¶7 Distinguishing between choice with respect to preferences and desires, and freedom to act in particular ways is consistent with a legal system that punishes for wrongful actions but not wrongful desires that are not acted upon. Yet legal scholars argue that the criminal justice system relies on a

patterns. Abstract mental tasks like “left, right, relax, cube, music,” which each produce a signal in a different area of the brain, are mapped, and this allows a user to select things like letters from a special software program and to type emails through their thought process and the machine interface. Brandon Mitchener, *Controlling a Computer by the Power of Thought—Disabled Could be Liberated by Brain-Wave Technology; Good Concentration Required*, WALL ST. J., Mar. 14, 2001, at B1.

³ Peterson, *supra* note 1, at 339.

⁴ Lauren Neegaard, *Paralyzed Man Uses Mind-Powered Robot Arm to Touch*, BusinessWeek (Oct. 10, 2011), available at <http://www.businessweek.com/ap/financialnews/D9Q96SH00.htm> (last accessed Oct. 21, 2011).

⁵ *Id.*

⁶ *Id.*

much thinner and consequentialist justification for individual responsibility than freedom of action.⁷ The prevailing concept of free will advanced by legal scholars is one that I call “legal free will.” Scholars of legal free will argue that the law does not need a metaphysical account of freedom, nor does it rely upon one for its legitimacy.⁸ This essay argues that rather instead of eschewing theoretical free for criminal responsibility, legal scholars could embrace advances in neuroscience to support a theory of freedom that focuses on voluntary actions.

¶8

Part I begins with a discussion of legal free will, a concept that appears most controversially in criminal law but also pervades most areas of law. Underpinning the attribution of responsibility in criminal law is a presumption that humans are free to act and to refrain from acting (“legal free will”). But legal free will is in fact a misnomer since the freedom it describes is a vacuous one. Scholars claim that the law holds individuals responsible for their actions not because they are free, but because it is expedient to treat them *as if* they are free. This leaves the legal system open to persistent attacks of its legitimacy for failing to comport with ordinary intuitions about moral responsibility. In criminal law in particular, legal free will creates a problem because its proponents disclaim any need to grapple with questions about moral responsibility. Because the power of the state and the threat to liberty is at its highest in the control of conduct deemed criminal, the refusal to grapple with questions of theoretical free will leaves the criminal justice system open to a never-ending slew of attacks. Part II illustrates the newest incarnation of these attacks, which have been rooted in neuroscience. Scholars are coalescing around the belief that neuroscience supports determinism and substantiates the claim that at the very least some individuals—if not all individuals—lack moral responsibility. Proponents of this view argue that the legal sanctions of the criminal justice system, such as blame, stigma, and shame, should therefore not follow. Part III then uses emerging studies in neuroscience to support a distinction between freedom of action and freedom with respect to our preferences and desires. This distinction matters, as Part IV argues that freedom of action offers a robust theory of freedom for attributions of responsibility.

I. LEGAL FREE WILL VERSUS THEORETICAL FREE WILL

¶9

Legal free will has been defended as a theoretically thin but sufficient basis for legal responsibility. Elsewhere, James E. Coleman, Jr. and I defined and set out the conflict between theoretical free will and legal free will.⁹ That discussion detailed how the present use and understanding of free will in criminal law—i.e. legal free will—does not depend upon conceptions derived from theoretical free will, “which encompasses the philosophical, metaphysical, psychiatric, and biological perspectives on this topic.”¹⁰ Our discussion explains that irrespective of the many factors influencing human behavior, criminal law—like other areas of law—presumes that individuals actively and consciously choose to engage in criminal conduct.¹¹ Not because they necessarily do, but because recognizing autonomy of human choice is fundamental to the operation of a modern system of laws.¹² Legal free will does not, therefore, codify a preference of one or more viewpoints from theoretical free will, but a preference for the belief that assumptions of freedom strengthen social systems and allow for the enforcement and creation of social norms.¹³ In essence, this social-

⁷ Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Everything and Nothing*, 359 PHIL. TRANSACTIONS ROYAL SOC'Y LONDON B 1775, 1779 (2004).

⁸ Stephen Morse, *The Non-Problem of Free Will in Forensic Psychiatry and Psychology*, 25 BEHAVIORAL SCI. & L. 203 (Mar./Apr. 2007) (arguing that free will or its lack is not a criterion for any legal doctrine nor does it underlie legal responsibility).

⁹ Nita A. Farahany & James E. Coleman, Jr., *Genetics and Responsibility: To Know the Criminal from the Crime*, 69 L. & CONTEMP. PROBS. 115, 135-38 (2006).

¹⁰ *Id.* at 135.

¹¹ HERBERT FINGARETTE, *THE MEANING OF CRIMINAL INSANITY* 72-73 (1972).

¹² *Cf.* United States v. Moore, 486 F.2d 1139, 1241 (D.C. Cir. 1973) (Wright, J., dissenting) (“[I]n determining responsibility for crime, the law assumes ‘free will’ and then recognizes known deviations ‘where there is broad consensus that free will does not exist’ with respect to the particular condition at issue.”) (quoting Salzman v. United States, 405 F.2d 358, 364 (D.C. Cir. 1969) (Wright, J., concurring)).

¹³ Farahany & Coleman, *supra* note 9, at 136-37.

regulation model allows that determinism may be true, but agents could nevertheless be influenced by the pressures and incentives created by social institutions like criminal law.¹⁴

¶10 Presumptions exist throughout the legal system, such as the presumption that ordinary citizens know the law and its requirements. The legitimacy of those presumptions depends in part upon their function. A presumption of legal free will does and should face greater scrutiny by moral philosophers than a presumption of knowledge of previous statutes or court rulings by legislative bodies when they enact new laws, because legal free will enables the assignment of blame and stigma, while the presumption of knowledge simply enables coherence in the adoption of new legislative enactments.

¶11 The philosophical attack on a retributivist system of criminal law is a simple one—if universal causation is true, then all actions are predetermined and a retributive attitude toward criminal conduct is unjustified.¹⁵ Vengeful attitudes like resentment and its expression through punishment would only be justified in such a regime if expressing vengeance had a utilitarian consequence of bringing about a better society.¹⁶ Otherwise, it seems arbitrary and unjust to assign blame to the actor instead of the chain of causation leading to the event.

¶12 Although I find a utilitarian model of criminal law persuasive and believe that social institutions can adopt assumptions that will motivate actors to behave responsibly, I nevertheless believe that criminal law scholars have given up too easily in the debate over retributivism.¹⁷ Instead of conceding the moral high ground to proponents of theoretical free will, legal free will and its presumption about the voluntariness of human actions comports with a more robust theory of freedom, one that neuroscience reifies rather than undermines. Grounding legal free will in freedom of action would give a stronger moral foundation to criminal responsibility. This theory of freedom—freedom of action—challenges the assumption that scientific progress inevitably leads to the view that human actions are constrained and that legal free will is a fiction devoid of meaningful content.

II. NEUROSCIENCE AND THE THEORETICAL FREE WILL DEBATE

¶13 Typical of all scientific progress, advances in neuroscience have focused on explaining larger natural phenomena by elementary constituent causes.¹⁸ The move from a holistic view of phenomena to a reductionist view seems at odds with attributing responsibility to individuals as integrated agents. Indeed, critics of legal free will use reductive claims to argue that the expanding knowledge about the causes of human behavior undermine any basis for claiming that humans act freely, which is a prerequisite for finding moral responsibility. These criticisms draw increasingly more prevalently from advances in neuroscience.¹⁹ In particular, proponents of materialism and determinism in the theoretical free will debate have incorporated neuroscience into their claims.

¶14 Materialism—the concept that “all events, including the operations of the mind, are ultimately operations of matter that obey[] the laws of physics”²⁰—has long drawn upon neuroscience for

¹⁴ John Martin Fischer & Mark Ravizza, *Introduction*, in PERSPECTIVES ON MORAL RESPONSIBILITY 1, 12 (John Martin Fischer & Mark Ravizza eds., 1993).

¹⁵ J.F. Johnston, Jr., *Human Freedom and the Limitations of Scientific Determinism*, 50 MODERN AGE 312, 319 (2008).

¹⁶ Fischer & Ravizza, *supra* note 14, at 6.

¹⁷ *See id.*; Richard C. Boldt, *Construction of Responsibility in the Criminal Law*, 140 U. PA. L. REV. 2245, 2304-05 (1992).

¹⁸ Johnston, *supra* note 15, at 313.

¹⁹ *See, e.g.*, WILLIAM R. CLARK & MICHAEL GRUNSTEIN, ARE WE HARDWIRED: THE ROLE OF GENES IN HUMAN BEHAVIOR 265 (2000) (asking whether free will actually exists and inquiring into the biological basis of free will); John L. Hill, Note, *Freedom, Determinism, and The Externalization of Responsibility in the Law: A Philosophical Analysis*, 76 GEO. L.J. 2045 (1998) (claiming that if determinism reflects reality, then the criminal law lacks coherence when it holds individuals criminally responsible); Marcia Johnson, *Genetic Technology and Its Impact on Culpability for Criminal Actions*, 46 CLEV. ST. L. REV. 443 (1998) (equating a genetic predisposition with genetic determinism and claiming that a defense based on a genetic predisposition negates free will and the elements of criminal responsibility); Note, *The XYY Syndrome: A Challenge to Our System of Criminal Responsibility*, 16 N.Y.L. SCH. L. REV. 232 (1970) (using the XYY syndrome to argue that the concept of criminal responsibility rests on flawed notions of free will).

²⁰ Greene & Cohen, *supra* note 7, at 1779.

support. Materialism has been described as akin to the wake of a boat going through the water.²¹ Just as the wake of the boat results purely from the boat moving through the water, so, too, argue materialists does the human mind result from material causes that precede it.²² As such, the mind follows from the interworking of the brain but the mind does not have a causal role in instantiating choice and action.²³ The brain causes muscle fibers to contract and neurons to fire, and is the root cause of mental activity, rather than some separate metaphysical mind.²⁴ Materialism is a rejection of a mind-body dualism, and of the role of independent metaphysical human agency. Instead, human action is seen as part of the material world and the series of causal events in the universe.

¶15 Determinism builds upon and relies upon materialism. Determinism postulates that past events combine with the laws of nature to determine future events.²⁵ Thus, the deterministic universe started out at time t_0 and has continued to evolve along an inevitable path governed solely by prior conditions in the universe and the laws of physics.²⁶ Hard determinists would argue that something as simple as a choice of coffee over tea was predetermined by the laws of physics and the state of the universe millions of years ago.

¶16 Determinists have incorporated neuroscience into the free will debate by arguing that the brain determines and enables the mind.²⁷ The brain is a physical thing subject to the rules of the physical world.²⁸ The physical world is determined; therefore, the brain must also be determined.²⁹ If the brain is determined and the brain enables the mind, thoughts and actions arising from the mind must also be determined occurrences rather than voluntary expressions of free will.³⁰

¶17 Both a descriptive, or soft/compatibilist view, and a prescriptive, or hard/incompatibilist, account have been offered for determinism.³¹ The descriptive view denies that the laws of nature compel human behavior in a morally significant sense; rather, the laws of nature merely describe the manner in which behavior arises.³² The descriptive view thereby allows for a core of human choice of one alternative over another alternative.³³ The prescriptive form views the laws of nature as compulsory on human behavior and therefore denies the existence of any free will.³⁴

¶18 The groundbreaking experiment conducted by Benjamin Libet in the early 1980s has significantly influenced both forms of the determinist movement.³⁵ Libet found that freely voluntary acts (such as raising a hand) are preceded by a specific electrical charge in the brain—called the readiness potential (“RP”)—beginning 550 milliseconds before the act.³⁶ Human subjects only become aware of intention to act 350-400 milliseconds after RP starts, or about 200 milliseconds before the actual motor act.³⁷ Thus, the volitional process of acting is preceded by neuronal activity outside of the

²¹ Quantum Physics and Free Will: A Misguided Concept, CHRISTIAN NEUROSCIENCE SOC’Y (Aug. 13, 2009), <http://cneuroscience.org/articles/quantum-physics-and-free-will>.

²² *Id.*

²³ Bram Bakker & Paul den Dulk, *Causal Relationships and Relationships Between Levels: The Modes of Description Perspective*, in PROCEEDINGS OF THE TWENTY-FIRST ANNUAL CONFERENCE OF THE COGNITIVE SCIENCE SOCIETY 43, 45 (Martin Hahn & Scott C. Stoness eds., 1999).

²⁴ *Id.*

²⁵ Johnston, *supra* note 15, at 312; Boldt, *supra* note 17, at 2255.

²⁶ Johnston, *supra* note 15, at 313.

²⁷ Michael S. Gazzaniga & Megan S. Steven, *Free Will in the Twenty-First Century: A Discussion of Neuroscience and the Law*, in NEUROSCIENCE AND THE LAW 51, 52 (Brent Garland ed., 2004).

²⁸ *Id.*

²⁹ *Id.*

³⁰ *Id.*

³¹ Boldt, *supra* note 17, at 2255.

³² *Id.*

³³ Johnston, *supra* note 15, at 313.

³⁴ Boldt, *supra* note 17, at 2255.

³⁵ See Benjamin Libet, *Do We Have Free Will?*, 6 J. CONSCIOUSNESS STUD. 47 (1999).

³⁶ *Id.* at 47.

³⁷ *Id.* Certain cognitive disorders, such as “alien hand syndrome” also support the negation of free will. Alien hand syndrome patients have a lesion in a fronto-medial portion of the premotor area of the brain. This defect causes the affected arm or hand to

conscious awareness of the individual. Determinists have seized upon this experiment to argue that neurological processes in the brain initiate action, followed by conscious awareness and a will to act. In other words, there is no room for an agent or conscious will to initiate actions based on a choice to act. The “brain” chooses and conscious awareness follows.

¶19 Modern psychologists and moral philosophers are joining the determinists’ bandwagon by using neuroscience as their new weapon of choice. A new form of moral reasoning is coalescing around neuroscience and biology to disclaim moral responsibility based on the biological correlates to human behavior.³⁸ In an influential article on the topic, Joshua Greene and Jonathan Cohen argue that as neuroscience offers more compelling mechanistic accounts of behavior, societies will come to view wrongdoers as mere “victims of neuronal circumstances.”³⁹ And when society comes to do so, the retribution-based model of criminal law will lose its legitimacy because it will fail to comport with the moral intuitions of society. Their claim has garnered substantial support and also spurred considerable debate on both sides of the issue.

¶20 Some scholars have launched persuasive counterarguments to Greene and Cohen. These scholars—the neuroskeptics—question the validity of the neuroscientific experiments at issue, arguing that consciousness might still cause intention.⁴⁰ Others question more generally the reduction of human behavior to neurological states.⁴¹ And “compatibilists” still hold their ground, arguing that determinism is compatible with free will, and that moral responsibility can exist in a determined universe. Susan Pockett notes that the classic compatibilist position centers on its definition of “free will.”⁴² When individuals act without external, and sometimes internal, constraint, they act freely—a person capable of accomplishing what he wills is responsible for his actions.⁴³ These commentators reject the incompatibilists’ search for “ultimate responsibility,” focusing instead on capacity to decide and act in accordance with will. Such capacity can exist even if consciousness does not cause intentions, so compatibilists find scientific evidence for that proposition irrelevant.⁴⁴ Gideon Yaffe, constructing a compatibilist account, describes two apparently distinct aspects of free will.⁴⁵ One kind of compatibilist freedom is self-expressive: we feel free when our actions express our wills, and unfree when they cannot.⁴⁶ Another type is self-transcendent: we feel free when we have rationally

perform “curious purposeful actions,” such as unbuttoning a shirt while the patient is attempting to button it, without or even against the patient’s intention or will. *Id.* at 49.

³⁸ See, e.g., Martha J. Farah, *Neuroethics: The Practical and the Philosophical*, 9 TRENDS COGNITIVE SCI. 34, 38 (2005) (“We naturally perceive [evidence of neurological dysfunction] as relevant to the defendant’s responsibility for his or her behavior This puts us on a slippery slope, however, once we recognize that that all behavior is 100% determined by brain function, which is in turn determined by the interplay of genes and experience.”); Michael S. Gazzaniga, *The Law and Neuroscience*, 60 NEURON 412, 413 (2008) (arguing that increasingly detailed descriptions of neurological activity tend to undercut retributivist theories of criminal punishment).

³⁹ Greene & Cohen, *supra* note 7, at 1781.

⁴⁰ See Andrea Lavazza & Mario De Caro, *Not So Fast. On Some Bold Neuroscientific Claims Concerning Human Agency*, 3 NEUROETHICS 23, 26-28 (2010) (arguing that experiments conducted by Soon, et al. could support any major philosophical theory of free will).

⁴¹ See, e.g., David Booth, *Psychobiosocial Muddle or Model?*, 17 SCI. & CHRISTIAN BELIEF 243 (2005) (alleging that neuroscience, psychology and the other social sciences play distinct roles in description and explanation of the mind); Michael S. Pardo & Dennis Patterson, *Philosophical Foundations of Law and Neuroscience*, 2010 U. ILL. L. REV. 1211 (2010) (arguing that properties of the mind are fundamentally defined by behavior, not by brain state; neuroscientific evidence may provide evidence of, for example, knowledge or intention, but phenomena in the brain will never constitute these properties); Stephen P.R. Rose, *Human Agency in the Neurocentric Age*, 6 EMBO REP. 1001 (2005) (arguing that many mental activities can be *described* in neuroscientific terms, but only *explained* by higher level social or behavioral sciences).

⁴² Susan Pockett, *The Concept of Free Will: Philosophy, Neuroscience and the Law*, 25 BEHAV. SCI. & L. 281, 284 (2007).

⁴³ *Id.*; see Gilberto Gomes, *Free Will, the Self and the Brain*, 25 BEHAV. SCI. & L. 221 (2007) (maintaining that compatibilism requires a change in the definition of responsibility—that an actor is free and responsible when, first, his action results from a conscious process of deciding, and second, he could have acted differently had he decided to).

⁴⁴ See e.g., Pockett, *supra* note 42.

⁴⁵ Gideon Yaffe, *Free Will and Agency at Its Best*, 14 PHIL. PERSP. 203 (2000).

⁴⁶ *Id.* Harry Frankfurt, considering situations in which people might be morally responsible when they could not have acted otherwise than they did, essentially embraces a self-expressive freedom: when one does what he means to, he can be responsible for his act even if he could not have acted differently. See Harry G. Frankfurt, *Alternate Possibilities and Moral Responsibility*, 66 J. PHIL. 829 (1969) [hereinafter Frankfurt, *Moral Responsibility*]. Frankfurt’s concern that free actors have some control over *what* they will reflects solicitude for self-transcendent freedom. See Harry G. Frankfurt, *Freedom of the Will and Concept of a Person*, 68 J. PHIL. 5 (1971) [hereinafter Frankfurt, *Freedom of the Will*] (arguing that one is free when his will reflects the desires that he prefers it to).

chosen the course of action that is objectively best.⁴⁷ These two accounts of freedom are potentially at odds, and Yaffe concludes that they are both merely factors that “appropriately situated judges” ought to weigh to decide whether an act was free.⁴⁸

¶21 An easy countermove to Greene and Cohen gives self-expressive freedom some moral significance. If one expresses himself through bad acts, he is bad. Tomis Kapitan offers an example of a professional torturer whose preferences and decisions are completely and secretly manipulated.⁴⁹ The man acknowledges that torture is wrong, but he continues at his job because he enjoys it. Reflecting a self-expressive conception of freedom, Kapitan argues that the torturer is, in fact, wicked—his wickedness may be engineered, and he may be a victim of his manipulators, but his moral character is still evil.⁵⁰ A concern about self-transcendent freedom, though, renders it impossible to hold the torturer morally accountable. At no point did he have the crucial capacity to refrain from his bad acts, so his manipulated decision to torture was not under his control, and he could not have been dissuaded by social reactions.⁵¹ Importantly, negative social reactions are “out of order” when a bad actor is unable to react to or modulate his behavior accordingly.⁵² Kapitan therefore limits moral responsibility to those situations in which social reactions can effectively control action. His argument illustrates that relying purely on control or contra-causal freedom—vital to self-transcendent freedom—tracks closely to the consequentialist argument that moral responsibility is appropriately ascribed only to those whom praise or blame could affect.⁵³

¶22 The most powerful version of the neuroskeptical approach comes from Stephen J. Morse who has argued that existing legal doctrine does and should stand unaffected by any metaphysical shifts that neuroscience might precipitate in the free will debate.⁵⁴ Morse argues against relying on free will in forensic thinking or decision-making. His argument begins by linking legal notions of responsibility to the efficacy of the law itself. The law presumes that people can, in general, conform their actions to its requirements; if they could not, the law would have no effect.⁵⁵ Because some situations exist in which the law categorically cannot be effective—for example, to deter the wholly irrational or those acting under threat of violence—criminal law incorporates excuses for insanity, necessity and duress.⁵⁶ Morse’s functional account of legal free will is quite compelling—since law *does* shift behavior, it seems absurd that it could be undermined by new revelations in neuroscience. And yet, his account also concedes the moral high ground to moral philosophers because Morse provides a purely consequentialist justification for criminal responsibility. Blameworthiness, stigma and moral approbation are legitimate only if a functional utilitarian purpose is served.

¶23 Neuroscience can and does do more than the neuroskeptics claim. It provides scientific grounding for a retributivist theory of legal responsibility. Neuroscience supports a theory of freedom that focuses on actions: Intentional and wrongful actions warrant societal response and condemnation because the actions arose from the choice to act, an effective action, and action with which the actor subjectively identifies and is objectively identified. Neuroscience identifies the individual as a blameworthy agent of action.

⁴⁷ See Yaffe, *supra* note 45, at 205.

⁴⁸ *Id.* at 223.

⁴⁹ Tomis Kapitan, *Autonomy and Manipulated Freedom*, 14 PHIL. PERSP. 81, 97 (2000).

⁵⁰ *Id.*

⁵¹ *Id.* at 98-99.

⁵² *Id.* at 98.

⁵³ See also Howard Rachlin, *Free Will from the Viewpoint of Teleological Behaviorism*, 25 BEHAV. SCI. & L. 235, 250 (2007) (arguing that it remains socially useful to distinguish between “natural vices” and “vices of self control”).

⁵⁴ Stephen J. Morse, *The Non-Problem of Free Will in Forensic Psychiatry and Psychology*, 25 BEHAV. SCI. & L. 203 (2007).

⁵⁵ *Id.* at 205.

⁵⁶ See Stephen J. Morse, *Rationality and Responsibility*, 74 S. CAL. L. REV. 251, 257-58 (2000).

III. FREEDOM OF ACTION VERSUS FREEDOM OF CHOICE

A. Rejecting Alternative Possibilities as a Precondition for Moral Responsibility

¶24 A common misconception that undoubtedly motivates scholars like Greene and Cohen is that the ability to act otherwise is a necessary precondition of moral responsibility. By using neuroscience to support a reductionist view of human actions, Greene and Cohen launch a general attack on legal free will by holding it nonsensical to treat individuals as morally responsible actors. A more specific attack focuses instead on the preconditions that must be met for an individual to be held responsible for the particular events he brings about.⁵⁷ The specific attack presumes that in some set of circumstances an actor has the capacity for moral responsibility, and asks instead the conditions that must pertain for responsibility to attach.

¶25 There is little that can be said to convince a prescriptive/hard determinist that there exists a set of circumstances under which an actor can be a morally responsible agent. The hard determinist believes that free will is entirely illusory. But one could still engage the descriptive/soft determinist, who sees the laws of nature as a description of the causal effects on human behavior, but allows for human capacity to distinguish between alternative possible actions. This view allows for the possibility that individuals can be morally responsible actors. Under some set of circumstances, an individual could be both a morally responsible actor and also satisfy a set of conditions to render him responsible for the events that he brought about. The soft determinist account therefore offers a starting point for engagement about a robust theory of legal free will that could justify moral responsibility. It embraces the materialist view that the mind is part of the physical world, but allows for the possibility that while preferences, desires, and other influences on human behavior may be fixed by prior circumstances, a free action may be exercised under a certain set of circumstances. The question is under what set of circumstances is a human action a free one, such that the actor could appropriately be deemed responsible?

¶26 Traditional moral philosophers argue that an actor is only responsible for bringing about an event if, with respect to a given act, he or she could have acted otherwise.⁵⁸ Another way of stating the same point is that contra-causal freedom is necessary for a person to be responsible for causing an event. C.A. Campbell helpfully framed it this way:

If we ask ourselves whether a certain person is morally responsible for a given act . . . we are considering . . . whether or not that person is a fit subject upon whom to pass moral judgment The really interesting and controversial question is about the *conditions* of moral responsibility, and in particular the question whether freedom of a contra-causal kind is among these conditions.

The answer of the common man to the latter question is that it most certainly *is* among the conditions . . . because he does not see how a person can be deemed morally praiseworthy or blameworthy in respect of an act which he could not help performing.⁵⁹

¶27 The hard determinist believes that contra-causal freedom cannot obtain. He argues that because all acts and events are predetermined by the preceding events, a person is not morally praiseworthy or blameworthy. But legal free will proponents need not grapple with the hard determinist on this point, because contra-causal freedom is not a necessary precondition for moral responsibility.

¶28 Through a series of hypothetical scenarios, Harry Frankfurt provided a powerful rejoinder to the traditional formulation of contra-causal freedom as a precondition of responsibility in his famous essay, *Alternate Possibilities and Moral Responsibility*.⁶⁰ Frankfurt demonstrated that a person who has had his choices and/or actions constrained so that a particular result will come about irrespective of

⁵⁷ See Fischer & Ravizza, *supra* note 14, at 6.

⁵⁸ Boldt, *supra* note 17, at 2254.

⁵⁹ C.A. Campbell, *Is "Freewill" a Pseudo-Problem?*, 60 MIND 441, 450-51 (1951).

⁶⁰ Frankfurt, *Moral Responsibility*, *supra* note 46, at 829.

those choices and/or actions still chooses to act in a morally irresponsible manner. Consider the following example: Person A desires to kill Person B and plans to do so. Unbeknownst to Person A, Person C also wants to ensure that Person B is killed, so Person C has created a fail-safe mechanism to ensure that Person B will be killed. Person C has rewired Person A's brain, such that if Person A should change his mind about killing Person B, the fail-safe mechanism will kick in and create both the desire in Person A to kill Person B and the series of neurological firings necessary for the action of Person A killing B. Person A therefore has no other option but to kill Person B. Under the precondition of contra-causal freedom, when Person A kills Person B he is not morally responsible for doing so because he lacks any alternative. Frankfurt, however, provided a new insight to this problem. He argued that while Person A lacks alternatives in one sense, in the moral sense, he does not. If Person A acts in response to his initial desire to kill B, and not in response to the fail-safe mechanism, we could still find him morally responsible for the action.⁶¹ Put otherwise, “[a] person may do something in circumstances that leave him no alternative to doing it, without these circumstances actually moving him or leading him to do it—without them playing any role, indeed, in bringing it about that he does what he does.”⁶² Through this proof, Frankfurt has offered the starting point for a more robust conception of legal free will.

B. Distinguishing Freedom of Action from Free Will

¶29 Freedom of action is a form of freedom, but freedom of action and free will are not synonymous. Freedom of action means the freedom of intending an action, being able to bring it about without obstacles or impediments, and identifying with the action that results. Free will is a broader concept encompassing both freedom of action and freedom of choice (herein used to describe freedom over one's preferences, desires and/or dispositions).⁶³ Frankfurt has described the difference as acting freely and acting with freedom of will.⁶⁴ One can conceive of the difference by simple illustration: One may have little to no control over their craving for chocolate cake. But that craving (freedom over preferences, desires and dispositions) is distinct from the action choices to purchase chocolate cake, to delve a fork into that cake, and to eat the chocolate cake (freedom of action). If a person acts in the manner he desires, moves with a will that is his own at a time, and identifies and is identified with that action, then he acts freely, irrespective of whether he has freedom over his preferences and predispositions.⁶⁵

¶30 Freedom of choice entails freedom with respect to the underlying contributions or causes of one's dispositions. Such freedom may in fact be illusory since disposition is shaped by many forces beyond individual control. But herein lies the confusion: Hard determinists have assumed that if one lacks control over their dispositions, they likewise lack control over their actions. This does not follow. If dispositions are determined but actions can in any sense be freely formed then one may act freely even with a constrained disposition. Building on Frankfurt's rejection of the principle of alternative possibilities—one might not be able to act otherwise, but so long as there are two pathways to action—one determined by disposition and one not determined by disposition—then constraints on freedom of choice do not eviscerate attributions of responsibility.

¶31 Because constraints on freedom of choice do not undermine freedom of action, assessments of moral responsibility can properly turn on whether an individual acted freely, rather than with whether they freely shaped their own preferences.⁶⁶ Consequently, attributions of responsibility turn not on whether an act was causally determined but whether, in an appropriate sense, the act was the agent's

⁶¹ *Id.* at 830-32.

⁶² *Id.* at 830.

⁶³ Eleonore Stump, *Intellect, Will, and the Principle of Alternate Possibilities*, in PERSPECTIVES ON MORAL RESPONSIBILITY, *supra* note 14, at 237, 242.

⁶⁴ *Id.*

⁶⁵ *Id.* at 244-45.

⁶⁶ Stump, *supra* note 66, at 242.

own.⁶⁷ This is because “what a person does is not relevant to moral evaluations of him merely because it is an indicator of his mental state. People merit praise or blame for what they do, and not just on the basis of what they do.”⁶⁸ Put simply, a person both is and should be held accountable for intending to take action in the world, acting in fact, and the consequences of those actions, not merely because of their motivation for acting as they did.⁶⁹

C. Using Brain-Machine Interface to Understand Freedom of Action

¶32 This brings us back to Tim Hemmes, the paraplegic whose experience helps to illustrate how modern neuroscience informs freedom of action. Modern techniques in neuroscience demonstrate that action choices are distinct choices with neural representations that can be detected and isolated. Those choices involve deliberate and focused agent-directed thought. After the new chip was implanted in Hemmes’s brain, moving the robotic arm was not as simple as Hemmes thinking, “I want to move my arm.” Instead, he had to discover how to form the specific intention to move the robotic arm and train for weeks to learn how to do so.⁷⁰ He began by training on moving a cursor around a screen, quickly discovering that thinking simple thoughts like “move up” or “move down” did not suffice to achieve the actions he desired. Instead, he had to learn a new language, a new way of translating his intention to act into three-dimensional actions.⁷¹

¶33 This technological feat makes plain the difference between dispositions (inability to move one’s arms, for example), intentions to act (deliberate thought processes), and performance of actions (achieving action desires in two or three-dimensional space). It allows a more sophisticated thought experiment that has scientific grounding—to isolate the willing of an action from the action itself. Action choices are distinct from two or three-dimensional action output in the world.

¶34 Hemmes had to learn to create effective brain states to move the robotic arm, making plain that conscious willing of an action is a necessary cause of an intentional actions. His training goes to the core of whether the brain alone controls actions, or whether some conscious “self” exercises control, choice and movement. Hemmes tried to simply let his “brain” figure out how to move his robotic arm.⁷² That approach failed, while Hemmes’s experience of consciously and deliberately training eventually resulted in effective brain states to signal the robotic arm causing the arm to move in accord with Hemmes’s intention.⁷³

¶35 Hemmes identified the resulting movement of the robotic arm as his own action. Brain-machine interface enables us to carry the thought experiment further—to isolate separately the intention to act, the action, and identification with the action. Freedom of action requires all three. Without proper identification with an action, a disjunction arises between the actor’s intention and the resulting action. Identification requires both subjective alignment by the actor with the resulting action and alignment by objective onlookers between the actor and the action. If an actor identifies with an action that an objective onlooker rejects as the actor’s own (e.g. because of facts known to the onlooker and unobservable by the actor), then attribution of responsibility is unwarranted. The disjunction undermines the presumption of the action as objective indicia of the actor’s subjective intent. And praise or blame would be misplaced upon an actor who does not properly identify or appreciate the action as his own.

⁶⁷ *Id.*

⁶⁸ Harry Frankfurt, *What We are Morally Responsible for*, in PERSPECTIVES ON MORAL RESPONSIBILITY, supra note 14, at 286, 291.

⁶⁹ *Id.*

⁷⁰ Lauren Neergaard, *Paralyzed Man Uses Mind-Powered Robot Arm To Touch*, SEATTLE PI (Oct. 10, 2011, 7:08 AM), <http://www.seattlepi.com/news/article/Paralyzed-man-uses-mind-powered-robot-arm-to-touch-2210762.php#ixzz1d02IEi00> (last visited Oct. 22, 2011).

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

¶36 Brain-machine interface illustrates how objective identification integrates actions with actors. Cyberkinetics, for example, is conducting clinical trials on the BrainGate Neural Interface System, which enables severely paralyzed individuals to communicate through a computer via a brain-machine interface.⁷⁴ The first subject, a fully paralyzed man, had a 100-electrode array implanted into his motor cortex that enabled him to operate a computer cursor on a television monitor through intentional thought.⁷⁵ The developers characterized the scientific breakthrough as a new mechanism enabling individuals to overcome obstacles in bringing about intentional actions. Their description identifies the patient as the agent exercising control of a cursor on a computer screen. The patient's action choices were separable and distinguishable through neuroscience from his resulting actions:

The patient was immediately able to send signals from this part of his brain in a controllable and meaningful fashion in response to directional commands even though he had not moved his arm in over three years due to a spinal cord injury. . . . A system has been developed to generate cursor control from these neural signals, enabling the patient to perform tasks and operate basic computer functions in numerous trials. The patient's control of the cursor was immediate and intuitive, and the patient was able to perform tasks while speaking and moving his head, without disruption.⁷⁶

D. Modern Neuroscience: A Rejoinder to Libet

¶37 Hemme's ignorance of the brain signals that accompanied his intention to move the robotic arm does not render his act of moving the robotic arm predetermined. When a paraplegic moves a wheelchair, a cursor on a computer screen, or a robotic arm by thinking about movement to effectuate those actions, he is usually unaware and lacks direct control over the neurological signaling pathways by which his intentions are physically instantiated. Those brain states, which include neuronal firing representing his intention to move his muscles or other objects, can be detected by the tiny sensor unfurled across the surface of the brain, which wirelessly communicates those signals to a base station.⁷⁷

¶38 But why must an actor know *how* something works to legitimately claim to have operated it? I do not, for example, know *how* words that I type on a computer keyboard are programmatically translated into words on the computer screen. Nor am I aware of the computer signals involved in launching the computer, the Microsoft Word application program, or in automatically saving my work in the background. All of this programming activity precedes and follows my typing on the computer and yet my unawareness of the computer programming involved does not then determine the words that I compose.

¶39 Scholars nevertheless continue to use Libet's work, which demonstrated that neural activity precedes conscious intention to act, to conflate mechanistic ignorance with causal determinism. Even if neural activity precedes awareness we are no closer to proving that the conscious intention to act is irrelevant in the causal history of an action.⁷⁸ Memory recall is similarly preceded by neural activity, which requires traversing related memories both temporally and spatially without awareness. It should come as no surprise that like computer programming, and memory retrieval, action choices will have subconscious activity that precede the intention to act.⁷⁹ Brain states and neural processes might include memories of actions that precede conscious awareness, or programming activity that

⁷⁴ Morgen E. Peck, *Standardizing the Brain-Machine Interface*, IEEE SPECTRUM ONLINE (April 2008), <http://www.spectrum.ieee.org/apr08/6105>.

⁷⁵ *Id.*

⁷⁶ Press Release, CyberKinetics Neurotechnology Systems, Six-Month Results of Cyberkinetics' BrainGate Neural Interface System Pilot Study Presented at AAP Meeting (April 24, 2005), *available at* http://www.neuroventures.com/news.html#_Six-Month_Results_of_Cyberkinetics'_1 (last visited February 15, 2009) (emphasis added).

⁷⁷ See David Derbyshire, *All in the Mind: The 'Telepathy' Chip that Lets You Turn on the TV Using the Power of Thought*, MAIL ONLINE (Sept. 3, 2009, 8:54 AM), <http://www.dailymail.co.uk/sciencetech/article-1210750/The-telepathy-chip-lets-control-computers-using-power-thought.html> (last visited Nov. 15, 2011).

⁷⁸ See David Booth, *Psychobiological Muddle or Model?*, 17 SCI. & CHRISTIAN BELIEF 243 (2005).

⁷⁹ *Id.* at 246.

prepares one to select between action choices, but prior brain states neither explain nor undermine the process of decision-making.⁸⁰

¶40 Recent studies on the flexibility of action selection cut in favor of freedom of action and against reading reductionism into Libet's studies. Contrary to the claim implicit from Libet's study that an initial event potential signaled by neural activity locks in a chain of events that follow, it appears that when choices are made freely, even among a limited set of options, alternative possibilities for action are kept viable and flexible through late stages of motor preparation.⁸¹ Stephen Fleming at the University College of London led a research team in the study of brain processes involved in free and instructed choice prior to initiating a physical action. The study participants were instructed to prepare either a left or a right key press (using their left or right index finger) or allowed to choose either option freely.⁸² Before initiating the key press, the participants received a second cue to either change or maintain their selected choice. Finally, they received a cue to act on their choice ("go") or to refrain from pressing a key ("stop"). The researchers measured the P300 event-related potential at each stage—prior to choice selection, during initial choice selection, when cued to stay or change their choice, and when asked to initiate or halt their action.⁸³ They found lower P300 amplitudes evoked by change cues in the free choice scenarios than by change cues in instructed choices scenarios,⁸⁴ revealing a difference between the neural processes involved in updating free choices versus instructed action choices. The team proposed that the research is at odds with the traditional view that choices are hardwired and determine future events:

[W]hen people freely choose between action alternatives, they do not in fact strongly commit to one action over another. In free selection, multiple possible action choices may be developed in parallel and may remain available until a late stage in the preparation process. These results are perhaps surprising given the traditional view that endogenous choices are both epistemologically and phenomenologically strong and incontrovertible.⁸⁵

What follows is a different reading of Libet's study. Rather than neurons making choices, the neuronal activity preceding choice may simply reflect keeping competing options available.

IV. FREEDOM OF ACTION AND RESPONSIBILITY

¶41 If emerging neuroscience supports freedom of action but not freedom over dispositions, and proponents of legal free will adopt freedom of action to justify retribution, then the debate should shift from whether actors are free to whether freedom of action justifies attributions of legal and moral responsibility. That alone would be significant progress for proponents of legal free will because they would be engaging the theoretical free will debate from within rather than as outsiders looking in. Such a move would comport with the voluntary act requirement in law. The law already requires that an actor have acted voluntarily before he can be held responsible for his actions. Freedom of action aligns with the voluntary act requirement and suggests that the real locus of freedom in law is the voluntary act requirement, not mental states or dispositions. This reading gives renewed meaning to the voluntary act requirement which otherwise has been poorly theorized, and it gives a stronger footing to retributivists who can instead argue that law embraces a robust theory of freedom based on voluntarily committing wrongful actions.

⁸⁰ *Id.*

⁸¹ Stephen M. Fleming et al., *When the Brain Changes Its Mind: Flexibility of Action Selection in Instructed and Free Choices*, 19 CEREBRAL CORTEX 2352, 2353 (2009).

⁸² Note that the use of "free choice" in this article may be at odds with the notion of free choice discussed by philosophers. Free choice in the Fleming article means that the study participant was given a set of two possibilities and asked to select between them. There was no incentive for choosing either alternative and no constraint on choosing either alternative.

⁸³ Fleming, *supra* note 81, at 2352-53.

⁸⁴ *Id.* at 2357-58.

⁸⁵ *Id.* at 2359 (citation omitted).

¶42 I believe that freedom of action *is* a sufficient basis for legal and moral responsibility.⁸⁶ Even if an actor's disposition or set of available desires could be accurately characterized as in some way constrained or determined.⁸⁷ David Hume and his intellectual heirs held that morally significant freedom arises from acting according to one's desires, to the extent that the action reflects the character of the individual, irrespective of the *origin* of one's desires.⁸⁸ By undermining the principle of alternative possibilities, Harry Frankfurt relieved us from finding that desires alone render a person irresponsible for his conduct. Coercion or influence does not vitiate moral responsibility. One can be morally responsible by choosing to act according to one's own desire to act, even if no other outcome would be possible. Coercion should factor into judgments of moral responsibility only when a person acts because he was coerced to do so, or the coercion accounts for his action.⁸⁹ Even if circumstances make it impossible for a person to avoid performing some action, when those circumstances did not bring about the action performed, the individual can and should be deemed morally blameworthy for the wrongful action.⁹⁰ When an actor intends to act, has volitional control and, and subjectively and objectively identifies with the action, he is acting with the freedom of action relevant for finding moral responsibility.⁹¹

¶43 Freedom of action also provides an alternative to scholars who otherwise resort to arguing that contra-causal action is possible to escape the universal causation debate.⁹² Freedom of action avoids this universal-causation-as-excuse conundrum by holding individuals responsible for wrongful actions when, somewhere in the matrix of causation, some process of reflection or valuation internal to the agent occurs.⁹³ This integrated view of human actors allows individuals to "own" their own mental process and thereby the freedom to engage in self-reflective activity.⁹⁴

¶44 Human beings, like most other animals, have desires and motives and are able to make choices that frequently satisfy these "first-order desires."⁹⁵ Human beings also have the capacity to form "second-order desires," or preferences among their first-order desires.⁹⁶ The characteristic that distinguishes persons from nonpersons is that persons frequently are able to make their second-order desires the basis upon which they wish to be moved to action. In Harry Frankfurt's terminology, the essential attribute of personhood is the presence of these "second-order volitions," which occur when the individual "wants . . . certain desire[s] to be his will."⁹⁷ Under this view, all that is required for moral responsibility is the ability to "act freely," or the ability to act according to one's second-order volition.⁹⁸

¶45 J. David Velleman provides a more nuanced description of free actions, consistent with the one described herein.⁹⁹ As he puts it, "[i]n a full-blooded action, an intention is formed by the agent himself, not by his reasons for acting."¹⁰⁰ In other words, reasons can affect an agent's intentions, but

⁸⁶ *Id.* Boldt, *supra* note 17, at 2255 (citing Campbell, *supra* note 59, at 125).

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ Frankfurt, *Moral Responsibility*, *supra* note 46, at 833.

⁹⁰ *Id.* at 837.

⁹¹ PHILLIP PETTIT, A THEORY OF FREEDOM: FROM THE PSYCHOLOGY TO THE POLITICS OF AGENCY 51 (2001).

⁹² Boldt, *supra* note 17, at 2261 (citing Roderick M. Chisholm, *The Agent As Cause*, in ACTION THEORY 199 (Myles Brand & Douglas Walton eds., 1976)); Roderick M. Chisholm, *Freedom and Action*, in FREEDOM AND DETERMINISM 11 (Keith Lehrer ed., 1966).

⁹³ Boldt, *supra* note 17, at 2261.

⁹⁴ *Id.*

⁹⁵ See Harry G. Frankfurt, *Freedom of the Will*, *supra* note 46, at 7.

⁹⁶ See *id.* at 10-11.

⁹⁷ *Id.* at 10.

⁹⁸ *Id.* at 18-19.

⁹⁹ See J. David Velleman, *What Happens When Someone Acts?*, in PERSPECTIVES ON MORAL RESPONSIBILITY, *supra* note 14, at 188.

¹⁰⁰ *Id.* at 189.

his intention doesn't move the limbs by itself—the agent has to both “form an intention under the influence of reasons for acting” and produces “behaviour pursuant to that intention.”¹⁰¹

¶46 Velleman's approach recognizes that mental states are connected to each other and to external behavior by causal chains. The agent in this view is a cause of action, rather than merely part of the causal chain where things happen to him and through him.¹⁰² The standard story by hard and soft determinists omits the agent in the chain of causation by failing to mention an intermediary role between desires and bodily movements played by the agent. Brain-machine interface allows us to conceptualize and thereby re-establish that link. With brain-machine interface, we can see that “[t]he agent, in his capacity as agent, is that party who is always behind, and never in front of, the lens of critical reflection, no matter where in the hierarchy of motives it turns.”¹⁰³ The only possibility for such a mental state would be a “motive that drives practical thought itself.”¹⁰⁴ Freedom of action, in accord with this view, recognizes that an agent acts in accord with his reasons for acting.¹⁰⁵ The desire of the individual to act in accordance with reason is “[w]hat really produces the bodily movements.”¹⁰⁶ Those bodily movements, together with the desire to cause those movements with which the actor identifies and is identified establish freedom of action. When an actor commits a wrongful act and does so with freedom of action, he is an agent for whom judgments of blame and responsibility are both appropriate and justified.

CONCLUSION

¶47 This essay seeks to shift the free will and neuroscience debate from whether neuroscience undermines free will to whether freedom of action is a sufficient precondition for legal and moral responsibility. Using brain-machine interface to illustrate the components of freedom of action—intending to act, acting, and identifying with an action—it shows how modern neuroscience supports rather than crumbles the foundation of legal free will.

¶48 Neuroscience provides a new lens to refocus and resolve the long-standing debate about freedom of choice and freedom of action. Research investigations into the neural processes involved in human actions offer new insights into the flexibility and control that human actors exercise over voluntary actions. When Jack Bauby blinked his eye or Tim Hemmes moved a robotic arm, each acted with freedom of action. Modern techniques in neuroscience now enable observers to “see” those intentions to act by detecting and decoding the underlying brain signals encoding them. Almost as easily as one can observe the two and three-dimensional actions achieved and identify those actions with the appropriate agent.

¶49 The legal system already punishes individuals for wrongful actions rather than just wrongful desires or dispositions. Despite this long-standing tenet in law, until now legal scholars have resorted to consequentialist justifications for legal free will believing either that a robust theory of freedom is unnecessary or indefensible. The traditional approach to legal free will perhaps arises from the fact that most scholars focus upon mental states as the locus of moral culpability. The time has come time to revisit the voluntary act requirement and its role in assignment of responsibility and in rebutting claims that the law lacks moral legitimacy in blaming actors for their wrongful conduct.

¶50 Freedom of action provides a stronger foundation upon which legal free will can rest to support a retributivist approach to legal responsibility. Agents act in accord with their reasons for acting, and intentions to act drive intentional and voluntary bodily actions. Only when the desire to act is manifested in an action does legal responsibility attach. Neuroscience illustrates the flexibility that individuals retain over their actions. And brain-machine interface allows us to detect and disaggregate

¹⁰¹ *Id.* at 190.

¹⁰² *Id.* at 195-96.

¹⁰³ *Id.*

¹⁰⁴ *Id.* at 206.

¹⁰⁵ *Id.* at 207.

¹⁰⁶ *Id.* at 208.

the component parts of free and voluntary actions. When a person acts with freedom of action, and the act is a legal wrongdoing, that person is an appropriate agent of blame and of moral and legal responsibility.