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Avoiding Irrational NeuroLaw Exuberance: A Plea for Neuromodesty

Stephen Morse
University of Pennsylvania, smorse@law.upenn.edu

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by Stephen J. Morse*

I. INTRODUCTION

In a 2002 editorial published in *The Economist*, the following warning was given: "Genetics may yet threaten privacy, kill autonomy, make society homogeneous and gut the concept of human nature. But neuroscience could do all of these things first."[1] The genome was fully sequenced in 2001, and there has not been one resulting major advance in therapeutic medicine since. Thus, even in its most natural applied domain–medicine–genetics has not had the far-reaching consequences that were envisioned.[2] The same has been true for various other sciences that were predicted to revolutionize the law, including behavioral psychology, sociology, psychodynamic psychology, and others. This will also be true of neuroscience, which is simply the newest science on the block. Neuroscience is not going to do the terrible things *The Economist* fears, at least not for the foreseeable future. Neuroscience

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* Ferdinand Wakeman Hubbell Professor of Law and Professor of Psychology and Law in Psychiatry, University of Pennsylvania. Diplomate, American Board of Professional Psychology (Forensic).

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1. *The Ethics of Brain Science: Open Your Mind*, ECONOMIST, May 23, 2002, at 77, *available at* http://www.economist.com/node/1143317/print.

2. *See, e.g.*, Robert Koenig, *Genome Scans: Impatient for the Payoff*, 342 SCIENCE 448 (2009); Nicholas Wade, *Genes Show Limited Value in Predicting Disease*, N.Y. TIMES, Apr. 16, 2009, at A1.

has many things to say but not nearly as much as people would hope, especially in relation to law. At most, in the near to intermediate term, neuroscience may make modest contributions to legal policy and case adjudication. Nonetheless, there has been irrational exuberance about the potential contribution of neuroscience, an issue I have addressed previously and referred to as "Brain Overclaim Syndrome."[3]

I first consider the law's motivation and the motivation of some advocates to turn to science to solve the very hard normative problems that law addresses. Part III discusses the law's psychology and its concepts of the person and responsibility. The next Part considers the general relation of neuroscience to law, which I characterize as the issue of "translation." Part V canvasses various distractions that have bedeviled clear thinking about the relation of scientific, causal accounts of behavior to responsibility. The following Part examines the limits of neurolaw and Part VII considers why neurolaw does not pose a genuinely radical challenge to the law's concepts of the person and responsibility. Part VIII makes a case for cautious optimism about the contribution neuroscience may make to law in the near and intermediate term. A brief conclusion follows.

II. SCIENCE AND LAW

Everyone understands that legal issues are normative, addressing how we should regulate our lives in a complex society. How do we live together? What are the duties we owe each other? For violation of those duties, when is the state justified in imposing the most afflictive–but sometimes justified–exercises of state power, criminal blame, and punishment?[4] When should we do this, to whom, and how much?

Virtually every legal issue is contested–consider criminal responsibility, for example–and there is always room for debate about policy, doctrine, and adjudication. In a recent book, Professor Robin Feldman has argued that law lacks the courage forthrightly to address the difficult normative issues that it faces.[5] The law therefore adopts what Feldman terms an "internalizing" and an "externalizing" strategy for using science to try to avoid the difficulties. In the internalizing strategy, the law adopts scientific criteria as legal criteria. A futuristic example might be using neural criteria for criminal responsibility. In

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3. *See* Stephen J. Morse, *Brain Overclaim Syndrome and Criminal Responsibility: A Diagnostic Note*, 3 OHIO ST. J. CRIM. L. 397 (2006).

4. *See, e.g.*, *In re* Winship, 397 U.S. 358, 364 (1970) (holding that criminal blame and punishment are such severe infringements that due process requires that conviction must be supported by proof beyond a reasonable doubt for every element of the crime).

5. *See generally* ROBIN FELDMAN, THE ROLE OF SCIENCE IN LAW (2009).

the externalizing strategy, the law turns to scientific or clinical experts to make the decision. An example would be using forensic clinicians to decide whether a criminal defendant is competent to stand trial and then simply rubberstamping the clinicians' opinion. Neither strategy is successful because each avoids facing the hard questions and impedes legal evolution and progress. Professor Feldman concludes, and I agree, that the law does not err by using science too little, as is commonly claimed. Rather, it errs by using it too much because the law is too insecure about its resources and capacities to do justice.

A fascinating question is why so many enthusiasts seem to have extravagant expectations about the contribution of neuroscience to law, especially criminal law. Here is my speculation about the source. Many people intensely dislike the concept and practice of retributive justice, thinking that they are prescientific and harsh. Their hope is that the new neuroscience will convince the law at last that determinism is true, no offender is genuinely responsible, and the only logical conclusion is that the law should adopt a consequentially-based prediction/prevention system of social control guided by the knowledge of the neuroscientist-kings who will finally have supplanted the platonic philosopher-kings.[6] On a more modest level, many advocates think that neuroscience may not revolutionize criminal justice, but neuroscience will demonstrate that many more offenders should be excused and do not deserve the harsh punishments imposed by the United States criminal justice system. Four decades ago, our criminal justice system would have been using psychodynamic psychology for the same purpose. More recently, genetics has been employed in a similar manner. The impulse, however, is clear: jettison desert, or at least mitigate judgments of desert. As will be shown in Parts V and VII, however, these advocates often adopt an untenable theory of mitigation or excuse that quickly collapses into the nihilistic conclusion that no one is really criminally responsible.

III. THE LAW'S PSYCHOLOGY, CONCEPT OF THE PERSON, AND RESPONSIBILITY

Criminal law presupposes a "folk-psychological" view of the person and behavior. This psychological theory explains behavior in part by mental states such as desires, beliefs, intentions, willings, and plans. Biological and other psychological and sociological variables also play a causal role, but folk psychology considers mental states fundamental to a full causal

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6. *See* Joshua Greene & Jonathan Cohen, *For the Law, Neuroscience Changes Nothing and Everything*, *in* LAW AND THE BRAIN 207, 217-18, 224 (Samir Zeki & Oliver Goodenough eds., 2006).

explanation and understanding of human action. Lawyers, philosophers, and scientists argue about the definitions of mental states and theories of action, but that does not undermine the general claim that mental states are fundamental. Indeed, the arguments and evidence disputants use to convince others presuppose the folk-psychological view of the person. Brains do not convince each other; people do. Folk psychology presupposes only that human action will at least be rationalizable by mental state explanations or will be responsive to reasons–including incentives–under the right conditions.

For example, the folk-psychological explanation for why you are reading this Article is, roughly, that you desire to understand the relation of neuroscience to criminal responsibility or to law generally. You believe that reading the Article will help fulfill that desire so you formed the intention to read it. This is a practical, rather than a deductive, syllogism.

Brief reflection should indicate that the law's psychology must be a folk-psychological theory, a view of the person as a conscious–and potentially self-conscious–creature who forms and acts on intentions that are the product of the person's other mental states. We are the sort of creatures who can act for and respond to reason. The law treats persons generally as intentional creatures and not simply as mechanistic forces of nature.

Law is primarily action-guiding and could not guide people directly and indirectly unless people could use rules as premises in their reasoning about how they should behave. Otherwise, law as an action-guiding system of rules would be useless (and perhaps incoherent). Legal rules are action-guiding primarily because these rules provide an agent with good moral or prudential reasons for forbearance or action. Human behavior can be modified by means other than influencing deliberation, and human beings do not always deliberate before they act. Nonetheless, the law presupposes folk psychology even when we most habitually follow the legal rules. Unless people are capable of understanding and then using legal rules to guide their conduct, the law is powerless to affect human behavior.

The legal view of the person does not hold that people must always reason or consistently behave rationally according to some pre-ordained, normative notion of rationality. Rather, the law's view is that people are capable of acting for reasons and are capable of minimal rationality according to predominantly conventional, socially constructed standards. The type of rationality the law requires is the ordinary person's common sense view of rationality, not the technical notion that might be acceptable within the disciplines of economics, philosophy, psychology, computer science, and the like.

Virtually everything for which agents deserve to be praised, blamed, rewarded, or punished is the product of mental causation and, in principle, is responsive to reason, including incentives. Machines may cause harm, but they cannot do wrong, and they cannot violate expectations about how people ought to live together. Machines do not deserve praise, blame, reward, punishment, concern, or respect because they exist or because of the results they cause. Only people, intentional agents with the potential to act, can do wrong and violate expectations of what they owe each other.

Many scientists and some philosophers of mind and action might consider folk psychology to be a primitive or prescientific view of human behavior. For the foreseeable future, however, the law will be based on the folk-psychological model of the person and behavior described. Until and unless scientific discoveries convince us that our view of ourselves is radically wrong, the basic explanatory apparatus of folk psychology will remain central. It is vital that we not lose sight of this model lest we fall into confusion when various claims based on neuroscience are made. If any science is to have appropriate influence on current law and legal decision-making, the science must be relevant to and translated into the law's folk-psychological framework (as shall be discussed in more detail in Part IV, below).

All of the law's doctrinal criteria for criminal responsibility are folk-psychological. Begin with the definitional criteria, the "elements" of crime. The "voluntary" act requirement is defined, roughly, as an *intentional* bodily movement–or omission in cases in which the person has a duty to act–done in a reasonably integrated state of consciousness. Other than crimes of strict liability, all crimes also require a culpable mental state, such as purpose, knowledge, or recklessness. All affirmative defenses of justification and excuse involve an inquiry into the person's mental state, such as the belief that self-defensive force was necessary or the lack of knowledge of right from wrong.

Our folk-psychological concepts of criminal responsibility follow logically from the action-guiding nature of law itself, from its folk-psychological concept of the person and action, and from the aim of achieving retributive justice, which holds that no one should be punished unless they deserve it and no more than they deserve. The general capacity for rationality is the primary condition for responsibility, and the lack of that capacity is the primary condition for excusing a person. If human beings were not rational creatures who could understand the good reasons for action and were not capable of conforming to legal requirements through intentional action or forbearance, the law could not adequately guide action and would not be just. Legally responsible agents are therefore people who have the general capacity to grasp and

be guided by good reason in particular legal contexts.[7] In cases of excuse, the agent who has done something wrong acts for a reason, but is either incapable of rationality generally or incapable on the specific occasion in question. This explains, for example, why young children and some people with mental disorders are not held responsible. The amount of lack of the capacity for rationality that is necessary to find the agent not responsible is a moral, social, political, and, ultimately, legal issue. It is not a scientific, medical, psychological, or psychiatric issue.

Compulsion or coercion is also an excusing condition. Literal compulsion exists when the person's bodily movement is a pure mechanism that is not rationalizable by the agent's desires, beliefs, and intentions. These cases defeat the requirement of a "voluntary act." For example, a tremor or spasm produced by a neurological disorder is not an action because it is not intentional and, therefore, defeats the ascription of a voluntary act. Metaphorical compulsion exists when an agent acts intentionally but in response to some hard choice imposed on the agent through no fault of his or her own. For example, if a miscreant holds a gun to an agent's head and threatens to kill her unless she kills another innocent person, it would be wrong to kill under these circumstances. Nevertheless, the law may decide as a normative matter to excuse the act of intentional killing because the agent was motivated by a threat so great that it would be supremely difficult for most citizens to resist. Cases involving internal compulsive states are more difficult to conceptualize because it is difficult to define and to assess "loss of control."[8] The cases that most fit this category are "disorders of desire," such as addictions and sexual disorders. The question is why these acting agents lack control, but other people with strong desires do not. If people frequently yield to their apparently very strong desires at great social, occupational, or legal cost to themselves, agents will often say they could not help themselves, they were not in control, and an excuse or mitigation was therefore warranted. But why mitigation or excuse should obtain is difficult to understand.

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7. I adapt the felicitous phrase "to grasp and be guided by good reason" from Jay Wallace. R. JAY WALLACE, RESPONSIBILITY AND THE MORAL SENTIMENTS 86 (1994).

8. Stephen J. Morse, *Uncontrollable Urges and Irrational People*, 88 VA. L. REV. 1025, 1035 (2002).

IV. LOST IN TRANSLATION? LEGAL RELEVANCE AND THE NEED FOR TRANSLATION

What in principle is the possible relation of neuroscience to law? We must begin with a distinction between internal relevance and external relevance. An internal contribution or critique accepts the general coherence and legitimacy of a set of legal doctrines, practices, or institutions and attempts to explain or alter them. For example, an internal contribution to criminal responsibility may suggest the need for doctrinal reform of, say, the insanity defense, but it would not suggest that the notion of criminal responsibility is itself incoherent or illegitimate. By contrast, an externally relevant critique suggests that the doctrines, practices, or institutions are incoherent, illegitimate, or unjustified. Because a radical, external critique has little possibility of success at present (as is explained in Part VII), this Part makes the simplifying assumption that the contributions of neuroscience will be internal and thus will need to be translated into the law's folk-psychological concepts.

The law's criteria for responsibility and competence are essentially behavioral–acts and mental states. The concepts and data of neuroscience are mechanistic–neural structure and function. Is the apparent chasm between those two types of discourse bridgeable? This is a familiar question in the field of mental health law,[9] but there is even greater dissonance in neurolaw. Psychiatry and psychology sometimes treat behavior mechanistically, sometimes treat it folk-psychologically, and sometimes blend the two. In many cases, the psychological sciences are quite close to folk psychology in approach. Neuroscience, in contrast, is purely mechanistic and eschews folk-psychological concepts and discourse. Thus, the gap will be harder to bridge.

The brain does enable the mind (even if we do not know how this occurs). Therefore, facts we learn about brains in general or about a specific brain in principle could provide useful information about mental states and about human capacities in general and in specific cases. Some believe that this conclusion is a category error.[10] This is a plausible view, and perhaps it is correct. If it is, then the whole subject of neurolaw is empty, and there was no point to writing this Article in the first place. Let us therefore bracket this pessimistic view and

9. *See, e.g.*, ALAN A. STONE, LAW, PSYCHIATRY, AND MORALITY 95-96 (1984).

10. *See, e.g.*, M.R. BENNETT & P.M.S. HACKER, PHILOSOPHICAL FOUNDATIONS OF NEUROSCIENCE 112, 270, 360, 381 (2003); Michael S. Pardo & Dennis Patterson, *Philosophical Foundations of Law and Neuroscience*, 2010 U. ILL. L. REV. 1211.

determine what follows from the more optimistic position that what we learn about the brain and nervous system can be potentially helpful to resolving questions of criminal responsibility if the findings are properly translated into the law's psychological framework.

The question is whether the new neuroscience is legally relevant because it makes a proposition about responsibility or competence more or less likely to be true. Any legal criterion must be established independently, and biological evidence must be translated into the criminal law's folk-psychological criteria. That is, the expert must be able to explain precisely how the neuroevidence bears on whether the agent acted, formed a required mens rea, or met the criteria for an excusing condition. If the evidence is not directly relevant, the expert should be able to explain the chain of inference from the indirect evidence to the law's criteria. At present, as Part VI explains, few such data exist, but neuroscience is advancing so rapidly that such data may exist in the near or medium term. Moreover, the argument is conceptual and does not depend on any particular neuroscience findings.

V. DANGEROUS DISTRACTIONS CONCERNING NEUROSCIENCE AND CRIMINAL RESPONSIBILITY AND COMPETENCE

This Part considers a number of related issues that are often thought to be relevant to criminal responsibility and competence, but that are irrelevant, confusing, and distracting: free will, causation as an excuse, causation as compulsion, prediction as an excuse, dualism, and the nonefficacy of mental states. Much of the legal exuberance about the contributions of neurolaw flow from these confusions and distractions so it is important to correct them. The legal exuberance also flows, however, from unrealistic expectations about the scientific accomplishments of neuroscience. Part VI of this Article addresses the scientific exuberance.

Contrary to what many people believe and what judges and others sometimes say, free will is not a legal criterion that is part of any doctrine, and it is not even foundational for criminal responsibility.[11] Criminal law doctrines are fully consistent with the truth of determinism or universal causation that allegedly undermines the foundations of responsibility. Even if determinism is true, some people act and some people do not. Some people form prohibited mental states and some do not. Some people are legally insane or act under duress when they commit crimes, but most defendants are not legally insane or acting

11. Stephen J. Morse, *The Non-Problem of Free Will in Forensic Psychiatry and Psychology*, 25 BEHAV. SCI. & L. 203, 204 (2007).

under duress. Moreover, these distinctions matter to moral and legal theories of responsibility and fairness that we have reason to endorse. Thus, law addresses problems genuinely related to responsibility, including consciousness, the formation of mental states such as intention and knowledge, the capacity for rationality, and compulsion. The law, however, never addresses the presence or absence of free will.

When most people use the term free will in the context of legal responsibility, they are typically using this term loosely as a synonym for the conclusion the defendant was or was not criminally responsible. They typically have reached this conclusion for reasons that do not involve free will–for example, that the defendant was legally insane or acted under duress–but such usage of free will only perpetuates misunderstanding and confusion. Once the legal criteria for excuse have been met–and no excuse includes lack of free will as a criterion–the defendant will be excused without any reference whatsoever to free will as an independent ground for excuse.

There is a genuine metaphysical problem about free will, which is whether human beings have the capacity to act uncaused by anything other than themselves and whether this capacity is a necessary foundation for holding anyone legally or morally accountable for criminal conduct. Philosophers and others have debated these issues in various forms for millennia and there is no resolution in sight. Indeed, some people might think the problem is not resolvable. This is a philosophical issue, but it is not a problem for the law, and neuroscience raises no new challenge to this conclusion. Solving the free will problem would have profound implications for responsibility doctrines and practices, such as blame and punishment, but having or lacking libertarian freedom is not a criterion of any civil or criminal law doctrine.

Neuroscience is simply the most recent mechanistic causal science that appears deterministically to explain behavior. Neuroscience thus joins social structural variables, behaviorism, genetics, and other scientific explanations that have also been deterministic explanations for behavior. In principle, however, neuroscience adds nothing new, even if neuroscience is a better, more persuasive science than some of its predecessors. No science, including neuroscience, can demonstrate that libertarian free will does or does not exist. As long as free will in the strong sense is not foundational for just blame and punishment and is not a criterion at the doctrinal level–which it is not–the truth of determinism or universal causation poses no threat to legal responsibility. Neuroscience may help shed light on folk-psychological excusing conditions, such as automatism or legal insanity, but the truth of determinism is not an excusing condition. The law will be fundamentally challenged only if neuroscience or any other science can conclusively demonstrate that the law's

psychology is wrong, and that we are not the type of creatures for whom mental states are causally effective. This is a different question from whether determinism undermines responsibility, however, and this Article returns to it below.

A related confusion is that behavior is excused if it is caused, but causation per se is not a legal or moral mitigating or excusing condition. I termed this confusion the "fundamental psycholegal error."[12] At most, causal explanations can only provide evidence concerning whether a genuine excusing condition, such as lack of rational capacity, was present. For example, suppose a life marked by poverty and abuse played a predisposing causal role in a defendant's criminal behavior or that an alleged new mental syndrome played a causal role in explaining criminal conduct. The claim is often made that such causes–which are not within the actor's capacity to control rationally–should be an excusing or mitigating position per se, but this claim is false.

All behavior is the product of the necessary and sufficient causal conditions without which the behavior would not have occurred, including brain causation, which is always part of the causal explanation for any behavior. If causation were an excusing condition per se, then no one would be responsible for any behavior. Some people might welcome such a conclusion and believe that responsibility is impossible, but this is not the legal and moral world we inhabit. The law holds most adults responsible for most of their conduct, and genuine excusing conditions are limited. Thus, unless the person's history or mental condition, for example, provides evidence of an existing excusing or mitigating condition, such as lack of rational capacity, there is no reason for excuse or mitigation.

Even a genuinely abnormal cause is not an excusing condition. For example, imagine a person with paranoid suspiciousness who constantly and hyper-vigilantly scans his environment for cues of an impending threat. Suppose our person with paranoia now spots a genuine threat that no normal person would have recognized and responds with proportionate defensive force. The paranoia played a causal role in explaining the behavior, but no excusing condition occurred. Indeed, the paranoid agent was "hyper-rational" for these purposes and would be justified. If the paranoia produced a delusional belief that an attack was imminent, then a genuine excuse, legal insanity–an irrationality-based defense–might be appropriate.

In short, a neuroscientific causal explanation for criminal conduct, like any other type of causal explanation, does not per se mitigate or excuse.

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12. Stephen J. Morse, *Culpability and Control*, 142 U. PA. L. REV. 1587, 1592-94 (1994).

It only provides evidence that might help the law resolve whether a genuine excuse existed, or it may in the future provide data that might be a guide to prophylactic or rehabilitative measures.

Compulsion is a genuine mitigating or excusing condition, but causation–including brain causation–is not the equivalent of compulsion. As we have seen, compulsion may be either literal or metaphorical and normative. It is crucial to recognize that most human action is not plausibly the result of either type of compulsion, but all human behavior is caused by its necessary and sufficient causes–including brain causation. Even abnormal causes are not necessarily compelling. To illustrate, suppose that a person has weak pedophilic urges and weak sexual urges in general. If this person molested a child there would be no ground for a compulsion excuse. If causation were the equivalent of compulsion, all behavior would be compelled and no one would be responsible. Once again, this is not a plausible account of the law's responsibility conditions. Causal information from neuroscience might help us resolve questions concerning whether legal compulsion existed, or it might be a guide to prophylactic or rehabilitative measures when dealing with plausible legal compulsion. Causation, however, is not per se compulsion.

Causal knowledge, whether from neuroscience or any other science, can enhance the accuracy of behavioral predictions, but predictability is also not a per se excusing or mitigating condition–even if the predictability of the behavior is perfect. To understand this, consider how many things we do that are perfectly predictable for which there is no plausible excusing or mitigating condition. Even if the explanatory variables that enhance prediction are abnormal, excuse or mitigation is warranted only if a genuine excusing or mitigating condition is present. For example, recent research demonstrates that a history of childhood abuse coupled with a specific, genetically-produced enzyme abnormality that produces a neurotransmitter deficit vastly increase the risk that a person will behave antisocially as an adolescent or young adult. A person is nine times more at risk if he has the monoamine oxidase A (MAOA) deficiency and a childhood abuse history.[13] Does this mean that an offender with this gene by environment interaction, is not responsible or less responsible? No. The offender may not be fully responsible or responsible at all, but not because there is a causal explanation. What is the intermediary excusing or mitigating principle? Are these people, for instance, more impulsive? Are they lacking

13. *See, e.g.*, Avshalom Caspi et al., *Role of Genotype in the Cycle of Violence in Maltreated Children*, 297 SCIENCE 851 (2002); Theodore Y. Blumoff, *Foreword: The Brain Sciences and Criminal Law Norms*, 62 MERCER L. REV. 705, 740-43 (2011).

rationality? What is the actual excusing or mitigating condition? Again, causation is not compulsion, and predictability is not an excuse. Just because an offender is caused to do something or is predictable does not mean the offender is compelled to do the crime charged or is otherwise not responsible. Brain causation–or any other kind of causation–does not mean we are automatons, not really acting agents at all, or otherwise excused.

Causal information may be of prophylactic or rehabilitative use for people affected, but no excuse or mitigation is applicable just because these variables make antisocial behavior far more predictable. If the variables that enhance prediction also produce a genuine excusing or mitigating condition, then excuse or mitigation is justified for the latter reason and independent of the prediction.

Most informed people are not "dualists" about the relation between the mind and the brain. That is, they no longer think that the mind–or soul–is independent of the brain and body and can somehow exert a causal influence over the body. It may seem as if law's emphasis on the importance of mental states as causing behavior is based on a prescientific, outmoded form of dualism, but this is not the case. Although the brain enables the mind, we have no idea how this occurs and have no idea how action is possible. It is clear that, at the least, mental states are dependent upon or supervene on brain states, but neither neuroscience nor any other science has demonstrated that mental states do not play an independent and partial causal role.

Despite our lack of understanding of the mind-brain-action relation, some scientists and philosophers question whether mental states have any causal effect, thus treating mental states as psychic appendixes that evolution has created but that have no genuine function. These claims are not strawpersons. They are made by serious, thoughtful people.[14] As discussed in Part VII below, if accepted, they would create a complete and revolutionary paradigm shift in the law of criminal responsibility and competence (and more widely). Thus, this claim is an external critique and must be understood as such. Moreover, given our current state of knowledge, there is little scientific or conceptual reason to accept it.[15]

In conclusion, legal actors concerned with criminal law policy, doctrine, and adjudication must always keep the folk-psychological view present in their minds when considering claims or evidence from neuroscience and must always question how the science is legally relevant to the law's

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14. *See, e.g.*, Greene & Cohen, *supra* note 6, at 217-18.

15. Stephen J. Morse, *Lost in Translation? An Essay on Law and Neuroscience*, *in* LAW AND NEUROSCIENCE 529, 543-54 (Michael Freeman ed., 2011).

action and mental states criteria. The truth of determinism, causation, and predictability do not in themselves answer any doctrinal or policy issue.

VI. THE LIMITS OF NEUROSCIENCE FOR LAW

Most generally, the relation between brain, mind, and action is one of the hardest problems in all of science. We have no idea how the brain enables the mind or how action is possible.[16] The brain-mind-action relation is a mystery. For example, we would like to know the difference between a neuromuscular spasm and intentionally moving one's arm in exactly the same way. The former is a purely mechanical motion, whereas the latter is an action, but we cannot explain the difference between the two. We know that a functioning brain is a necessary condition for having mental states and for acting. After all, if your brain is dead, you have no mental states, are not acting, and indeed are not doing much of anything at all. Still, we do not know how mental states and action are caused.

Despite the astonishing advances in neuroimaging and other neuroscientific methods, we still do not have sophisticated causal knowledge of how the brain works generally and we have little information that is legally relevant. This is unsurprising. The scientific problems are fearsomely difficult. Only in the last decade have researchers begun to accumulate much data from functional magnetic resonance imaging (fMRI), which is the technology that has generated most of the legal interest. Moreover, virtually no studies have been performed to address specifically legal questions.

Before turning to the specific reasons for neuromodesty, a few preliminary points of general applicability must be addressed. The first and most important is contained in the message of the prior Part. Causation by biological variables, including abnormal biological variables, does not per se create an excusing or mitigating condition. Any excusing condition must be established independently. The goal is always to translate the biological evidence into the criminal law's folk-psychological criteria.

Assessing criminal responsibility involves a retrospective evaluation of the defendant's mental states at the time of the crime. No criminal wears a portable scanner or other neurodetection device that provides a measurement at the time of the crime, at least not yet. Further, neuroscience is insufficiently developed to detect specific, legally relevant

16. PAUL R. MCHUGH & PHILLIP R. SLAVNEY, THE PERSPECTIVES OF PSYCHIATRY 11-12 (2d ed. 1998).

mental content or to provide a sufficiently accurate diagnostic marker for even a severe mental disorder.[17] Nonetheless, certain aspects of neural structure and function that bear on legally relevant capacities, such as the capacity for rationality and control, may be temporally stable in general or in individual cases. If they are, neuroevidence may permit a reasonably valid retrospective inference about the defendant's rational and control capacities and their impact on criminal behavior. This will of course depend on the existence of adequate science to do this. We now lack such science, but future research may remedy this.

Questions concerning competence or predictions of future behavior are based on a subject's present condition. Thus, the problems besetting the retrospective responsibility analysis do not apply to such questions. The criteria for competence are functional. They ask whether the subject can perform some task, such as understanding the nature of a criminal proceeding or understanding a treatment option that is offered, at a level the law considers normatively acceptable to warrant respecting the subject's choice and autonomy.

Now, let us begin consideration of the specific grounds for neuromodesty. At present, most neuroscience studies on human beings involve very small numbers of subjects, which makes establishing statistical significance difficult. Most of the studies have been done on college and university students, who are hardly a random sample of the population generally and of criminal offenders specifically. There is also a serious question of whether findings based on subjects' behavior and brain activity in a scanner would apply to real world situations. Further, most studies average the neurodata over the subjects, and the average finding may not accurately describe the brain structure or function of any actual subject in the study. Replications are few, which is especially important for law. Policy and adjudication should not be influenced by findings that are insuffiently established, and replications of findings are crucial to our confidence in a result. Finally, the neuroscience of cognition and interpersonal behavior is largely in its infancy and what is known is quite coarse-grained and correlational,

17. Allen Frances, *Whither DSM-V?*, 195 BRIT. J. PSYCHIATRY 391, 391 (2009). Many studies do find differences between patients with mental disorders and controls, but the differences are too small to be used diagnostically. *But see generally* John P.A. Ioannidis, *Excess Significance Bias in the Literature on Brain Volume Abnormalities*, ARCH. GEN. PSYCHIATRY, http://archpsyc.ama-assn.org/cgi/reprint/archgenpsychiatry.2001.28v1.pdf (claiming, based on a meta-analysis of studies of brain volume abnormalities in patients with mental disorders, that many more studies than should be expected found statistically significant results and that this can be best explained by bias in the reporting of the data).

rather than fine-grained and causal.[18] What is being investigated is an association between a task in the scanner and brain activity. These studies do not demonstrate that the brain activity is either a necessary, sufficient, or predisposing causal condition for the behavioral task that is being done in the scanner. Any language that suggests otherwise, such as claiming that some brain region is the neural substrate for the behavior, is simply not justifiable. Moreover, activity in the same region may be associated with diametrically opposed behavioral phenomena, such as love and hate.

There are also technical and research design difficulties. It takes many mathematical transformations to get from the raw fMRI data to the images of the brain that are increasingly familiar. Explaining these transformations is beyond me, but I do understand that the likelihood that an investigator will find a statistically significant result depends on how the researcher sets the threshold for significance. There is dispute about this, and the threshold levels are conventional. If the threshold changes, so does the outcome. I have been convinced by neuroscience colleagues that many such technical difficulties have been largely solved, but research design and potentially unjustified inferences from the studies are still an acute problem.[19] It is extraordinarily difficult to control all conceivable artifacts. Consequently, there are often problems of over-inference. Finally, it is also an open question whether accurate inferences or predictions about individuals are possible using group data when that group includes the individual. This is a very controversial topic, but even if it is difficult–or impossible–now, it may become easier in the future. Over time, however, these problems may ease as imaging and other techniques become less expensive and more accurate, research designs become more sophisticated, and the sophistication of the science increases generally.

Virtually all neuroscience studies of potential interest to the law involve some behavior that has already been identified as of interest, and the point of the study is to identify that behavior's neural correlates. Neuroscientists do not go on general "fishing" expeditions. There is usually some bit of behavior, such as addiction, schizophrenia, or impulsivity, that investigators would like to understand better by investigating its neural correlates. To do this properly presupposes that

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18. *See, e.g.*, Gregory A. Miller, *Mistreating Psychology in the Decades of the Brain*, 5 PERSP. PSYCHOL. SCI. 716 (2010) (providing a cautious, thorough overview of the scientific and practical problems facing cognitive and social neuroscience).

19. Professor Amanda Pustilnik's contribution to this Symposium also notes the reverse inference problem in the context of pain identification. *See, e.g.*, *The Brain Sciences in the Courtroom, A Symposium of the Mercer Law Review*, 62 MERCER L. REV. 769, 819 (2011).

the researchers have already identified and validated the behavior under neuroscientific investigation.

On occasion, the neuroscience might suggest that the behavior is not well-characterized or is neurally indistinguishable from other, seemingly different behavior. In general, however, the existence of legally relevant behavior will already be apparent. For example, some people are grossly out of touch with reality. If, as a result, they do not understand right from wrong, we excuse them because they lack such knowledge. We might learn a great deal about the neural correlates of such psychological abnormalities, but we already knew without neuroscientic data that these abnormalities existed, and we had a firm view of their normative significance. In the future, however, we may learn more about the causal link between the brain and behavior, and studies may be devised that are more directly legally relevant. I suspect that we are unlikely to make substantial progress with neural assessment of legally relevant mental content, but we are likely to learn more about capacities that will bear on excuse or mitigation.

The criteria for both responsibility and competence are behavioral; therefore, actions speak louder than images. This is a truism for all criminal responsibility and competence assessments. If the finding of any test or measurement of behavior is contradicted by actual behavioral evidence, then we must believe the behavioral evidence because it is more direct and probative of the law's behavioral criteria. For example, if the person behaves rationally in a wide variety of circumstances, the agent is rational even if the brain appears structurally or functionally abnormal. We confidently knew that some people were behaviorally abnormal, such as being psychotic, long before there were any psychological or neurological tests for such abnormalities.

An analogy from physical medicine may be instructive. Suppose someone complains about back pain, a subjective symptom, and the question is whether the subject actually does have back pain. We know that many people with abnormal spines do not experience back pain, and many people who complain of back pain have normal spines. If the person is claiming a disability and the spine looks dreadful, evidence that the person regularly exercises on a trampoline without difficulty indicates that there is no disability caused by back pain. If there is reason to suspect malingering, however, and there is not clear behavioral evidence of lack of pain, then a completely normal spine might be of use in deciding whether the claimant is malingering. Unless the correlation

between the image and the legally relevant behavior is very powerful, however, such evidence will be of limited help.[20]

If actions speak louder than images, however, what room is there for using neuroevidence? Let us begin with cases in which the behavioral evidence is clear and permits an equally clear inference about the defendant's mental state. For example, lay people may not know the technical term to apply to people who are manifestly out of touch with reality, but they will readily recognize this unfortunate condition. No further tests of any sort will be necessary to prove this. In such cases, neuroevidence will be at most convergent and increase our confidence in what we already had confidently concluded. Determining if it is worth collecting the neuroevidence will depend on whether the cost-benefit analysis justifies obtaining convergent evidence.

The most striking example of this type of case was *Roper v. Simmons*.[21] In *Roper*, the Supreme Court categorically excluded the death penalty for capital murderers who killed when they were sixteen or seventeen years old on the ground that adolescents do not deserve the death penalty.[22] The amicus briefs were replete with neuroscience data showing that the brains of late adolescents are not fully biologically mature, and advocates used this data to suggest that adolescent killers could not be fairly put to death.[23] Now, we already knew from common sense observation and from rigorous behavioral studies the Court cited that juveniles are on average less rational than adults. What did the neuroscientific evidence about the juvenile brain add? It was consistent with the undeniable behavioral data and perhaps provided a partial causal explanation of the behavioral differences. The neuroscience data was therefore merely additive and only indirectly relevant to the behavioral criteria for responsibility, and the Supreme Court did not cite it, except perhaps by implication.[24]

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20. Once again, Professor Pustilnik addresses the same issue. She concludes that although investigators are making progress in identifying neural correlates of pain, imaging data are not yet sufficiently diagnostic to reach firm conclusions about whether a subject is actually in pain. Pustilnik, *supra* note 19, at 822-25.

21. 543 U.S. 551 (2005).

22. *Id.* at 578-79.

23. *Id.* at 569.

24. *See id.* at 569, 573. The Supreme Court did refer generally to other science, but it was not clear if neuroscience played a specific role. *See id.* The Supreme Court did cite neuroscientific findings in *Graham v. Florida*, 130 S. Ct. 2011 (2010), which categorically excluded juveniles from life without the possibility of parole for non-homicide crimes. *Id.* at 2034. The citation was general, and I believe it was dictum. The Supreme Court was responding to an argument that no party had seriously made, which was that the science of adolescent development had changed significantly since *Roper* was decided. *Id.* at 2026-27.

Whether adolescents are sufficiently less rational on average than adults to exclude them categorically from the death penalty is of course a normative legal question and not a scientific or psychological question. Advocates claimed, however, that the neuroscience confirmed that adolescents are insufficiently responsible to be executed,[25] thus confusing the positive and the normative. The neuroscience evidence in no way independently confirms that adolescents are less responsible. If the behavioral differences between adolescents and adults were slight, it would not matter if their brains were quite different. Similarly, if the behavioral differences were sufficient for moral and constitutional differential treatment, then it would not matter if the brains were essentially indistinguishable.

If the behavioral data are not clear, then the potential contribution of neuroscience is large. Unfortunately, it is in just such cases that the neuroscience at present is not likely to be of much help. I term this the "clear cut" problem.[26] Recall that neuroscientific studies usually start with clear cases of well-characterized behavior. In such cases, the neural markers might be quite sensitive to the already clearly identified behaviors precisely because the behavior is so clear. Less clear behavior is simply not studied, or the overlap in data about less clear behavior is greater between experimental and control subjects. Thus, the neural markers of clear cases will provide little guidance to resolve behaviorally ambiguous cases of legally relevant behavior.

For example, suppose in an insanity defense case the question is whether the defendant suffers from a major mental disorder, such as schizophrenia. In extreme cases, the behavior will be clear, and no neurodata will be necessary. Investigators have discovered various small–but statistically significant–differences in neural structure or function between people who are clearly suffering from schizophrenia and those who are not.[27] Nonetheless, in a behaviorally unclear case, the overlap between data on the brains of people with schizophrenia and people without the disorder is so great that a scan is insufficiently sensitive to be used for diagnostic purposes.

Some people think that executive capacity–the congeries of cognitive and emotional capacities that help to plan and regulate human behavior–is going to be the Holy Grail to help the law determine an offender's true culpability. After all, there is an attractive moral case that people with a substantial lack of these capacities are less culpable,

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25. *Roper*, 543 U.S. at 569.

26. Morse, *supra* note 15, at 540.

27. On the other hand, there may be reason to be cautious about such findings. *See generally*, Ioannidis, *supra* note 17.

even if their conduct satisfied the prima facie case for the crime charged. Perhaps neuroscience can provide specific data previously unavailable to identify executive capacity differences more precisely.

There are two problems, however. First, significant problems with executive capacity are readily apparent without testing, and criminal law simply will not adopt fine-grained culpability criteria. Second, the correlation between neuropsychological tests of executive capacity and actual real world behavior is not terribly high.[28] Only a small fraction of the variance is accounted for, and the scanning studies will use the types of tasks the tests use. Consequently, we are far from able to use neuroscience accurately to assess non-obvious executive capacity differences that are valid in real-world contexts.

VII. ASSESSING THE RADICAL CLAIM THAT WE ARE NOT AGENTS

This Part addresses the claim and hope alluded to earlier that neuroscience will cause a paradigm shift in criminal responsibility by demonstrating that we are "merely victims of neuronal circumstances" (or some similar claim that denies human agency). This claim holds that we are not the kinds of intentional creatures we think we are.

If our mental states play no role in our behavior and are simply epiphenomenal, then traditional notions of responsibility based on mental states and on actions guided by mental states would be imperiled. But is the rich explanatory apparatus of intentionality simply a post hoc rationalization that the brains of hapless homo sapiens construct to explain what their brains have already done? Will the criminal justice system as we know it wither away as an outmoded relic of a prescientific and cruel age? If so, criminal law is not the only area of law in peril. What will be the fate of contracts, for example, when a biological machine that was formerly called a person claims that it should not be bound because it did not make a contract? The contract is also simply the outcome of various "neuronal circumstances."

Given how little we know about the brain-mind and brain-action connections, to claim that we should radically change our picture of ourselves, legal doctrines, and practices based on neuroscience is a form of neuroarrogance. Although I predict that we will see far more numerous attempts to introduce neuroevidence in the future, I have elsewhere argued that for conceptual and scientific reasons there is no

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28. *See, e.g.*, Russell A. Barkley & Kevin R. Murphy, *Impairment in Occupational Functioning and Adult ADHD: The Predictive Utility of Executive Function (EF) Ratings Versus EF Tests*, 25 ARCHIVES CLINICAL NEUROPSYCHOL. 157 (2010).

reason at present to believe that we are not agents.[29] It is possible that we are not agents, but the current science does not remotely demonstrate that this is true. The burden of persuasion is firmly on the proponents of the radical view.

What is more, the radical view entails no positive agenda. Suppose we were convinced by the mechanistic view that we are not intentional, rational agents after all.[30] What should we do now? We know that it is an illusion to think that our deliberations and intentions have any causal efficacy in the world. We also know, however, that we experience sensations, such as pleasure and pain, and care about what happens to us and to the world. We cannot just sit quietly and wait for our brains to activate, for determinism to happen. We must, and will, deliberate and act.

Even if we still thought that the radical view was correct and standard notions of genuine moral responsibility and desert were therefore impossible, we might still believe that the law would not necessarily have to give up the concept of incentives. Indeed, Greene and Cohen concede that we would have to keep punishing people for practical purposes.[31] Such an account would be consistent with "black box" accounts of economic incentives that simply depend on the relation between inputs and outputs without considering the mind as a mediator between the two. For those who believe that a thoroughly naturalized account of human behavior entails complete consequentialism, this conclusion might be welcomed.

On the other hand, this view seems to entail the same internal contradiction just explored. What is the nature of the agent that is discovering the laws governing how incentives shape behavior? Could understanding and providing incentives via social norms and legal rules simply be epiphenomenal interpretations of what the brain has already done? How do we decide which behaviors to reward or punish? What role does reason–a property of thoughts and agents, not a property of brains–play in this decision?

If the truth of pure mechanism is a premise in deciding what to do, this premise yields no particular moral, legal, or political conclusions.[32]

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29. Morse, *supra* note 15, at 543-54; Stephen J. Morse, *Determinism and the Death of Folk Psychology: Two Challenges to Responsibility from Neuroscience*, 9 MINN. J. L. SCI. & TECH. 1, 19-34 (2008).

30. Of course, the notion of being "convinced" would be an illusion too. Being convinced means that we are persuaded by evidence or argument, but a mechanism is not persuaded by anything. A mechanism is simply neurophysically transformed.

31. Greene & Cohen, *supra* note 6, at 218.

32. I was first prompted to this line of thought by a suggestion Mitch Berman made in the context of a discussion of determinism and normativity. Mitchell Berman, *Punishment*

It will provide no guide to how one should live or to how one should respond to the truth of reductive mechanism. Normativity depends on reason and, thus, the radical view is normatively inert. If reasons do not matter, then we have no reason to adopt any particular morals, politics, or legal rules, or to do anything at all.

Given what we know and have reason to do, the allegedly disappearing person remains fully visible and necessarily continues to act for good reasons, including the reasons currently to reject the radical view. We are not Pinocchios, and our brains are not Geppettos pulling the strings.

VIII. THE CASE FOR MODEST OPTIMISM

Despite having claimed that we should be exceptionally cautious about the current contributions neuroscience can make to criminal law policy, doctrine, and adjudication, I am modestly optimistic about the possibility of near and intermediate term contributions neuroscience can make to our ordinary, traditional, folk-psychological legal system. In other words, neuroscience may make a positive contribution even though there has been no paradigm shift in thinking about the nature of the person and the criteria for criminal responsibility. The legal regime to which neuroscience will contribute will continue to take people seriously as people–as autonomous agents who may fairly be blamed and punished based on their mental states and actions.

In general, the hope is that over time there will be feedback between the folk-psychological criteria and the neuroscientific data. Each might inform the other. Conceptual work on mental states might suggest new neuroscientific studies, for example, and the neuroscientific studies might help refine the folk-psychological categories. The ultimate goal would be a reflective, conceptual-empirical equilibrium. More specifically, there are four types of situations in which neuroscience may be of assistance: (1) data indicating that the folk psychological assumption underlying a legal rule is incorrect; (2) data suggesting the need for new or reformed legal doctrine; (3) evidence that helps adjudicate an individual case; and (4) data that help efficient adjudication or administration of criminal justice.

Many criminal law doctrines are based on folk psychological assumptions about behavior that may prove to be incorrect. If so, the doctrine should change. For example, it is commonly assumed that agents intend the natural and probable consequences of their actions. In many or most cases it seems that they do, but neuroscience may help in the future to demonstrate that this assumption is true far less frequently than we

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and Justification, 118 ETHICS 258, 271 n.34 (2008).

think. In that case, the rebuttable presumption used to help the prosecution prove intent should be softened or used with more caution.

Second, neuroscientific data may suggest the need for new or reformed legal doctrine. For example, control tests for legal insanity have been disfavored for some decades because they are ill understood and hard to assess. It is at present impossible to distinguish "can not" from "will not." Perhaps neuroscientific information will help to demonstrate and to assess the existence of control difficulties that are independent of cognitive incapacities. If so, then perhaps control tests are justified and can be rationally assessed after all. More generally, perhaps a significant number of offenders have such grave rational or control difficulties that they deserve a generic mitigation claim that is not available in criminal law today. Neuroscience might help us discover that fact. If that were true, justice would be served by adopting a generic mitigating doctrine. On the other hand, if it turns out that such difficulties are not so common, we could be more confident of the justice of current doctrine.

Third, neuroscience might provide data to help adjudicate individual cases. Consider the insanity defense again. As in *United States v. Hinckley*,[33] there is often dispute about whether a defendant claiming legal insanity suffered from a mental disorder, which disorder the defendant suffered from, and how severe the disorder was.[34] At present, these questions must be resolved entirely behaviorally, and there is often room for considerable disagreement about inferences drawn from the defendant's actions, including utterances. In the future, neuroscience might help resolve such questions if the clear cut problem difficulty can be solved. As mentioned previously, however, in the foreseeable future I doubt that neuroscience will be able to help identify the presence or absence of specific mens reas.

Finally, neuroscience might help us to implement current policy more efficiently. For example, the criminal justice system makes predictions about future dangerous behavior for purposes of bail, sentencing, including capital sentencing, and parole. If we have already decided that it is justified to use dangerousness predictions to make such decisions, it is hard to imagine a rational argument for doing it less accurately if we were in fact able to do it more accurately. Behavioral prediction techniques already exist. The question is whether neuroscientific variables can add value by increasing the accuracy of such predictions considering the cost of gathering such data. It is

33. 525 F. Supp. 1342 (D.D.C. 1981).
34. *Id.* at 1346.

perfectly plausible that in the future they may do so, and thus, prediction decisions will be more accurate and just.

IX. CONCLUSION

At present, neuroscience has little to contribute to more just and accurate criminal law decision-making concerning policy, doctrine, and individual case adjudication. This was the conclusion reached when I tentatively identified "brain overclaim syndrome" five years ago, and it remains true today. In the future, however, as the philosophies of mind and action and neuroscience mutually mature and inform each other, neuroscience will help us understand criminal behavior. Although no radical transformation of criminal justice is likely to occur, neuroscience can inform criminal justice as long as it is relevant to law and translated into the law's folk-psychological framework and criteria.