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Stephen J. Morse

University of Pennsylvania Carey Law School

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Is Executive Function The Universal Acid?

Stephen J. Morse

Introduction

Responsible Brains¹ presents a refreshing, neuroscience-based internal analysis of the criminal law and related fields. By “internally,” I refer to a contribution that largely accepts criminal law doctrines and practices as they are and does not succumb to the fevered speculations of so many that neuroscience will transform and even revolutionize criminal law. RB makes no such extravagant claims, which is most welcome. Instead, it uses the neuroscience of executive function to understand the contribution neuroscience allegedly can make to criminal law’s responsibility doctrines.

Here is RB’s central claim.

We think the pertinent question is not *whether* brain science can inform responsibility assessments, but in which sorts of cases, and to what extent. If facts about the brain bear on facts about the mind, the neuropsychological findings must in at least some cases inform assessment of defendants’ mental states, so long as we can link facts about brains to facts about the capacities necessary for responsible agency. All we need, it seems, is to determine which mental capacities are necessary to responsible agency, and which facts about brains are relevant to those capacities.²

Stated so modestly, who could disagree? Yet, RB does claim that executive functioning is the universal acid that best underpins and explains moral and legal responsibility generally and best accounts for specific doctrines and how they should be reformed without transforming criminal law generally. Moreover, RB argues that the neuroscience of executive function genuinely enhances understanding of these functions and can potentially assist in the adjudication of individual cases and doctrinal reform.

¹ W. Hirstein, K.L. Sifferd & T.K Fagan, *RESPONSIBLE BRAINS: NEUROSCIENCE, LAW, AND HUMAN CULPABILITY* (M.I.T. Press, 2018). Hereinafter, I shall refer to both the book and its authors interchangeably as, RB.

² RB, p. 9. Later, in the midst of RB’s central chapter on criminal responsibility, it adds the following:

The primary thesis of this book is that the folk and legal concepts underpinning the structure of criminal offenses and verdicts...implicitly refer to a particular set of cognitive functions that reside primarily in the prefrontal lobes of the brain and are understood by cognitive scientists as executive functions. RB, p. 85.

Michael Moore has similar aspirations for the neuroscience of executive functions, but is apparently less optimistic about current prospects:

The challenge to contemporary neuroscience is to gain detailed and reliable knowledge of the brain structures necessary for there to be executive control functions in persons....[T]he best way to answer that challenge would be by identifying tokens of brain states identical to tokens of intentions, desires and beliefs. Since that is not to be hoped for in the foreseeable future, the existence of *particular* disabilities on an occasion will have to be generated by *general* inabilities, and these latter might be identified by damaged or absent brain structures needed to possess such inabilities in general.

Michael S. Moore, *MECHANICAL CHOICES: THE RESPONSIBILITY OF THE HUMAN MACHINE* (Oxford University Press, 2020) at 365 (*italics in original*).

In contrast, this essay suggests that executive function is not the universal acid and the neuroscience at present contributes almost nothing to the necessary psychological level of explanation and analysis. To the extent neuroscience can be useful, it is virtually entirely dependent on well-validated psychology to correlate with the neuroscientific variables under investigation. The essay considers what executive function is and what the neuroscience adds to our understanding of it. Then it addresses moral and legal responsibility generally, and specific doctrines. Executive function is seldom found to be the most perspicuous approach to any of the general or specific moral and legal questions.

Executive Functioning

The modern concept of executive function was first seriously developed in the 1970s and the first person to use the label “executive” to refer to these psychological capacities was Pribram in 1973.³ Contemporary behavioral neuroscience (cognitive, affective and social) has largely been fueled by noninvasive functional magnetic resonance imaging (fMRI), which was discovered in 1991 and measures brain physiology.⁴ Although there were other techniques for such measurement, they were more invasive and not suitable for non-clinical subjects. fMRI has been the leading source of neuroscientific evidence concerning executive functioning. It was not until scanners (colloquially called “magnets” because they use high power magnetic fields to assess brain function) became commonly available at about the turn of this century that behavioral neuroscience studies were increasingly performed. Examination of the sources in RB confirms that virtually all post-date the new millennium. In short, the concept, measurement and study of executive function behaviorally antedates by decades neuroscientific investigation of this construct.

No consensus exists about the definition of executive function. All agree that it refers to a congeries of capacities or abilities that contribute to the agent’s ability to regulate his behavior. It is the term applied to abilities that enable purposive, goal-oriented, successful behavior.⁵ These include the capacities to initiate and plan behavior, to focus attention, and to self-monitor and self-regulate, including inhibition of inappropriate desires and actions. Defects in these functions, which usually stem from prefrontal cortex [PFC] deficiencies or malfunction, often are global and affect the person’s behavior generally. Not all functions need be impaired, however. The extent of impairment depends on the specific pathology involved. A person with such

³ S. Goldstein et al, *Introduction: A History of Executive Functioning as a Theoretical and Clinical Construct*, in S. Goldstein and J.A. Naglieri (eds.), *HANDBOOK OF EXECUTIVE FUNCTIONING*, DOI 10.1007/978-1-4614-8106-5_1, © Springer Science+Business Media New York 2014. The notion that people had “regulatory” or “control” functions goes back much further, most famously to the case of Phineas Gage.

⁴ Structural magnetic resonance imaging (MRI), which measures brain anatomy, was discovered in the late 1970s but has played a much lesser role in the development of contemporary behavioral neuroscience.

⁵ Jeffrey L. Cummings & Bruce L. Miller, *Conceptual and Clinical Aspects of the Frontal Lobes*, in *THE HUMAN FRONTAL LOBES: FUNCTIONS AND DISORDERS*, SECOND EDITION 12, 15-18 (JEFFREY L. CUMMINGS & BRUCE L. MILLER, EDS. 2007); JOAQUIN M. FUSTER, *THE PREFRONTAL CORTEX*, FOURTH EDITION 178ff. (2008); Joel H. Kramer & Lovingly Quitania, *Bedside Frontal Lobe Testing*, in. id. at 2279, 279-285; Muriel D. Lezak et al, *NEUROPSYCHOLOGICAL ASSESSMENT*, FOURTH EDITION 35-37 (2004). There is some variation among writers concerning the characterization of executive functions, but the description I will give is common and sufficient for our purposes.

defects may be excitable, impulsive, and erratic, or, in the alternative, avolitional, perseverating, and with flattened affect. Narrowly construed cognitive functioning may not be impaired, but, for example, the person's ability to use the intelligence and knowledge he possesses is diminished. These problems can impair the capacity for normal, independent life, including the ability to have successful interpersonal relations and to avoid inappropriate and unlawful behavior.

RB's candidates for inclusion in the set of executive functions are, attention, monitoring of perceptions, memories and emotions, monitoring of behavior, working memory, planning and goal setting, inhibition, and task switching. This is a perfectly good set of choices, especially because their categories are relatively broad, overlap, and seem to cover a vast array of self-regulatory abilities. And no one other than a substance dualist will deny that the brain somehow enables these mental-behavioral capacities although we have no idea how at present. RB spends a great deal of time comparing its view that executive control capacity is central to Neil Levy's "global workspace" view that actual consciousness is crucial to responsibility.⁶ This essay will not consider the comparison, but for what it's worth, I believe RB's account is more persuasive although it, too, does not persuade me.

One needs to be very cautious about what to infer from RB's review of the neuroscience associated with executive control. How the brain enables the mind and action, including mental actions such as exerting inhibitory control, is beyond our best scientific understanding.⁷ Most of what we know about the brain-mind-action connection based on neuroscientific studies is correlational, not causal.⁸ In other words, when hyperactivity or hypoactivity in the brain is associated with a task or condition, we don't know if the region of the brain with unusual activity is causally implicated in the task or condition or if it simply occurs simultaneously for reasons we don't understand. As a result, all language indicating causation, such as a region enabling or supporting task behavior, is loose talk. There is also a well-known replication crisis in social science, including behavioral neuroscience, and medicine. That is, many studies have not been repeated under the same or similar conditions. Different samples and methodologies may limit inferences from a body of work that seems to be investigating the same general domain. This difficulty is compounded because most behavioral neuroscience studies have small samples that reduce the power of their findings. In sum, when legal policy and adjudication are at stake that implicate real lives, we should want to be very sure of our conclusions before using the neuroscientific findings to make decisions. The neuroscience described in RB does not satisfy that standard.

⁶ Neil Levy, *CONSCIOUSNESS AND MORAL RESPONSIBILITY* (Oxford University Press, 2014). This view is also grounded in contemporary neuroscience.

⁷ Ralph Adolphs, "The unsolved problems of neuroscience," 4 *Trends in Cognitive Science* 173 (2015); Matthew Cobb, *THE IDEA OF THE BRAIN: THE PAST AND FUTURE OF NEUROSCIENCE* (Basic Books, 2020)

⁸ Gregory A. Miller, "Mistreating Psychology in the Decades of the Brain," 5 *Perspectives on Psychological Science* 716 (2010); Andrea L. Glenn & Adrian Raine, "Neurocriminology: implications for the punishment, prediction and prevention of criminal behaviour," *Nature Reviews: Neuroscience* 54 (2014).

Importantly for our purposes, behavioral neuroscience is largely dependent on psychology.⁹ Neuroscientists do not go on expensive fishing expeditions without knowing what they are hoping to catch. Instead, they have already identified some psychological or behavioral trait or condition, such as impulsivity, addiction or schizophrenia, that already interests them theoretically or practically. Such identification depends on those behavioral conditions already being well-characterized and operationalized. One cannot study schizophrenia neuroscientifically, for example, until behavioral criteria for the condition have already been developed using clear cases. Then one can compare the behaviorally clear cases structurally or functionally to a sample of people who do not have the trait or condition. Such a procedure optimizes the potential to find significant differences. Even then, there will tend to be significant overlap between the neurodata produced by the target and comparison groups. That is, many people with schizophrenia will have brains like those without and vice versa, even if there are significant differences between the means. This “clear cut” problem¹⁰ is so acute that one cannot use neuroscientific methods to accurately diagnose even the most severe and clear major mental disorders. In behaviorally less clear cases, the neurodata will be more unclear. When we need the neuroscience the most to decide behaviorally unclear cases, it will help us the least.

RB later concedes, as it did earlier, that current behavioral and neuroscientific tests are too coarse-grained or narrow to establish that an agent has sufficient executive function capacity for criminal responsibility. Nevertheless, it asserts that a collection of tests might be developed to measure executive functions, which are more precisely defined than current legal standards for responsibility, thus leading to more empirically reliable, accurate criminal verdicts and punishments. But this speculation would depend on first identifying normatively those behaviors that are necessary for responsibility. Moreover, the neurotests would have to be very tightly associated with the relevant behavior to be legally useful. Again, behavior precedes neuroscience. Ultimately, developing such tests will be an enormously difficult normative and empirical enterprise, and it is now well beyond our present abilities.

Not only is the neuroscience of executive function not sufficient to support RB’s case, it is not even necessary. It is usually impossible to prove a negative, but I contend that if all the neuroscience were removed from RB, no explanatory power would be lost. Because no sufficiently sensitive brain markers exist for executive function in behaviorally unclear cases, there isn’t even a pragmatic argument for the potential assistance of neuroscience for decision making. In cases in which the defect is arguably sufficient to warrant a conclusion concerning mitigation, excuse or incompetence, the behavioral evidence of executive dysfunction will typically be so manifest that no neuroscience evidence will be needed.¹¹ This explains why

⁹ Yael Niv, “The Primacy of behavioral research for understanding the brain,” in Adam J. Lerner, Samuel Cullen & Sarah-Jane Leslie, eds., *CURRENT CONTROVERSIES IN PHILOSOPHY OF COGNITIVE NEUROSCIENCE* (Routledge, 2020) at 134.

¹⁰ Stephen J. Morse, “Lost in Translation: An Essay on Law and Neuroscience,” in Michael Freeman, ed., *13 CURRENT LEGAL ISSUES 2010: LAW AND NEUROSCIENCE* (Oxford University Press, 2011) at 529, 540.

¹¹ See Lezak et al, note 5 supra, at 36 (“Many of the behavior problems arising from impaired executive functions are apparent even to casual or naïve observers.”)

even if closely-associated brain defects are discovered, the brain evidence will not be necessary to make the moral or legal assessment that depends on the agent's behavior.

Moral and Legal Responsibility

Before turning to RB's account, it is first necessary to clarify its metaphysical assumptions. As the introduction notes, RB is an internal analysis, but it is partially driven by its metaphysics. It assumes compatibilism, the causal theory of action, and reductive physicalism that treats brain states and mental states as identical.¹² Each of these three is philosophically controversial, but this essay will simply accept those assumptions as valid because the first two furnish the best positive groundwork for RB's internalist account and the latter is scarcely important to such an account. One accepts that physicalism is true unless one is a substance dualist, but whether one is a reductive or non-reductive physicalist does not matter to explaining human action if one accepts the causal theory of action as being enabled by the brain. As noted previously, we have essentially no idea how the brain enables the mind and action,¹³ but all physicalists must agree that it does. If you have no brain or it is dead, you have no mind and action is not possible.

Moral Responsibility

RB's moral responsibility analysis begins by assuming that assessments of desert are grounded in reactive attitudes, much as PF Strawson asserted. It is especially interested in

...cases where our reactive attitudes are influenced by facts about a person's mental states....That such cases exist suggests that our natural reactions take an agent's mind into account in producing the reactive attitudes....What seems to evoke them most strongly are cases where there is evidence that the target person intended or planned the action...As we will argue..., signs of executive activity can be evidence of both agential capacity and ill or good will....The more involved the executive is in producing an action, the greater the likelihood a person will be judged to be responsible for that action and its effects.¹⁴

It then assumes with many philosophers that the agent's cognitive capacities will be especially relevant and it adopts a reason-responsive compatibilist view of responsibility for action that is akin to Fischer and Ravizza's influential theory.¹⁵ RB accepts Fischer and Ravizza's moderately reason-responsive position that the agent is responsible if the mental mechanisms produced the action in the right way (hypotheticals involving nefarious neurosurgeons are not permitted). In brief passing, RB compares the reason-responsiveness theory to real self theories and rejects the latter as inferior. I agree with this conclusion but will say no more about this issue.

¹² RB claims that folk psychology is valid because its mental states and processes refer to underlying brain states and processes. P. 75

¹³ Note 8 supra.

¹⁴ RB, p. 46. Their theory also encompasses potential liability for unplanned, unintentional cases of risk creation.

¹⁵ J.M. Fischer and Mark Ravizza, *RESPONSIBILITY AND CONTROL: A THEORY OF MORAL AGENCY* (Cambridge University Press, 1998)/

RB seems to have a fondness for the intentional self-cultivation of good mental mechanisms and habits as a prerequisite for responsibility, but how many agents really engage in such behavior and is it really necessary? I think such cultivation is generally rare. Mostly, I claim, based only on my life experience, that we discover and accept how we are rather than producing our traits intentionally. I understand that the reflection and goal-directedness involved in self-cultivation are admirable (at least from a philosopher's viewpoint), but requiring this is too demanding for ordinary full responsibility. It is sufficient, I think, if an agent is capable of rationality at the time of the action. It is true that we can manipulate our environments to avoid our weaknesses or to enhance our strengths. This, too, is admirable and can lead to a more successful life, but it hardly seems necessary for responsibility unless one had a specific duty to cultivate a habit. But even if the agent did cultivate the right habit but forgot to exercise it on the occasion in question, the agent can still be fully responsible for omitting to act as he should have. In fact, RB's account accepts this broader view of responsibility as it addresses actual examples and cases, including the acceptance of negligence liability.

RB brings executive function more specifically into its theory by positing that an agent is responsible for an action or omission,

...if the person had a minimal working set of executive functions (MWS), and if the person's executive functions played the appropriate role in generating the action—or should have done so....¹⁶

RB asserts that the concept of MWS gives a “new and better” way to specify the capacities Fischer and Ravizza imply must be present for an agent to be moderately reason-responsive. The set must be minimal and there are many potential MWS styles, but attention, planning and inhibition tend to be the most important executive functions. Weaknesses in executive functions can be compensated for or remedied. RB summarizes the notion and role of MWS as follows:

...a person needs a certain level of executive function to be the subject of responsibility attributions, and that level of function must be achieved by the executive functions working together in an effective way. *Minimal working set* is ultimately a functional notion: It compiles a set of functions the person's brain must achieve in order for that person to effectively function in society.¹⁷

Assume for the purpose of argument that the behavioral capacities termed executive functions are the types of capacities that ground responsibility ascriptions. Assume further, as we must, that those capacities are dependent on the brain for their existence. This further assumption is simply an entailment of materialism or physicalism. What does the “brain talk” add to the plausible behavioral hypothesis? Either the agent has a sufficient MWS or not and that must be

¹⁶ RB, p. 54. MWS is later explained in more detail. Action or omission and the two criteria quoted are necessary but not sufficient for responsibility. Id. at 56. RB also says that situation and cultural factors may also partly determine responsibility, but this statement is obscure and never explained.

Notice that this account supports my suggestion that RB accepts a somewhat broader view of responsibility that does not require self or habit cultivation.

¹⁷ RB, p. 62.

determined behaviorally. Actions speak louder than neuroimages or other brain data. Just omit the word “brain” from the quote and no important meaning is lost.

Even without the “brain talk,” how much does the MWS really aid responsibility ascription? RB provides a series of examples to show how MWS plays an important role. One involves a driver who kills people in different ways. One is a premeditated, intentional slaughter of pedestrians (for no reason given). In another, the driver is distracted and driving an unfamiliar car and mistakes the gas pedal for the brake pedal, accelerating into the pedestrians rather than stopping the car. In the third, the driver has a seizure and runs the car into the pedestrians. RB rightly claims that there is more executive function at work in the first than in the second example (a risk creation case), and the third depends on the driver’s prior knowledge of the risk of seizures and whether the driver considered that history as he should have. Fair enough, but is this the most perspicuous way of addressing the differing degrees of responsibility. We already believe that doing something harmful on purpose (example 1) or with conscious awareness of risk (a possible variant of example 3) are worse than causing harm while unaware of risk because the former two show more disregard for the rights and interests of others, from which we infer ill-will. RB says that we expect people to put themselves in the right perceptual situation in order to perceive important things or emotions.¹⁸ How is this different from the hoary admonition to “stop, look and listen” when circumstances require that we do so? What does brain talk or executive function talk add? We can certainly assess how much executive function was at work for every instance of action and try to determine the neural correlates of such behavioral operations. This is an intellectually interesting exercise, but how much does it add to the enterprise of responsibility ascription that is central to our living together?

RB’s analysis of moral responsibility concludes with the following claim about the comparison of the executive function approach to competitors:

...our approach outperforms the competition by providing treatments of specific cases that are more sensible, more empirically testable, and more consistent with our existing folk psychology, reactive emotions, and legal apparatus.¹⁹

It claims further that its approach can inform institutional assessments by making clear what sorts of scientific evidence may be relevant to criminal responsibility. It makes similar claims when discussing criminal responsibility directly. I shall evaluate the validity of such claims after discussing RB’s theory of criminal responsibility.

Criminal Responsibility

Criminal law, like morality, custom, etiquette, social norms, and mores, is a system of rules we devise to guide our actions as interdependent, reason-responsive social creatures. The major difference is that enforcement of the criminal law rules is backed by the power of the state, which may blame, punish and stigmatize offenders. Punishment and stigma are in general the most afflictive exercise of state power, so much depends on which agents are responsible for

¹⁸ RB, p. 68

¹⁹ RB, p. 70 70.

harms they cause. RB's account adopts the same preliminary metaphysical assumptions noted at the beginning of this part of the essay. It also has the same structure as the analysis of moral responsibility although it recognizes that the overlap between moral and criminal responsibility is not perfect. At the core of criminal law, however, that is, those violations that involve force, fraud and theft and not simply regulatory offenses, there is general agreement that moral and legal responsibility do overlap.

RB introduces its discussion as follows:

Our goal...is to explore the folk psychological states and processes that underpin responsible action and to uncover the brain processes *behind* these mental states and processes...[T]he capacities needed to understand and behave in accordance with both moral and legal rules rest upon the same brain structures and functions.²⁰

Because RB argues that criminal punishment depends primarily on moral desert, the capacities for moral and criminal agency will overlap significantly. The use of the term "behind" for the role the brain will play in the analysis is ambiguous. It might refer to either causation or correlation. In either case, however, the question will be what the value-added of brain analysis will be, a question identical to that raised in the case of moral responsibility.

RB relies heavily on H.L.A. Hart's capacity concept of responsibility that holds agents accountable if they have the capacities to understand, reason and control conduct, that is, to understand what action moral and legal rules require, to deliberate and reach decisions concerning these requirements, and to conform to decisions when made.²¹ The agent must have the fair opportunity to exercise these capacities.²² Hart posited these commonsensical capacities before the modern concept of executive function was developed and long before the advent of fMRI research. RB notes, however, that Hart's higher-level capacities are "strikingly similar to executive processes." Of course they are. Both refer to how reason-responsive, rational, adaptive functioning occurs. The question as always is what brain and executive function analyses will add to Hart's common sense.

My only quibble with RB's account of criminal responsibility based on Hart is their claim that Hart adopts a volitional requirement for responsibility by positing the capacity to conform to decisions. This would entail that excuse or mitigation should obtain if this capacity is diminished without the agent's fault. Whether Hart really meant a genuinely independent volitional excuse is unclear. He never uses the word volition and the term is notoriously controversial in the philosophy of mind and action. The most extensive analysis in the legal literature is by Michael Moore, who claims that a volition is an executory intention that causes

²⁰ RB, pp. 72-73 (italics added).

²¹ RB, pp. 80-81, quoting H.L.A. Hart, PUNISHMENT AND RESPONSIBILITY: ESSAYS IN THE PHILOSOPHY OF LAW (Oxford University Press, 1968, at 227).

²² RB, p. 82. RB adopts the fair opportunity requirement of Hart and Brink and Nelkin, quoting David Brink & Dana Nelkin, "Fairness and the architecture of responsibility," in D. Shoemaker (ed.), OXFORD STUDIES IN AGENCY AND RESPONSIBILITY (Oxford University Press, 2013) at 284. But whether "fair opportunity" is an independent responsibility condition is questionable. Michael Moore thinks it is not and that it is simply one aspect of an independent control excuse. Michael S. Moore, MECHANICAL CHOICES, note 1 *supra*, 317-322.

distal intentions to ensue in action.²³ On Moore's account, otherwise apparently rational agents, such as pedophiles or addicts, who allegedly cannot control themselves, have no volitional problem whatsoever. They are able to act on their desires to touch children or to get high. To avoid this volitional thicket in philosophy, let us refer to the posited requirement as an independent control requirement and excuse.²⁴

The notion of control has many meanings that must be disaggregated. RB, Hart and virtually everyone agree that purely mechanical movements of one's body that are uncaused by intentions, such as reflexes, are not within an agent's control. They are not actions at all, and are literally out of control. The theoretically interesting cases are those in which mental states are part of the causes of bodily movements that cause harm. Let us begin with cases of divided, partial or dissociated consciousness, such as sleepwalking, in which the agent is clearly responsive to environmental cues and is seemingly goal-directed. I term these cases "actish" because viewed externally they appear very much like full-fledged actions. The dominant American doctrinal response is to consider them cases of no action, thus defeating the act requirement of the prima facie case for all crimes. RB apparently agrees, arguing that dissociated agents are not acting in accord with desires, beliefs and intentions produced by a cognitive system such that the action does not "belong" to the agent.²⁵ But this is not correct. Some sleepwalkers raid the refrigerator and some commit homicide. What sleepwalkers do has roots in their own psychology. The issue is whether responsibility is lacking and RB's explanation is unsatisfying. For example, I think a better explanation is that dissociation robs us of a crucial component of rational self-regulation, which is self-monitoring. On this view, dissociated agents act, but are excused because they lack rational capacity while dissociated.²⁶

Hart's view on actish cases is unclear and his position on an independent control requirement is less clear yet in cases involving normal consciousness. In the passage RB cites and in other relevant passages,²⁷ lack of self-control might mean one of four things: first, the inability to execute an intention formed to do the right thing; second, rapidly vacillating intentions, such that an intention to do the right thing is quickly superseded by an intention to do something wrong; third, the inability to bring reason to bear; and, finally, an independent lack of control excusing condition. The first seems rare and is not loss of control as RB means it. It seems more like a "no act" claim. The second is simply common human ambivalence or inconsistency. The third collapses into a cognitive problem. Hart's discussion of provocation leading to loss of self-control is instructive because it seems to be a problem of not being able to bring reason fully to bear on the occasion because, say, the agent is highly emotionally aroused. This interpretation is bolstered by Hart's coupling provocation cases with negligence cases as

²³ Michael S. Moore, *ACT AND CRIME: THE PHILOSOPHY OF ACTION AND ITS IMPLICATIONS FOR CRIMINAL LAW* (Clarendon Press, 1993) at 113-165.

²⁴ Professor Moore believes, however, that there should be an independent control excuse. Michael S. Moore, note 2 supra, at 313-372. Nevertheless, despite his account of volition, he inconsistently terms it a volitional excuse

²⁵ RB, p. 76. The scare quotes are in the original.

²⁶ E.g., Stephen J. Morse, "Culpability and Control," 142 *U. Penn. L.Rev.* 1587, 1641-1652 (also arguing against Moore's "no act" claim).

²⁷ Hart, note 21 supra, at 32-33, 152-153.

instances of failures to control oneself.²⁸ What provocation and negligence have in common is that the agent is not able to bring reason fully to bear because the agent is aroused or not aware of the risk being created. Hart is quite clear on the issue of proof problems, however. Questions involving control are much vaguer than those concerning muscular control or knowledge, so the law is more cautious about admitting evidence of defect of the will than defects of knowledge.²⁹

Given RB's heavy reliance on Hart, the necessity of an independent control condition is an important issue for RB's general account of criminal responsibility and for particular doctrines that will be discussed below. Hart does not provide one. I believe that at present we can neither conceptualize nor operationalize an independent control requirement.³⁰ Further, I claim that all cases that seem to require an independent control condition collapse easily into a rationality problem. To establish an independent control condition, a folk psychological institution such as criminal law needs a folk psychological process that is loss of control, but to the best of my knowledge, no one has successfully provided one although many have tried.³¹ The most valiant attempt was characteristically by Michael Moore, but I claim that his argument once again collapses into a rationality argument.³² RB needs a stronger case to argue convincingly that just criminal law requires an independent control condition.

RB summarizes its theory of criminal responsibility as a brain-based, reason responsive view that relies on executive functions to produce Hart's capacitarian criteria of reasoning, understanding and control of conduct. I have quibbled with the claim that a control test is necessary, but the account generally is good and traditional. The question raised in the discussion of moral responsibility arises again: is the claim that using executive function and the brain makes RB a superior theory of moral and criminal responsibility.

The Contribution of Executive Function and Neuroscience to Understanding Moral and Criminal Responsibility

I have agreed that executive functions are a more fine-grained means of specifying criminal responsibility criteria and that of course there must be brain structures and functions that are necessary for an agent to have a minimal working set of executive functions. RB's discussions of moral and criminal responsibility contain very little specific information about the role of executive functions and almost nothing about the brain that would be at all useful. RB admits that current behavioral and neuroscientific tests are insufficient to identify if a person has

²⁸ Id. at 153.

²⁹ Id. at 32-33.

³⁰ Morse, *supra* note 26, at 1610 ff; "Uncontrollable Urges and Irrational People," 88 *Virginia L. Rev.* 1025 (2002); "Against Control Tests for Criminal Responsibility," in P. Robinson et al (eds.), *CRIMINAL LAW CONVERSATIONS* (Oxford University Press, 2009) at 449-471 (including critical reviews of my original argument and my response to them).

³¹ My critics in "Against Control Tests," note 26 *supra*, scarcely try.

³² MECHANICAL CHOICES, note 2 *supra*, at 313-372. I criticized an earlier but essentially the same version of Moore's position in, "Moore on the Mind," in K.K. Ferzan & S.J. Morse (eds.), *LEGAL, MORAL, AND METAPHYSICAL TRUTHS: THE PHILOSOPHY OF MICHAEL S. MOORE* (Oxford University Press, 2016) at 233, 243-246.

a MWS, but suggests that a collection of tests that could do so might be developed in the future. But such tests would depend on first identifying, well-characterizing and operationalizing measures of the behavioral deficiencies that might compromise the presence of a MWS. A reliable and accurate empirical means for identifying the level of a person's capacity would be useful, but if the case is unclear, the "clear cut" problem will prevent the tests from being sufficiently sensitive and in those cases in which the defects are obvious, the tests will be relevant but superfluous. I conclude that RB's general accounts of moral and criminal responsibility do not indicate the practical or theoretical usefulness of either executive functions or especially its basis in brain structure and function. Although the relevance of executive functioning is clear, Hart is much closer to the ordinary person's way of understanding the capacity for responsibility. Much of RB is devoted to the analysis of specific legal doctrines. Perhaps these discussions will finally prove the worth of executive functions and neuroscience for creating more just legal doctrines and practices and for adjudicating individual cases of responsibility.

Specific Doctrines

RB discusses immaturity, dementia, legal insanity, diminished capacity, and punishment and sentencing theory more broadly. It also discusses the very specific cases of sleepwalking and the "unwilling" addict. The latter are discussed to prove the superiority of RB to Levy's theory, but I will use them only to discuss RB's approach. RB is rich in all these areas and addressing all in detail is impossible in the confines of this essay. I do hope to give sufficient evidence for my overall conclusion that the neuroscience is largely irrelevant and that characterizing responsibility in terms of executive functions is relevant but has little practical importance.

The Sleepwalking Killer

RB uses the famous case of *Parks*,³³ in which defendant Kenneth Parks drove about 12 miles to the home of his laws one evening while "sleeping," retrieved weapons from the car trunk and kitchen of his in-laws, and then killed one and attempted the murder of the other in their bedroom where they were sleeping. It was uncontradicted that Parks suffered from a sleep disorder and was indeed sleepwalking during this entire tragic episode. Parks was acquitted on grounds of "automatism," an outcome few dispute, but the question is why this was the just result. Despite his sleepwalking state, Park's behavior exhibited many aspects of executive functioning. He attended to his environment and carried out a number of intricate instrumental tasks to accomplish his homicidal result. He was not unconscious in the literal meaning of that term. RB says that he did not have a MWS and his actions did not have the right kind of executive engagement in their causal history.³⁴ Therefore his acts cannot be considered planned or intentional. In the sleepwalking state, "Things mainly just tend to happen, including 'our' own actions."³⁵ Also, RB says that Parks was not fully present because his executive processes were not available. His actions were caused by his conscious states, but they weren't fully *his*

³³ R v Parks, [1992] 2 S.C.R. 871.

³⁴ RB, p. 143

³⁵ Ibid (scare quotes in original).

conscious states.³⁶ At this stage, the reader understands what RB means, but is this the most perspicuous explanation for excusing Parks?

What Parks did of course arose from within his own psyche. It was not a random sleepwalk that could have as well ended in his own kitchen with leftovers as in his in-laws' bedroom. RB emphasizes that Parks was not "there," but this seems incorrect. Even if Parks fully believes that he should have been rightfully acquitted, he still must acknowledge to himself that he did kill people rather than raid the refrigerator. He was dissociated, however. Through no fault of his own, he had lost the ability to monitor himself, the ability we all fundamentally use to guide our own behavior. In a sense, he wasn't watching himself when he did his horrible deeds and thus could not bring good reason to bear. He wasn't aware of what he was doing. American jurisdictions treat such cases as "no action," although some treat it as excused action. In either case, the doctrine is explained on similar grounds. The agent is not responsible either for not acting or for acting with excuse because he could not reason at the time. This is a much simpler and equally explanatory account to RB's complex executive function theory of why sufficiently dissociated agents should be excused.

In the case of Parks himself, his neurological findings were consistent with his claim that he was sleepwalking because they were associated with a sleep disorder. But the brain findings were the old neurology, not the new neuroscience. Moreover, RB attributes acquittal to common sense behavioral factors other than the brain findings, such as his lack of a motive (his seeming good will towards his in-laws), his consistency and truthfulness throughout the trial.

The Unwilling Addict

RB claims that it is wrong to say that the heroin addict who says that he condemns his own habit and has tried ceaselessly but fruitlessly to quit using "wants" heroin. It claims without argument that he doesn't want, but instead craves heroin and the cravings are not really *his*. Further, actions taken without executive approval are not *our* actions.³⁷ This seems clearly incorrect once again. Human beings are often deeply ambivalent about their bad habits, wanting to be rid of them but also wanting to continue the benefits (e.g., positive pleasure, avoidance of pain) that maintaining the habit provides. Unless the addict is willfully deluded, however, the addict knows that his desire for drugs is his desire and that satisfying it is his action. The addict is no different in this regard than the unwilling nail-biter or gambler. Now, addiction specialists often talk about the substance usurping, or more colorfully, hijacking the brain's natural reward system, but all bad habits do and there is nothing special about a substance as the source of the bad habit. Many addiction specialists also say that addicts can't control their persistent seeking and using drugs, but this claim rests on a series of conceptual and empirical confusions and mistakes.³⁸

³⁶ RB, p. 148 (italics in original).

³⁷ RB, pp. 150-151 (italics in original). The final statement refers to alien hand cases, but it is meant to apply to unwilling addicts.

³⁸ Brief of *Amici Curiae* 11 Addiction Experts in Support of Appellee, Commonwealth v. Julie Eldred, Massachusetts Supreme Judicial Court, SJC-12279 (2017). Such brain-based addiction excuse cases are beginning

RB does say that as the strength of the addiction grows, the addict becomes less sensitive to the reasons to refrain and finds it consequently harder to inhibit drug use.³⁹ I think that this is largely correct when the addict is in a stage of peak desire as the effects of prior use wear off. This is a classic cognitive problem that can be understood without the substructure of executive function. At the moment of using the addict may not be sufficiently reason-responsive, but when the addict is quiescent, reasoning ability is intact. On RB's on theory of diachronous responsibility, the allegedly unwilling addict is really an ambivalent addict who had it within his power to take steps to prevent further use.

Juvenile Justice

RB correctly notes that our society is ambivalent about juvenile blame and punishment. We know that adolescents are developmentally immature and characteristically impulsive but such characteristics are normal for the developmental era they are in and most will grow out of it. Some adolescents live in circumstances of poverty, violence and the like, which increases the likelihood of developmental problems. Therefore, such defendants appear to be less blameworthy and should be treated accordingly. On the other hand, some adolescent offenders seem fully mature, seem to deserve adult punishment, and are highly dangerous to society. This is completely acceptable when there are overlaps in behavior between later adolescents and younger adults. RB claims that we lack but need "a scientifically sound and philosophically correct account of how the capacities necessary for responsible action develop during childhood and adolescence."⁴⁰ With all due respect, estimable scholars such as Elizabeth Scott and Larry Steinberg and a host of others, many of whom RB cites, have been doing this for quite a long time. The immaturity excuse has been a feature of Anglo-American criminal law for over half a millennium and the juvenile court was first established in the 19th Century. Adding something new that will be theoretically interesting and scientifically original is therefore a tall order.

Ample developmental psychology has long established that the executive functions mature throughout adolescence but at differing rates. Moreover, the process does not seem complete until people are into what we now term young adulthood. On average, adolescents simply are more inclined to be impulsive, to take risks, to be responsive to peer pressure, and they have less well-established character traits. RB sums up the behavioral differences as follows:

Children and adolescents are not simply "weaker" versions of adult moral agents, as if they merely had a less developed ability to express a fully formed character through their actions. Rather, their executive immaturity puts them at increased risk of having their agency compromised, broken up, hijacked or bypassed altogether.⁴¹

With all due respect what does this add, even if accurate, to the summary that precedes the quote. Moreover, it is not clear that it is accurate. Is the agency of adolescents compromised or is it

to proliferate, but science no more supports such an excuse than it did when the Supreme Court rejected such an excuse in *Powell v. Texas*, 392 U. S. 514 (1968) (Justice Marshall wrote the plurality opinion).

³⁹ RB, p. 152.

⁴⁰ RB, p. 160.

⁴¹ RB, p. 168 (quotes in original).

simply that they make less wise choices because they are less predisposed than adults to bring reason fully to bear. Which is the more compelling, less metaphorical way of understanding they adolescents are generally given a legal break?

RB also argues, again echoing Hart's notion of capacity-responsibility, that "because we can identify the gradual development toward an MWS in the maturing brain,"⁴² we should apply a scalar concept of responsibility to juveniles. This is a perfectly plausible proposal, but the alleged role of the brain in a non-sequitur. An MWS is a set of behavioral functions that of course have neural causes and correlates, but how the behavior changes over time and the moral and legal implications of those changes depends on our normative view of the behavior, not on the associated brain changes. RB does admirably resist, however, the notion that the scale is simplistically tied solely to changes in executive function. It focuses on the juveniles widening experience over time in interaction with increasing executive function that permit more effective use of executive functions and on the increasing range of reasons that become salient to adolescents as they mature. Once again, this is behavioral analysis.

RB concludes its discussion of juvenile responsibility by making a specific proposal for a graded structure of responsibility that is considerably more forgiving to adolescents and young adults than the present, dominant approach. They note that the law often needs bright line rules for equality and convenience, but this is inevitably in tension "with the gradual and individually variable nature of neurobiological maturation," the "wide disparities between individual juveniles when it comes to executive maturity."⁴³ I do not like the proposal because I think it is too forgiving and it is not entailed by the neuroscience and behavioral findings that RB presents. It is not inconsistent with the empirical evidence, but a less permissive scheme would also not be inconsistent. More central to the central thrust of this essay, however, is that the proposal is effectively based entirely on behavioral analysis despite the apparently obligatory invocations of brain maturation.

Many advocates for more forgiving treatment for adolescents and young adults believe that newer understanding of brain maturation "changes everything." This is a classic example of what Francis Shen terms, "lobbyist neuroscience," in which advocates use science more aggressively and categorically for their purposes than the evidence warrants.⁴⁴ RB invokes the brain repeatedly, but its functional emphasis on behavior prevents it from falling prey to this unfortunate, lobbyist practice.

Mental Disorder and Criminal Responsibility

The value of RB's contribution depends on how much executive function analysis adds to the already voluminous, and contra RB,⁴⁵ not so muddled insanity defense literature. RB claims that the empirical literature on executive function proves the necessity for an independent control excuse, but as discussed previously, it shows no such thing generally or in the case of major

⁴² RB, p. 169.

⁴³ RB, p. 172.

⁴⁴ Francis X. Shen, "Legislating Neuroscience: The Case of Juvenile Justice," 46 *Loy. L. Rev.* 985 (2013).

⁴⁵ RB, p. 177.

mental disorder. RB cites a somewhat older paper that suggests that control problems can be as reliably assessed with a battery of instruments as the assessment of cognitive problems, but the author, Penney, makes no such sweeping claim himself.⁴⁶ He does cite an earlier study by another investigator that makes this claim, but the earlier study is profoundly flawed as support for its or RB's sweeping conclusion. It is a purely behavioral study that uses a tautological definition of loss of control and simply asked forensic evaluators if they could evaluate loss of control accurately.⁴⁷

Indeed, RB's analysis of why some people with mental disorder are less responsible is itself behavioral, although it does note that the behavioral deficits are consistent with the neurological evidence.⁴⁸ For example, RB says that the reason action based on hallucinations may be excused is not because the agent is out of touch with reality, but because the agent is unable to recognize that the hallucinations are not based on a real perceptual stimulus. This is an unconvincing way of explaining why hallucinations compromise reality. The concept of psychosis incorporates the notion that psychotic experience is impervious to contrary evidence and argument. The agent lacks the ability to comprehend reality. To bolster its improbable executive function analysis, RB notes that we all have "odd thoughts," but most people can check the plausibility of those thoughts.⁴⁹ RB thus posits a two-step process: the thoughts are created and then checked. But psychotic experiences do not have this two-step process. Such grossly unrealistic mental states exist in the first place because reality testing is lacking *ex ante*. Psychotic mental states are qualitatively different from "odd thoughts."

RB also argues that mental disorder may not compromise all executive functions, but it may prevent an agent from inhibiting a criminal act the agent knows that he is performing and knows is wrong. It employs the example of a person who hears a command hallucination from the devil to commit arson that the agent knows is a hallucination. The agent could allegedly "... feel such strong emotions in response ... that they cannot inhibit the action driven by their fear."⁵⁰ The example is woefully under-described, however. Was the agent threatened by the devil with some terrible harm if the agent failed to set the fire, and why would the agent be fearful if the agent recognized that the voice was a hallucination? Let's not buck the hypothetical, however, and accept that the agent was overcome by profound emotion at the time of setting the fire. Is the problem one of control or the inconsistency of such an emotional state with the ability to bring good reason to bear on the occasion. Neither the evidence RB cites nor the example entail the need for an independent control excuse.

RB also addresses whether mental disorder *per se* should excuse or whether it should be conjoined with other criteria, such as knowing right from wrong. In other words, is legal

⁴⁶ Steven Penney, "Impulse control and criminal responsibility: Lessons from neuroscience," 35 *Int. J. L. & Psychiatry* 99 (2012).

⁴⁷ Richard Rogers, "APA's position on the insanity defense: Empiricism versus emotionalism," 42 *Am. Psychologist* 840 (1987).

⁴⁸ RB, p. 182.

⁴⁹ RB, p. 183.

⁵⁰ RB, p. 184.

insanity a pure status excuse, as Michael Moore claims,⁵¹ or must the mental disorder also produce other legal-relevant excusing conditions. RB argues that legal insanity is not a status excuse. I agree.⁵² RB says not any mental disorder will suffice. It must be the type that compromises rationality or control by diminishing executive function. RB also denies, however that executive dysfunction should not independently excuse in the absence of mental disorder, but why not if it is caused by variables other than mental disorder that are also not the agent's fault? The usual legal response is that the presence of mental disorder provides some objective evidence that the dysfunction exists and is not the agent's fault, but this is an epistemic and not substantive point. RB does not make this response and offers no substantive justification for rejecting a purely functional excusing condition of executive dysfunction. RB concludes its discussion of Moore's influential account by objecting to his equation of psychosis with legal insanity, which Moore thinks is simply a fortunate coincidence. But RB rightly notes that only psychosis succeeds at being the basis for a successful insanity defense. It is correct that psychotic states are almost unique among mental states in their power to sufficiently compromise executive function to produce cognitive or control excusing conditions. This correct observation about mental disorder still leaves open the question of why non-culpable executive dysfunction shouldn't be an excusing condition *simpliciter*.

RB's discussion of psychopathy reveals only weak dependence on the brain rather than behavior and the good discussion of executive function in psychopaths seems to miss the point. There are references to neuroscience studies, but virtually all the analysis is behavioral. Nothing would have changed in the analysis if all reference to the brain were omitted.

RB argues that virtually all psychopaths should be held responsible because they have a MWS, know the rules, can reason instrumentally, and can use their executive functions to control for affective deficits, such as lack of capacity to feel empathy or guilt. They analogize the psychopath to the color-blind person who can use the MWS to control for that disability. I believe the analogy does not work, however, because color-blindness is not itself a core executive function, but affective incapacities are core executive function because they provide an agent the best normative reasons to behave correctly. The psychopath by definition has no access to these reasons that would give them any motivational force. In Hart's terms, they lack fundamental understanding and cannot conform for that reason. They do not have a MWS. They do not know what empathy and guilt are and how they guide most people, so one wonders how they could be controlled for by using other intact executive functions.

RB surprisingly seems to accept a purely externalist, prudential view of responsibility for psychopaths, holding them accountable if they simply do not take the law as furnishing them with good reasons to obey. But the law furnishes people with good reason to obey, at least in the core of the criminal law, because most people internalize the moral basis for the rules. It is precisely this basis that psychopaths cannot apprehend, however. RB's view seems inconsistent with its earlier argument that criminal responsibility is dependent on moral capacity. Indeed, the

⁵¹ Michael S. Moore, "The Quest for a Responsible Responsibility Test: Norwegian Insanity Law After Breivik," 9 *Criminal Law & Philosophy* 645 (2014).

⁵² Morse, "Moore on the Mind," note 32 *supra*, at 239.

conclusion of the chapter says that “the criminal law does not apply to persons who are incapable of understanding or following it,” but says that observation doesn’t include people who cannot care about it.⁵³ My argument, however, has been that they cannot be expected to follow the rules precisely because they cannot care about the reasons behind them. They lack a morally relevant MWS. The doctrinal means to excuse severe psychopaths would probably be the insanity defense, but no competent defendant would raise it on the basis of psychopathy because they would probably be incarcerated in a secure forensic facility for the rest of their lives unless an intervention to restore their moral MWS was discovered.⁵⁴

Blame, Desert and Punishment

There is much of interest in RB’s discussion of these weighty topics, but space considerations for this essay will limit my analysis to just a few. I agree with RB’s views that desert is coherent, that limiting retributivism is the most adequate theory of punishment, and that the criminal justice system is in need of substantial reforms. As usual, executive function and MWS are invoked as the basis for all these views, but they are hardly necessary preconditions for those views. One could easily make the arguments in Hart’s terms or others. And there is virtually no discussion of the brain. I therefore will address only the discussion’s concluding part in which RB argues that, “our executive theory offers a unique and powerful critique of methods of punishment currently used—namely, long terms of incarceration without substantial rehabilitative programming.”⁵⁵

RB notes that the US has comparatively harsher sentences than most other nations and claims that this violates retributivism’s proportionality principle and that its model supports generally shorter sentences. Many agree with the first claim although there is no principled agreement by how much our sentences exceed what should be their proportional limit. The model does support generally shorter sentences because longer sentences compromise the forward-looking aims of the mixed, limited retributivist theory of punishment, such as reducing offending. US prisons do tend to be “criminogenic.” RB then addresses how the executive function model could improve our punishment practices.

RB provides evidence that those who are imprisoned may have had diminished executive function prior to entering prison, but prison will tend to cause diminution both in already compromised inmates and those who previously had an adequate MWS. They refer to the concept of “prison brain,”⁵⁶ but this is simply a shorthand for behavioral executive functions. The brain does no real work. Lack of physical exercise, lack of opportunity to exercise executive ability in a controlled environment that leaves prisoners with few opportunities to control their lives and make important decisions, and diminishing inmates’ moral agency and ability to

⁵³ RB, p. 198.

⁵⁴ Stephen J. Morse, “Preventive Detention of Psychopaths and Dangerous Offenders,” in Kent Kiehl & Walter Sinnott-Armstrong Eds., *HANDBOOK OF PSYCHOPATHY AND THE LAW* (Oxford University Press, 2013) at 321 (developing the full argument, noting that most US jurisdictions now reject using psychopathy as the basis for an insanity defense and suggesting that other potential means of preventively detaining psychopaths also suffer from deficiencies).

⁵⁵ RB, p. 201.

⁵⁶ RB, p. 217.

develop their character all contribute to the degradation of prisoners' executive function. Solitary confinement, especially for lengthy terms, is particularly criticized in this regard. Moreover, RB correctly notes that lengthy solitary confinement is a psychological hardship as well as a threat to executive function. It recommends use of solitary confinement only in cases of immediate threat of serious harm to the prisoner or others, and even then it should be short. It is not clear what should be done with those who pose such threats on a continuous basis.

To remedy these problems, RB recommends criminal justice responses that are likely to enhance executive function. These include alternative, community-based sanctions for non-violent offenders that permit them to exercise their moral and legal agency. They do not provide evidence that this improves executive function, but a reasonable assumption is that subjects' functions will not diminish. RB is very approving of specialty courts such as mental health or drug courts that divert appropriate defendants from the criminal justice system. These courts are now ubiquitous in the US and have strong proponents, but whether they are a successful alternative is open to question. RB also recommends enriched programs in prisons and jails and cites approvingly one such set of programs in the Chicago jail. If the programs were voluntary and thus consistent with civil liberties, there would be selection effects for which inmates chose to utilize them. Probably those with already good executive functions would opt in and those who need those programs the most would opt out.

It is worth noting to conclude this section, that all the analysis depends on behavior, not on the brain.

Conclusion

The conclusion of this essay should be obvious and therefore it can be brief. RB is a rich book replete with arguments and evidence. But the central-claim that it is providing an original brain-based theory that is demonstrably better than other theories of responsibility is simply not persuasive. Even at the level of behavior, executive functioning analysis is not necessary to reach RB's conclusions and recommendations. A brain-based model is executive function that RB hopes and believes it will be.

Stephen J. Morse is Ferdinand Wakeman Hubbell Professor of Law, Professor Psychology and Law in Psychiatry, and Associate Director, Center for Neuroscience & Society, University of Pennsylvania.