

# Psychopathy, Mental Time Travel, and Legal Responsibility

Andrew Vierra

Received: 16 July 2015 / Accepted: 2 November 2015 / Published online: 9 November 2015  
© Springer Science+Business Media Dordrecht 2015

**Abstract** Neil Levy argues that the degree to which psychopaths ought to be held blameworthy for their actions depends on the extent to which they are capable of mental time travel—episodic memory and episodic foresight. Levy claims that deficits in mental time travel prevent psychopaths from fully appreciating what it is to be a person, and, without this understanding, we can at best hold psychopaths blameworthy for harming non-persons. In this paper, I build upon and clarify various aspects of Levy’s view. Specifically, I begin by outlining the neurobiological data on mental time travel, and I argue that psychopaths, or at least some psychopaths, appear to have the deficits Levy ascribes to them. I then expand upon the legal implications of his argument by using an analogy between juveniles and psychopaths to argue that the penological justification for retributive punishment against psychopaths ought to be substantially diminished.

**Keywords** Moral responsibility · Neil levy · Psychopathy · Personhood · Harm · Blame · Mental time travel · Episodic memory · Episodic foresight · Punishment · Neuroethics · Retribution · Juvenile justice · *Miller v Alabama*

## Introduction

The psychological construct of psychopathy presents an enduring challenge to criminal law. Though it affects less than one percent of the Western world’s population, an estimated twenty-five percent of incarcerated prisoners are psychopaths [1,2]. Compared to other criminals, psychopaths are more likely to offend at a younger age, commit a wider variety of crimes, be violent when they commit crimes, and recidivate [3–7]. Almost all offenders who score highly on the psychopathy test have perpetrated at least one violent crime [8].

In light of these statistics, philosophers, psychologists, legal scholars, and neuroscientists have begun working on a variety of interrelated questions. What is psychopathy? Can it be treated? Should convicted psychopaths be sent to a prison or a hospital? Are psychopaths blameworthy for their actions? In this paper, I defend and expand upon Neil Levy’s answer to the latter question— psychopaths’ degree of moral responsibility for their actions is significantly diminished by their cognitive deficits in mental time travel, i.e., their relative inability to project themselves into the future and to re-experience past events [9]. Levy argues that deficits in mental time travel diminish psychopaths’ ability to understand that others are *persons* with plans and projects for the future that they care about. Levy suspects that this deficit at least partially accounts for psychopaths’ callous indifference towards the well-being of others. In the eyes of a psychopath, harming a person is no more morally significant than harming a non-human animal. Psychopaths cannot intend the type of harm that is

---

A. Vierra (✉)  
Georgia State University, Atlanta, GA, USA  
e-mail: vierranm@gmail.com

distinct to harming persons, that is, the kind of harm that causes the cessation of another's future-oriented plans.

I support Levy's argument, first, by arguing that the available neurobiological data supports Levy's ascription of these deficits to psychopaths. This step is critical because, after all, if psychopaths do not have the deficiencies in question, Levy's argument cannot get off the ground. I then expand on his argument by fleshing out an analogy between psychopaths and juveniles. I argue that the penological justification for *retributively* punishing juveniles and holding them blameworthy for their actions, as laid out in *Miller v Alabama*, rests on minors' deficits in mental time travel. I then claim that because psychopaths share similar deficits with juveniles, the degree to which psychopaths are retributively punished should be reduced to mirror the degree to which juveniles are punished.

### What is Psychopathy?

Psychopathy is a personality disorder characterized by diminished empathy and fear responses, high levels of impulsivity, aggression, superficial charm, pathological lying, narcissism, the tendency to ignore or violate social conventions, and lack of realistic long-term planning. Like many other disorders, not everyone with psychopathy shares the same traits. Some psychopaths score highly in some categories on the Psychopathy Checklist and score no points in others.

Psychopaths are sometimes divided into two types, primary and secondary, to aid in classification [10,11].<sup>1</sup> Secondary psychopaths suffer from large cognitive deficits, including, or so I will argue, deficits in mental time travel. They are further characterized by high levels of impulsivity, anger, poor future planning, violence, and social deviance. Primary psychopaths, on the other hand, are often exceptionally intelligent and capable of carrying out elaborate plans, albeit with emotional detachment [13,14].

<sup>1</sup> Other divisions have been proposed. Mokros et al. [12], for example, divide psychopaths into three categories: manipulative, aggressive, and sociopathic. Even amongst scholars who subscribe to the primary/secondary dichotomy, there is much disagreement on what criteria should be used to decide who belongs in which group. For the purposes of this paper, I use 'secondary psychopaths' as an umbrella for any individual who has received 30 points or more on the PCL-R, is impulsive, and has moderate to severe deficits in mental time travel.

Levy's argument applies to secondary psychopaths. Primary psychopaths do not share the same cognitive deficits and, therefore, are not excused from blame by Levy's argument. This is not to say that primary psychopaths are necessarily morally responsible for their actions. They may be cleared of blame because of other deficits, such as their hypoactive emotional system, but I will take no stand on this debate in this paper. My aim in highlighting the primary/secondary distinction is to emphasize that Levy is making a more fine grained argument on how psychopathy is defined. Many of the extant arguments that attempt to excuse psychopaths of some degree of moral responsibility are only applicable to primary psychopaths. The focus on secondary psychopaths and the differentiation of primary psychopaths from secondary psychopaths are two novel aspects of Levy's argument.

In addition to being novel, Levy's argument is legally significant. In terms of numbers, determining whether secondary psychopaths are blameworthy for harming others is of more practical utility than determining whether primary psychopaths are blameworthy ([9]: 363–364) because secondary psychopaths' impulsivity and poor future planning results in their being prosecuted more often than primary psychopaths [15]. If it turns out that secondary psychopaths are not morally responsible for their actions, then a large number of individuals may avoid being unjustly and disproportionately punished.

### Mental Time Travel

Let me turn now to the faculty that Levy claims is deficient in secondary psychopaths.<sup>2</sup> Mental time travel is defined as the ability to re-experience a past event—episodic memory—pre-experience a future event—episodic foresight—and integrate thinking about one's past and future into a coherent whole. [16].<sup>3</sup> This faculty was initially thought to be composed of two distinct neural networks. Memory experts, like Endel Tulving, believed that the episodic memory system was responsible solely for recalling past events [17] and separate

<sup>2</sup> From this point forward, I will use psychopath and secondary psychopath interchangeably.

<sup>3</sup> Episodic memory uses a different neural network than and should not be confused with semantic memory. Semantic memory refers to the ability to recall facts about the past, e.g., I had a chocolate cake for my birthday.

brain regions were implicated in episodic foresight. This changed in [18] when Tulving noted that one of his amnesic patients with temporal lobe damage experienced deficits not only in recalling what he had done the day before but in stating what he would do the next day.<sup>4</sup> Others have confirmed that amnesic patients have difficulties planning for the future, especially if they are asked to imagine new experiences [20,21]. These findings have suggested that mental time travel may be comprised of one common core network.

In order to identify the regions of the brain that make up the common core network, also called *the default network* (e.g., [22]), researchers performed fMRI scans on individuals asked to actively re-experience past events and imagine future events (e.g., [23–29]). Researchers found comparable levels of activation in the medial temporal and frontal lobes, posterior cingulate and retrosplenial cortex, and lateral parietal and temporal areas.<sup>5</sup>

Levy claims that psychopaths have deficits in mental time travel but does not provide sufficient empirical evidence to justify his claim. He is correct that psychopaths' diminished ability to fully appreciate the future consequences of their actions and make realistic future plans strongly suggests that they have deficits in mental time travel. However, it could also be the case that psychopaths make unrealistic plans because they have a very inflated sense of self. Likewise, their impulsivity, resulting from abnormalities in the ventral medial prefrontal cortex (vmPFC), could just be a manifestation of the diminished activity of higher cognitive networks involved in self-control. I believe that the strongest case for the ascription of deficits in mental time travel to psychopaths will be a neurobiological one, one that suggests that the *majority* of the brain areas that comprise the default network are either structurally or functionally atypical in secondary psychopaths.

<sup>4</sup> This finding was replicated by Klein et al. in a positron emission tomography study [19]. Hassabis et al. [20] also found that amnesic patients with hippocampal damage have difficulties imagining novel experiences.

<sup>5</sup> Many of these fMRI studies confound “future events” and “imagined events”. As Addis et al. [24] point out, imagined events need not be future events. Imagined events can belong to the future, past, or present. Though this methodological constraint is problematic for the stated aim of these studies—determining whether imagining *future* events uses the same brain regions as episodic memory—it is not for our purposes. So long as imagining is necessary for realistically planning future events, psychopaths have the deficits that Levy ascribes to them.

Researchers observed structural asymmetries in psychopaths' anterior hippocampuses [30] and reduced posterior hippocampal and parahippocampal cortical volumes [31,32]—areas that comprise the *medial temporal lobe*.<sup>6</sup> As Levy notes, the vmPFC, part of the *medial frontal lobe*, is also hypothesized to be dysfunctional in secondary psychopaths. Individuals with vmPFC damage as a result of blunt head trauma “acquire sociopathy” and become aggressive,<sup>7</sup> impulsive, and reward driven. [33–40]. Secondary psychopaths struggle with response reversal when they attempt the Iowa gambling task,<sup>8</sup> and psychopathic behavior is also seen following lesions to the vmPFC [41,42]. Finally, Kiehl et al. found decreased activity in the *posterior cingulate gyrus* in fMRI scans of psychopaths encoding, rehearsing, and recognizing twelve words [43].<sup>9</sup>

The default network coupled with a frontal-parietal network involved in executive functioning is thought to be responsible for *autobiographical goal-directed simulations* [44–46]. Spreng et al. [47] observed this functional specificity in a study that suggested that autobiographical simulations activate the default network while a related task, the Tower of London, activates a different neural network altogether. Deficits in mental time travel seem to entail difficulties in realistic step by step future planning and imagining one's future. Psychopaths appear to struggle to integrate their past and future into a coherent narrative (Facet 3 of the Psychopathy Checklist includes lack of realistic long term goals) ([9]: 361). This deficit is exemplified by Jack, an individual who received the highest possible score on the Psychopathy

<sup>6</sup> The medial temporal lobe is directly linked to the retrosplenial cortex so abnormalities in the medial temporal lobe may also affect this cortex.

<sup>7</sup> More specifically, there is an increase in reactive aggression—acts of aggression that serve no instrumental goal (e.g., road rage).

<sup>8</sup> In the Iowa gambling task, test subjects are presented with four decks of cards, some low risk and some high risk. Low risks decks, decks with low rewards but small penalties, have a higher net gain over time than the high risk decks. Neurotypical subjects generally pull exclusively from the low risk decks after 40–50 turns, but subjects with vmPFC damage have trouble switching from the high risk deck.

<sup>9</sup> It is worth noting that citing functional scans to support the claim that a group can't do something runs the risk of making an important modal fallacy. It may be the case that the group in question can do whatever it is that is being tested for but chooses not to. However, I believe that the wealth of non-functional data that I cite dramatically decreases the likelihood that I commit this fallacy. Functional data, though problematic if taken to be sufficient on its own, is useful in conjunction with structural and behavioral evidence.

Checklist. As Robert Hare described him, “Although he was considerably out of shape and overweight from years of prison food and cheap fast food on the outside, he told our interviewer with the confidence of a young athlete in training that he planned to become a professional swimmer when he left prison this time. He would go straight, live off his winnings, and travel on them when he retired at an early age” ([48]: 40).

Importantly, for our purposes, the default network is also active during various forms of mental simulation such as *perspective taking* [16,26]. Mental time travel is characterized by the ability to disengage from one’s environment and imagine the past and future of *oneself and others*.<sup>10</sup> Abnormalities in the default network may result in a relative inability to move outside of the present and understand that others have pasts and futures. Levy argues that the inability to take another person’s perspective may be one reason that psychopaths show such callous indifference towards their victims and fail to appreciate that their victims have plans for the future that they care about ([9]: 363). As one psychopath candidly put it, he could not see any difference between harming a person and squashing a bug ([48]: 33).

### Is Mental Time Travel Necessary for Moral Responsibility?<sup>11</sup>

Levy believes that when we decide whether or not someone is morally responsible, our judgment ought to be “strongly influenced by the moral content of their actions.” That is, “the facts of which the agent is (at least dispositionally) aware and which the agent takes to be relevant to the action” must be taken into account when assigning blame ([9]: 358). What qualifies as a relevant moral fact depends on the circumstances, but a few examples ought to make the general idea clear. Morally and legally, we generally hold others more accountable for intentionally harming others than for accidentally

harming others. Giving peanuts to a friend with a peanut allergy merits far more blame if one knows that one’s friend has the allergy, and having an affair merits less blame if one does not know that one is having an affair (e.g., one has sex with their husband’s twin brother or has sex while sleeping).

Along these lines, Levy argues that one is less blameworthy for harming others if one does not know that one is harming a person. In his words:

Personhood depends on the capacity for conceiving oneself as a persisting being, with plans and projects of one’s own; the distinctive harm involved in killing a person, as opposed to a non-person, arises from interrupting these plans and projects. It is this capacity for personhood that gives someone an interest in continued life. Lacking the capacities required for personhood, most non-human animals have an interest in avoiding suffering but not in continuing to live. It is wrong to harm non-persons, but killing them is very much less wrong than killing persons. It may not be (directly) wrong at all. ([9]: 362)<sup>12</sup>

Deficits in mental time travel prevent psychopaths from fully understanding the moral significance of interrupting other’s plans and projects. Psychopaths are aware that others have projects, but they struggle to take on another person’s perspective and appreciate that others care about these plans. Levy argues that because secondary psychopaths are less able to be even dispositionally aware of this relevant moral fact, their degree of blame ought to be mitigated in proportion to the severity of their deficits in mental time travel. He claims that the content of psychopaths “actions does not include, even as a consideration to be set aside or ignored, the infringement of the autonomy of their victims, i.e., the manner in which being harmed interferes with the victim’s plans and projects.” They thus, cannot intend the kind of harm that can only befall persons, that is, the harm that results in the “permanent cessation of one’s future oriented plans.” Levy argues that, for this reason, “the moral content of psychopaths’ actions is

<sup>10</sup> Along these lines, Adidas and Schacter ([23], [24]) proposed the constructive episodic simulation hypothesis, “which connects work on future simulation with ‘constructive’ aspects of memory, such as memory distortions and errors, by emphasizing memory’s role in simulating future events” [28].

<sup>11</sup> It is worth noting that Levy has defined moral responsibility in many different ways over the course of his career. For the purposes of this paper, I will take Levy to purport his consciousness thesis as developed in his most recent book [49].

<sup>12</sup> Levy does not argue for this definition of personhood, but there are good reasons to accept it. John Locke, for example, argued that a person is “a thinking intelligent being, that has reason and reflection, and can consider itself as itself, the same thinking thing, in different times and places” ([50]: 335). Korsgaard similarly argues that a distinctive part of being a person is the ability to reflect on one’s impulses and decide how one is going to act [51].

likely to be significantly smaller than the moral content of similar acts of non-psychopathic offenders. Our reactive attitudes ought to be similarly attenuated; they deserve a lower degree of condemnation for their actions” ([9]: 363).

Levy’s argument may be objected to on a number of grounds. One might object to his definition of moral responsibility. Angela Smith [52], for example, argues against the importance of being aware of relevant moral facts. She claims that we routinely hold others responsible for the facts that they are not aware of, such as when a close friend forgets one’s birthday or a student forgets to come and take an exam. In a similar vein, Nomy Arpaly [53] considers the case of Huckleberry Finn, who chooses to help a slave escape even though he takes himself to be doing something that is morally wrong. Although Huck is not conscious of his reasons for abetting the slave’s escape, Arpaly claims that his actions are a response to the slave’s humanity and merit praise. Since he is praiseworthy even though he is not conscious of the moral facts that make him praiseworthy, Levy’s definition of moral responsibility must be false. One might also object to Levy’s definition of personhood or even the relevance of personhood for moral responsibility. Perhaps knowing the rules or conventions, e.g., it is against the law to kill another human, is sufficient for full moral responsibility. Whether or not one knows all of the relevant moral facts is only of secondary significance.

In the next section, I make a novel argument in defense of Levy’s position that circumvents objections like these. Rather than focusing on how deficits in mental time travel diminish moral responsibility, which will necessarily rest on a number of controversial premises, I focus on how these deficits might diminish legal responsibility, specifically, the penological justification for retributive punishment. I argue that if we hold psychopaths fully blameworthy for harming others, then we are legally obligated to hold juveniles fully blameworthy for harming others. Juveniles and psychopaths share many of the same neurological deficits as a consequence of incomplete or stunted neurodevelopment. Thus, many of the arguments the Supreme Court have made against retributively punishing juveniles apply to psychopaths as well. I argue that there is, therefore, no in principle reason for blaming psychopaths and not juveniles. If one largely mitigates juveniles’ blame, then one must proportionately excuse psychopaths for similar violent offenses.

My argument will support Levy’s goal of “fewer people being unjustly held morally responsible” ([49]: x) without presupposing many hotly contested philosophical positions. The advantages of my argument will thus be largely pragmatic, but I will also show how it puts pressure on positions that run counter to Levy’s.

## Legal Considerations

The Supreme Court recently considered the case of 14-year-old Evan Miller, a juvenile sentenced to life in prison [54]. In 2003, a drug dealer came to Evan’s house to sell drugs to his mother. Evan and his friend followed the drug dealer out to his trailer where the three of them smoked and played drinking games. When the drug dealer passed out, Evan and his friend took the dealer’s wallet causing the dealer to wake up and grab Evan’s friend by the throat. Evan proceeded to beat the man repeatedly with a baseball bat, allegedly stating “I am God, I’ve come to take your life” (*Miller v State*). Evan was originally sentenced to life in prison without parole, but this was overturned by the Supreme Court in *Miller v Alabama*. The Court argued that sentencing a juvenile to life in prison violates the Eighth Amendment’s ban on cruel and unusual punishments and cited *Graham v Florida* where they argued that “the concept of proportionality is central to the Eighth Amendment”, and juveniles’ sentences ought to be proportionate to their diminished culpability.

Juveniles are considered to be fundamentally different than adults for sentencing purposes. They lack a fully developed sense of responsibility, and, as a result, they are impulsive, reckless, heedless risk takers (*Miller v Alabama*). These personality traits manifest in behavioral tests. Cauffman et al. [55] found that adolescents are more likely to pull from risky decks in the Iowa gambling test than adults. Juveniles also struggle with impulse control tests, suggesting an inability to appreciate future benefits.

*Graham* noted that “developments in psychology and brain science continue to show fundamental differences between juvenile and adult minds”—for example, in “parts of the brain involved in behavior control.” These differences center around the default network and are thought to underlie juveniles’ propensity towards reckless behavior and impulsivity. Many areas of juveniles’ brains do not fully myelinate until they reach adulthood. These areas include the posterior cingulate cortex, and the



subiculum and presubiculum—parts of the medial temporal memory system [56]. The hippocampal-cortical connections that underlie autobiographical and episodic forms of memory also continue to develop until early adulthood, [57,58] and hippocampal lateralization, a strong predictor of performance on relational memory tests and the capacity to engage in mental time travel, increases with age [59].

These “findings—of transient rashness, proclivity for risk, and inability to assess consequences—lessen a child’s ‘moral culpability’” (*Miller v Alabama*) and diminish the “penological justification” for harsh sentences against juveniles (*Roper v Simmons*) [60]. All of these characteristics are thought to be related to the immaturity of the default network. Juveniles may struggle to assess future consequences because they are largely unable to project themselves into the future, a capacity that depends on mental time travel and the ability to realistically imagine future events. The Supreme Court, in citing the neurological differences underlying these behaviors, excuses juveniles from excessive punishments in part because of their deficits in mental time travel.

The upshot of this discussion is that the brain differences *Graham* cites and behavioral traits such as impulsivity are shared by both juveniles and secondary psychopaths [61]. The Supreme Court diminished the penological justification for retributive punishments against juveniles on the basis of the claim that their brains are not fully developed, and they have difficulty controlling their behavior. There is thus no in principle reason why the degree of blameworthiness of others with similar degrees of neural development and similar personality traits should not be reduced as well. Indeed, we already mitigate blame from individuals with Turner’s and Down’s syndrome and Alzheimer’s disease—diseases characterized by the dysfunction of the default network. Secondary psychopaths not only share these deficits in the default network, but they also struggle with impulse control. Consistency in sentencing requires that either new reasons be cited against retributively punishing juveniles or that psychopaths be likewise protected by the Eighth Amendment against disproportionate retributive punishments. As it stands, the degrees of culpability of secondary psychopaths does not match the severity of their punishments.

Of course, one might object that juveniles’ sentences are also reduced because they are easily rehabilitated, and because psychopathy is not currently treatable, psychopaths’ sentences should not be reduced. But note that

this objection fails to distinguish between three kinds of punishment—retributive, preventative, and rehabilitative. Neuroplasticity and other factors that make juveniles treatable are not reasons against retributive punishment. They are reasons to rehabilitate juveniles instead of imprisoning them for preventative purposes. Having a malleable brain does not make one less blameworthy, it just makes one more treatable. Though this objection does point out that there are non-retributive reasons to imprison secondary psychopaths, e.g., public safety, it does not show that retributive punishments are justified against psychopaths. I agree that psychopaths, in some circumstances, ought to be detained for preventative purposes. However, if a treatment were to become available for psychopathy, then just as children are rehabilitated and released, psychopaths ought to be offered rehabilitation and excused from excessive sentencing.

One might also bite the bullet and argue that the Supreme Court is mistaken in mitigating blame from juveniles. Juveniles and psychopaths are fully blameworthy for harming others, and they both ought to be retributively punished for their offenses. Though my argument has no recourse against this line of argumentation, I do believe that my argument shifts the burden of proof over to the objector’s side. Traditionally, those who have aimed to exonerate psychopaths from blame have been forced to fight against legal precedents and common intuitions. However, if the analogy between juveniles and psychopaths is sound, then philosophers like Levy may actually be holding the less counterintuitive position. Juveniles’ reduced culpability is widely accepted, at least in most Western countries. As the saying goes, “kids will be kids”.

## Conclusion

This paper aimed to expand on Levy’s argument in two ways. First, it outlined the neurobiological research on mental time travel and argued both that psychopaths have deficits in mental time travel and that these deficiencies are also present in children/adolescents. It then argued that because dysfunction in the default network appears to be sufficient to clear minors of some degree of blame, it also ought to diminish the degree to which psychopaths are blameworthy for harming others. One novel consequence of this argument is that it extended Levy’s argument into the legal realm. Not only did it suggest that psychopaths, or at least some psychopaths,

are not fully morally responsible, but it argued that just as retributive justice is not fully justified against children, it is not fully justified against psychopaths.

**Acknowledgments** This paper has benefited greatly from comments from a number of colleagues at Georgia State University. I am especially grateful to Nicole Vincent and Eddy Nahmias for their invaluable feedback. I also thank Jared Riggs, Calvin Warner, Simon Stern, and the three anonymous reviewers for their critical comments and the generous donation of their time. Any mistakes are my own.

## References

- Coid, J., M. Yang, S. Ullrich, A. Roberts, and R. Hare. 2009. Prevalence and correlates of psychopathic traits in the household population of Great Britain. *International Journal of Law and Psychiatry* 32(2): 65–73.
- Hare, R.D. 1991. *Manual for the Hare Psychopathy Checklist Revised*. Toronto: Multi-Health Systems.
- Hemphill, J.F., R.D. Hare, and S. Wong. 1998. Psychopathy and recidivism: A review. *Legal and Criminological Psychology* 3(1): 139–170.
- McCuish, E.C., R. Corrado, P. Lussier, and S.D. Hart. 2014. Psychopathic traits and offending trajectories from early adolescence to adulthood. *Journal of Criminal Justice* 42(1): 66–76.
- Porter, S., A.R. Birt, and D.P. Boer. 2001. Investigation of the criminal and conditional release profiles of Canadian federal offenders as a function of psychopathy and age. *Law and Human Behavior* 25(6): 647–661.
- Porter, S., M. Woodworth, J. Earle, J. Drugge, and D. Boer. 2003. Characteristics of sexual homicides committed by psychopathic and nonpsychopathic offenders. *Law and Human Behavior* 27(5): 459–470.
- Vaughn, M.G., M.O. Howard, and M. DeLisi. 2008. Psychopathic personality traits and delinquent careers: An empirical examination. *International Journal of Law and Psychiatry* 31(5): 407–416.
- Hare, R.D., and L.M. McPherson. 1984. Violent and aggressive behavior by criminal psychopaths. *International Journal of Law and Psychiatry* 7: 35–50.
- Levy, Neil. 2013. Psychopaths and blame: The argument from content. *Philosophical Psychology* 27(3): 351–67.
- Coid, J., M. Freestone, and S. Ullrich. 2012. Subtypes of psychopathy in the British household population: Findings from the national household survey of psychiatric morbidity. *Social Psychiatry and Psychiatric Epidemiology* 47(6): 879–891.
- Karpman, B. 1929. The problem of psychopathies. *Psychiatric Quarterly* 3: 495–525.
- Mokros, A., R. Hare, C. Neumann, P. Santtila, E. Habermeyer, and J. Nitschke. 2015. Variants of psychopathy in adult male offenders: A latent profile analysis. *Journal of Abnormal Psychology* 124(2): 372–86.
- Hicks, B., K. Markon, C. Patrick, R. Krueger, and J. Newman. 2004. Identifying psychopathy subtypes on the basis of personality structure. *Psychological Assessment* 16(3): 276–288.
- Skeem, J., P. Johansson, H. Andershed, M. Kerr, and J. Louden. 2007. Two subtypes of psychopathic violent offenders that parallel primary and secondary variants. *Journal of Abnormal Psychology* 116(2): 395–409.
- Walters, G.D. 2003. Predicting institutional adjustment and recidivism with the psychopathy checklist factor scores: A meta-analysis. *Law and Human Behavior* 27: 541–558.
- Payne, G., R. Taylor, H. Hayne, and D. Scarf. 2015. Mental time travel for self and other in three- and four-year-old children. *Memory* 23(5): 675–682.
- Tulving, E. 1983. *Elements of Episodic Memory*. New York: Oxford University Press.
- Tulving, E. 2002. Chronesthesia: Conscious awareness of subjective time. In *Principles of frontal lobe function*, ed. D.T. Stuss and R.T. Knight, 311–325. New York: Oxford University Press.
- Klein, S.B., J. Loftus, and J.F. Kihlstrom. 2002. Memory and temporal experience: The effects of episodic memory loss on an amnesic patient's ability to remember the past and imagine the future. *Social Cognition* 20: 353–379.
- Hassabis, D., D. Kumaran, S.D. Vann, and E.A. Maguire. 2007. Patients with hippocampal amnesia cannot imagine new experiences. *Proceedings of the National Academy of Sciences of the United States of America* 104: 1726–1731.
- Kwan, D., N. Carson, D.R. Addis, and R.S. Rosenbaum. 2010. Deficits in past remembering extend to future imagining in a case of developmental amnesia. *Neuropsychologia* 48: 3179–3186.
- Raichle, M.E., A.M. MacLeod, A.Z. Snyder, W.J. Powers, D.A. Gusnard, and G.L. Shulman. 2001. A default mode of brain function. *Proceedings of the National Academy of Sciences of the United States of America* 98: 676–682.
- Addis, D.R., A.T. Wong, and D.L. Schacter. 2007. Remembering the past and imagining the future: Common and distinct neural substrates during event construction and elaboration. *Neuropsychologia* 45: 1363–1377.
- Addis, D.R., L. Pan, M.A. Vu, N. Laiser, and D.L. Schacter. 2009. Constructive episodic simulation of the future and the past: distinct subsystems of a core brain network mediate imagining and remembering. *Neuropsychologia* 47: 2222–2238.
- Addis, D.R., T. Cheng, R.P. Roberts, and D.L. Schacter. 2011. Hippocampal contributions to the episodic simulation of specific and general future events. *Hippocampus* 21: 1045–1052.
- Buckner, R.L., and D.C. Carroll. 2007. Self-projection and the brain. *Trends in Cognitive Sciences* 11: 49–57.
- Okuda, J., T. Fujii, H. Ohtake, T. Tsukiura, K. Tanji, K. Suzuki, R. Kawashima, H. Fukuda, M. Itoh, and A. Yamadori. 2003. Thinking of the future and past: the roles of the frontal pole and the medial temporal lobes. *NeuroImage* 19: 1369–1380.
- Schacter, D.L., D.R. Addis, D. Hassabis, V.C. Martin, R.N. Spreng, and K. Szpunar. 2012. The future of memory: Remembering, imagining, and the brain. *Neuron* 76: 677–694.
- Szpunar, K. 2010. Episodic future thought an emerging concept. *Perspectives on Psychological Science* 5: 142–162.
- Raine, A., S. Ishikawa, E. Arce, T. Lencz, K. Knuth, S. Bihrl, L. LaCasse, and P. Colletti. 2004. Hippocampal structural

- asymmetry in unsuccessful psychopaths. *Biological Psychiatry* 55(2): 185–191.
31. Ermer, E., L. Cope, P. Nyalakanti, V. Calhoun, and K. Kiehl. 2013. Aberrant paralimbic gray matter in incarcerated male adolescents with psychopathic traits RH: Paralimbic gray matter and psychopathy. *Journal of the American Academy of Child and Adolescent Psychiatry* 52(1): 94–103.
  32. Laakso, M., O. Vaurio, E. Koivisto, L. Savolainen, M. Eronen, H. Aronen, P. Hakola, E. Repo, H. Soininen, and J. Tiihonen. 2001. Psychopathy and the Posterior Hippocampus. *Behavioural Brain Research* 118(2): 187–93.
  33. Anderson, S.W., A. Bechara, H. Damasio, D. Tranel, and A.R. Damasio. 1999. Impairment of social and moral behaviour related to early damage in human prefrontal cortex. *Nature Neuroscience* 2: 1032–1037.
  34. Blair, R.J.R., and L. Cipolotti. 2000. Impaired response reversal: A case of “acquired sociopathy”. *Brain* 123: 1122–1141.
  35. Buchanan, T.W., D. Driscoll, S.M. Mowrer, J.J. Sollers, J.F. Thayer, C. Kirschbaum, and D. Tranel. 2010. Medial prefrontal cortex damage affects physiological and psychological stress responses differently in men and women. *Psychoneuroendocrinology* 35(1): 56–66.
  36. Burgess, P.W., and R.L. Wood. 1990. Neuropsychology of behaviour disorders following brain injury. In *Neurobehavioural sequelae of traumatic brain injury*, ed. R.L. Wood, 110–113. London: Taylor and Francis.
  37. Damasio, A.R., D. Tranel, and H. Damasio. 1990. Individuals with sociopathic behavior caused by frontal damage fail to respond autonomically to social stimuli. *Behavioural Brain Research* 41(2): 81–94.
  38. Eslinger, P.J. 1998. Neurological and neuropsychological bases of empathy. *European Neurology* 39(4): 193–199.
  39. Grattan, L.M., R.H. Bloomer, F.X. Archambault, and P.J. Eslinger. 1994. Cognitive flexibility and empathy after frontal lobe lesion. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology* 7(4): 251–259.
  40. Pennington, B.F., and L. Bennetto. 1993. Main effects or transaction in the neuropsychology of conduct disorder? Commentary on “the neuropsychology of conduct disorder”. *Development and Psychopathology* 5: 153–164.
  41. Bechara, A., D. Damasio, A. Damasio, and G. Lee. 1999. Different contributions of the human amygdala and ventromedial prefrontal cortex to decision-making. *Journal of Neuroscience* 19: 5473–5481.
  42. Izquierdo, A., R.K. Suda, and E.A. Murray. 2004. Bilateral orbital prefrontal cortex lesions in rhesus monkeys disrupt choices guided by both reward value and reward contingency. *Journal of Neuroscience* 24: 7540–7548.
  43. Kiehl, K.A., A.M. Smith, R.D. Hare, A. Mendrek, B.B. Forster, and P.F. Liddle. 2001. Limbic abnormalities in affective processing by criminal psychopaths as revealed by functional magnetic resonance imaging. *Biological Psychiatry* 50: 677–684.
  44. Andrews-Hanna, J.R., J.S. Reidler, J. Sepulcre, R. Poulin, and R.L. Buckner. 2010. Functional-anatomic fractionation of the brain’s default network. *Neuron* 65: 550–562.
  45. D’Argembeau, A., D. Stawarczyk, S. Majerus, F. Collette, M. Van der Linden, D. Feyers, P. Maquet, and E. Salmon. 2010. The neural basis of personal goal processing when envisioning future events. *Journal of Cognitive Neuroscience* 22: 1701–1713.
  46. Vincent, J.L., I. Kahn, A.Z. Snyder, M.E. Raichle, and R.L. Buckner. 2008. Evidence for a frontoparietal control system revealed by intrinsic functional connectivity. *Journal of Neurophysiology* 100: 3328–3342.
  47. Spreng, R.N., W.D. Stevens, J.P. Chamberlain, A.W. Gilmore, and D.L. Schacter. 2010. Default network activity, coupled with the frontoparietal control network, supports goal-directed cognition. *NeuroImage* 53: 303–317.
  48. Hare, R.D. 1993. *Without conscience: The disturbing world of the psychopaths among us*. New York: Simon Schuster.
  49. Levy, Neil. 2014. *Consciousness and moral responsibility*. Oxford: Oxford University Press.
  50. Locke, J. 1975. In *An Essay Concerning Human Understanding*, ed. P. Nidditch. Oxford: Clarendon.
  51. Korsgaard, C. 1996. *The Sources of Normativity*. Cambridge: Cambridge University Press.
  52. Smith, A. 2005. Responsibility for attitudes: Activity and passivity in mental life. *Ethics* 115(2): 236–71.
  53. Arpaly, N. 2002. *Unprincipled virtue: An inquiry into moral agency*. Oxford: Oxford University Press.
  54. Miller v. Alabama, 132 S. Ct. 2455, 567 U.S., 183 L. Ed. 2d 407 (2012)
  55. Cauffman, E., E. Shulman, L. Steinberg, E. Claus, M. Banich, S. Graham, and J. Woolard. 2010. Age differences in affective decision making as indexed by performance on the Iowa gambling task. *Developmental Psychology* 46(1): 193–207.
  56. Benes, F. 1989. Myelination of cortical-hippocampal relays during late adolescence. *Schizophrenia Bulletin* 15(4): 585–93.
  57. Giedd, J.N., J.W. Snell, N. Lange, J.C. Rajapakse, B.J. Casey, P.L. Kozuch, and J.L. Rapoport. 1996. Quantitative magnetic resonance imaging of human brain development: Ages 4–18. *Cerebral Cortex* 6: 551–560.
  58. Sowell, E.R., D. Delis, J. Stiles, and T.L. Jernigan. 2001. Improved memory functioning and frontal lobe maturation between childhood and adolescence: A structural MRI study. *Journal of the International Neurological Society* 7: 312–322.
  59. Hopf, L., M. Quraan, M. Cheung, M. Taylor, J. Ryan, and S. Moses. 2013. Hippocampal lateralization and memory in children and adults. *Journal of the International Neuropsychological Society* 19(10): 1042–52.
  60. Roper v. Simmons, 125 S. Ct. 1183, 543 U.S., 161 L. Ed. 2d 1 (2005).
  61. Graham v. Florida. 130 S. Ct. 2011, 560 U.S., (2010)