# Moral Cognition: Introduction

7

Stephan Schleim

## Contents



**Abstract**

Research on moral cognition is a growing and heavily multidisciplinary field. This section contains chapters addressing foundational psychological, neuroscientific, and philosophical issues of research on moral decision-making. Furthermore, beyond summarizing the state of the art of their respective fields, the authors formulate their own proposals to answer open questions such as those on the relation between emotion and cognition in moral psychology, the idea that there is a "moral module" in the human brain, the relevance of this research for ethics and meta-ethics, the various psychological and philosophical meanings of "intuition" and how intuitions can have a justificatory role, or the connection between the psychological, neuroscientific, and philosophical levels in popular experiments on moral cognition. Research on moral decision-making is challenging, for empiricists as well as theoreticians, and is related to several applied questions of neuroethics which are briefly addressed at the end of this introduction.

S. Schleim
Faculty of Behavioral and Social Sciences, Theory and History of Psychology, Heymans Institute for Psychological Research, University of Groningen, Groningen, The Netherlands

Neurophilosophy, Munich Center for Neurosciences, Ludwig-Maximilians-University Munich, Munich, Germany
e-mail: s.schleim@rug.nl

J. Clausen, N. Levy (eds.), *Handbook of Neuroethics*,
DOI 10.1007/978-94-007-4707-4_94,

## Introduction: Moral Cognition

The early twenty-first century has seen an increasing academic interest in moral cognition that has been truly multidisciplinary, connecting branches of philosophy with empirical disciplines, reconsidering traditional questions of ethics or meta-ethics – for those unfamiliar with the term: "the attempt to understand the metaphysical, epistemological, semantic, and psychological, presuppositions and commitments of moral thought, talk, and practice" (Sayre-McCord 2012) – as well as age-old debates in the light of new scientific evidence (see Fig. 7.1). To name just two broad and important examples which are stimulated by new psychology and neuroscience findings and which are also intensively discussed in the contributions to this section: First, the question of the nature and role of moral reasoning, emotion, or intuition and, second, the question of whether there are natural moral facts and properties, perhaps even "hard-wired" into our brain, as once suggested by Michael Gazzaniga (2005).

Philosophers have debated whether moral judgments *should* be based in the passions or in reason, with the Scottish philosopher David Hume being a famous proponent of the passions (Hume 1777/1975) and the German philosopher Immanuel Kant an eminent advocate of reason (Kant 1785/2011; for a compilation of historical readings, see Nadelhoffer et al. 2010). Sometimes inspired by that traditional historical debate but with a different question in mind, psychologists tried to understand *how* moral judgments *are actually made* by lay people or certain kinds of experts, sometimes with an emphasis on the development of their moral faculties as they mature from childhood to adulthood or as a function of their education (Gilligan 1982; Kohlberg 1984; Lind et al. 2010; Piaget 1932), sometimes focusing on situational characteristics of a particular environment influencing moral judgments (Haidt 2001; Pizarro 2000).

With the expansion of cognitive neuroscience and the neuroscience turn in psychology taking place (Littlefield and Johnson 2012; Pickersgill and van Keulen 2012), it was probably just a question of time before moral judgments were investigated in a functional magnetic resonance imaging brain scanner (Greene et al. 2001; Moll et al. 2001). It is noteworthy that many new explanations offered for the processes underlying moral decision-making employed the traditional explanatory pattern contrasting emotion and reason, with an emphasis on the former (Haidt 2007). However, it is important to emphasize the descriptive-normative divide, or the is-ought-problem, respectively, once again: Whereas the philosophers mentioned above debated which psychological faculty we should prioritize in order to make the morally right decision, most empirical researchers interpreted their evidence with respect to the faculties actually underlying the moral decisions their subjects made in a developmental context or an experiment. That is, they tried to explain how moral cognition and behavior works, not what is the morally right thing to do.

However, had the research been restricted to that descriptive question only, just offering an updated scientific account of how people of different kinds make moral decisions under certain circumstances, moral neuroscience might have just become a modernized form of moral psychology, promising to offer better explanations

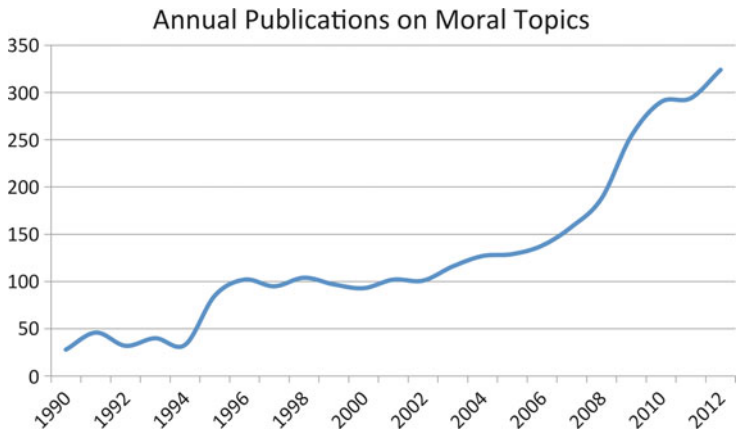


**Fig. 7.1** The number of publications in the ISI Web of Science on moral topics was smaller than 50 until 1994, fluctuated around 100 until 2002, and increased steeply since then up to 324. The increase covers all three sub-databases for Social Sciences, Science and Technology, and Arts and Humanities publications. This pattern is not just due to the overall increase of annual publications in the Web of Science with 4.6 million in 2000 up to 7.3 million in 2012 (1.6-fold increase), because the number of publications on moral topics rose from 93 to 324 in the same period (3.5-fold). Method: Topic Search with at least one phrase match of "moral" in combination with any of the following items: judgment, emotion, reasoning, decision, cognition, behavior, and behavior. That is, every publication counted here contains at least one instance of, for example, the phrase "moral cognition" as its topic in the database

owing to its more direct access to the central organ of the mind, the human brain. The seductive allure, from the neuroscientific point of view, and the provocation, from the philosophical point of view, instead consisted in the attempt to cross the border between the descriptive and the normative, for example, by distinguishing morally justified ("rational") intuitions from unjustified ("irrational") ones, based on the brain areas, associated psychological processes, and evolutionary pathways putatively underlying them (Greene et al. 2004, 2008; Singer 2005). Some believed that in the perceived stalemate between different kinds of moral theories, where philosophers sometimes used imagined or actual moral dilemmas to undermine a theory by showing that the assumptions underlying it or decisions following from it are counterintuitive, neuroscience might lend a helping hand.

It probably were such attempts that invited others to critically investigate the explicit or implicit normative presumptions of such arguments (e.g., Kahane 2011), sometimes concluding that the attempts were normatively completely insignificant (e.g., Berker 2009) or, by contrast, identifying genuinely new ways in which moral psychology and neuroscience could and perhaps even should enrich moral philosophy (e.g., Joyce 2008; ▶ Chap. 10, "Psychology and the Aims of Normative Ethics," this section). It goes without saying that some philosophers took the occasion to fundamentally inquire into the meaning of essential concepts of the research such as "moral intuition" (e.g., ▶ Chap. 11, "Moral Intuition in Philosophy

and Psychology," this section). Concurrently, psychologists and neuroscientists questioned the empirical validity of some of the proposed explanations of moral cognition, sometimes re-analyzing or re-interpreting available data (e.g., McGuire et al. 2009; Moll and de Oliveira-Souza 2007), sometimes carrying out improved follow-up experiments (e.g., Moore et al. 2008). Investigating moral cognition has indeed become a diverse and fruitful endeavor attracting empirical as well as theoretical contributions from many disciplines (Waldmann et al. 2012). The following chapters of this section aim to add their share:

## The Chapters in this Section

Chelsea Helion and David A. Pizarro, both at Cornell University in Ithaca, NY, USA, start out with a great service to the readers who are not very familiar with the state of the art in moral psychology: In their paper *Beyond dual-processes: The interplay of reason and emotion in moral judgment*, they review many essential developments in that discipline since the late 1990s, that is, the period when psychologists increasingly started to doubt that reason alone accounts for moral judgments. Moreover, experts in the field are likely to profit from engaging with Helion's and Pizarro's argument, stating that psychology's popular dual-process models (Kahneman 2011) and psychologically inspired philosophy do not adequately explain moral cognition. Dual-process models are models that usually distinguish quick, spontaneous reactions, often related to intuition and emotion, from slower, deliberative ones, often associated with reason and cognition.

Discussing the case of disgust in more detail, the authors emphasize that emotion and reason as well as their supposed interaction should not be understood too simplistically: After all, emotional processes are not simply something given that directly influence moral judgment. Rather they are themselves processes that can be regulated and adapted to different situations. Helion and Pizarro criticize that emotion regulation, a process studied intensively in other branches of psychology, has hitherto not been considered sufficiently in research on moral judgment. Depending on the moral context, they argue, people can upregulate or downregulate emotions based on their specific moral beliefs and goals, such as when a vegetarian intensifies his or her feelings of disgust in response to cruelty toward animals. This could explain why people experiencing the same emotions initially might arrive at different moral decisions.

While Helion's and Pizarro's proposal implies that we should beware of simplified psychological and philosophical understandings of emotion and reason and thus makes explanations more complex, it also promises a deeper understanding of moral cognition by drawing our attention not only to the particular circumstances and contexts in which people make moral decisions, but also to their further moral attitudes and beliefs that influence the way in which emotions affect judgments. In contrast to simple models that reduce moral decision-making only to emotion or only to reason and in contrast to dual-process models that take both kinds of processes into account but still presume a clear distinction between them,

Helion and Pizarro conclude that the cognitive cannot be separated strictly from the affective. Although parsimony or simplicity is often considered as virtue of scientific explanations, they cannot be virtuous if they are too reductive to do justice to the phenomena under investigation; it will be interesting to see whether an emphasis on emotion regulation and the complex association between emotion and reason has more explanatory power than other popular accounts within moral psychology and neuroscience.

In a similar way, DaniloBzdok and Simon Eickhoff at the Research Center Jülich together with DominikGroß at the University of Aachen, Germany, provide a service to readers unfamiliar with the scientific literature, but now with a focus on moral neuroscience. After first summarizing several key findings of years of neuroimaging research on moral decision-making, they raise the general question whether the many singular findings of brain areas activated during moral cognition found in previous studies can be integrated into a large-scale network. To answer it, they use a method called Coordinate-Based Meta-Analysis in combination with an activation likelihood estimation algorithm to test for consistent patterns of brain activation across those studies.

Bzdok, Eickhoff, and Groß discuss the results of their meta-analysis particularly with respect to three broad cognitive categories popular in social and cognitive neurosciences, namely, theory of mind, that is, thinking about somebody else's mental states, empathy, and mind-wandering, that is, lying in a brain scanner without any external stimulation. As they show in their paper *The Neurobiology of Moral Cognition: Relation to Theory of Mind, Empathy, and Mind-Wandering*, activation in areas frequently associated with these cognitive categories is often also seen in studies of moral cognition, though to varying degrees. This shows, according to the authors, that there is no dedicated morality module in the human brain, or in their own words, that "no part of the brain is uniquely devoted to moral cognition but this capacity is very likely deployed across several heterogeneous functional domains."

While this finding, simplified to the conclusion that morality, when looking at the brain, is essentially social, may not be surprising to some readers, the authors discuss important experimental and theoretical implications of their results: The suggestion that moral cognition may not be a unified psychological entity raises the question whether there could actually be different kinds of moral cognition that might nevertheless be identified and/or separated in further studies. The diversity on the neuroscientific level could reflect the diversity of the concept of morality itself. Further, their outcome might reveal a general bias in experimental designs used to investigate moral decision-making, often relying on abstract, possibly not very ecologically valid stimuli restricted to moral cognition, not moral *behavior*. Bzdok, Groß, and Eickhoff conclude with a discussion of the meaning of their findings for neuroethics, particularly the descriptive-normative-divide or the is-ought-problem, respectively. They emphasize what we should be careful not to neglect it.

Their general finding is actually reminiscent of Helion's and Pizarro's argument not to underestimate the complexity of moral cognition: Just as it is unlikely that this can be accounted for by only a few basic psychological processes, it is unlikely

that it can be reduced to the brain activity of only a few basic areas. It is an interesting question for further analysis what the brain activity overlap between emotion regulation and moral cognition would look like, a research question involving the expertise of both groups of authors. Surprisingly though, the psychological as well as the neuroscientific review both invite us to reconsider basic questions of what moral cognition actually is and what is the best way to investigate it empirically, basic questions as they are particularly essential to philosophical inquiry, to which we now turn with respect to the next two chapters:

Regina Rini at the University of Oxford, UK, starts out with a service to those who are not very familiar with the scope and aims of moral philosophy: In her paper *Psychology and the Aims of Normative Ethics*, she poses the very general question what normative ethics actually is about, how it is defined. However, just as noted before that there is not only one understanding of "morality," she points out that it is unlikely that there is only one definition of "normative ethics" either. Rini nevertheless identifies three essential questions of that field: First, what a moral agent is; second, which actions are morally permitted or even required; and third, which moral beliefs are justified.

She tries to answer these questions in a dialectical fashion in order to show how moral philosophy can benefit from moral psychology and neuroscience. That is, she starts out with a negative answer why empirical research on moral cognition and decision-making is not relevant to each of the three questions and counters them with a positive rebuttal subsequently, discussing classical sources as well as recent contributions of normative ethics. Rini supports each of her positive answers with instructive examples. Generally, to show that moral psychology or neuroscience has at least some relevance to moral philosophy, it would suffice that she provides a convincing argument in only one of the three cases.

While Rini presents these arguments in favor of the normative significance of the empirical investigation of moral cognition, she concedes that the disciplinary interactions are still at a very early stage and concludes with a number of difficult but important questions for future research: Should it not matter if moral theories demanded something of us that we are psychologically incapable of? Or should this rather motivate us to change our psychological constitution? Would a better scientific understanding of the origins of our moral beliefs undermine their justification and ultimately lead to moral skepticism, the view that *none* of our moral beliefs are justified? In contrast to the humility of her eventual conclusion on psychology and the aims of normative ethics, Rini is quite convinced that psychologists – understood in a broad sense – and philosophers have a lot of work to do together.

Antti Kauppinen at Trinity College, Dublin, UK, contributes his share to that joint work for psychologists and philosophers, in relation to the problem of moral skepticism that Rini briefly refers to in her concluding paragraph. In his paper *Moral Intuition in Philosophy and Psychology*, he investigates whether and under which circumstances moral intuitions may have a justificatory role – but not without first clarifying many of the different possible definitions of "intuition" in philosophy and psychology, particularly when understood as a psychological state.

In a systematic manner, Kauppinen first analyzes different notions of "intuition" in contemporary empirical moral psychology and neuroscience, discussing the dual-process model, the relation between intuition and explanation in the sense that intuitions are understood as proximal causes of moral judgments, that is, that they explain to some extent why we make particular moral decisions, and research suggesting their putative unreliability. He continues, second, with a discussion of the role of intuitions in moral philosophy, namely, two kinds of Intuitionism and Rawlsian Coherentism, and eventually analyzes how intuitions could or could not have a role in justifying these accounts.

Although Kauppinen takes empirical research on moral cognition into account throughout his paper, he particularly devotes his third and last part to a reconciliation of the rather psychological and rather philosophical parts. After emphasizing once again that (moral) intuitions could be quite different things within the different frameworks, he critiques the dual-process model in a way that is reminiscent of Helion's and Pizarro's critique of its simplistic account of emotions, namely, by emphasizing that we should not take intuitions as something that is independent of someone's further beliefs. Indeed, Kauppinen subsequently clarifies the relation between the concepts of "emotion" and "intuition" in the end and summarizes his view regarding the circumstances under which intuitions can play "at least a quasi-foundational role in moral justification."

In the fifth and last paper of this section, titled *The half-life of the moral dilemma task – a case study in experimental (neuro-) philosophy*, Stephan Schleim at the University of Groningen, The Netherlands, carries out a deep analysis of the philosophical as well as the psychological questions that inspired the possibly most popular experiments in moral neuroscience, the moral dilemma task as investigated by Joshua Greene and collaborators (Greene et al. 2001, 2004). With what he calls "The Experimental Neurophilosophy Cycle" he particularly wants to inform those readers not very familiar with experimental research themselves of the translational procedures involved in designing, carrying out, and interpreting this kind of research. With his illustrated "Cycle," Schleim proposes a template for analysis that can ideally be applied to other cases of experimental (neuro-) philosophy as well and that also invites people to reflect on the relation between philosophy and empirical research more broadly.

Central to Greene and colleagues' investigation, Schleim argues, was the psychological puzzle posed by different response patterns to different kinds of moral dilemmas involving the sacrifice of a smaller number of people to save the lives of a larger number, a difference that was in the end explained by differences in emotional responses – reminiscent of what Kauppinen called "proximal causes" – and even used to undermine the justification of some kind of moral theories while supporting that of others, in particular utilitarianism. However, as Schleim argues, these interpretations presume a couple of intermediary steps, such as a choice of experimental procedures and methods, carrying out the actual experiment, preprocessing and analyzing data, and interpreting them in a psychologically significant way, making use of inferences to the best explanation. Just as the

strength of a chain depends on the strength of its individual links, the strength of the whole "Cycle" depends on the strength of its constitutive parts.

In his conclusion, Schleim notes that in light of his neurophilosophical analysis, philosophers need not fear to lose their jobs due to the explanatory power of cognitive neuroscience, as once was suggested in a report accompanying the original publication of the moral dilemma task study. By contrast, just as it is the case with respect to philosophy of science in general, philosophers and scientists alike can – and perhaps even should – engage in a critical philosophy of experimentation to emphasize the individual choices, experimental limitations, and backgrounds of explanatory patterns to better understand the scope of the research and in particular the strength of the translational links connecting philosophy, psychology, and neuroscience.

## Possible Implications for Applied Ethics

From the perspective of neuroethics, the topic of this section is very abstract and theoretical and some may wonder whether it may have any implications for applied (neuro-) ethics at all. Although it is interesting in itself to understand how moral cognition, an essential human capacity, works and although the answers to this question may influence our understanding of what it means to be human, it is conceivable that the research might become relevant to a couple of applied questions, as the following examples are intended to show:

First, informed consent is an important issue in medical ethics and practice in general; it might be a particular challenge in the case of neurological or psychiatric/psychological disorders where the central decision-making structure may be impaired (Northoff 2006). Thus, finding out what the necessary and sufficient structures are for moral cognition may help to understand when a subject still is or is no longer capable of making an informed decision in a morally salient situation such as agreeing to undergo a potentially painful and risky medical treatment, perhaps even more so in cases where subjects are so much impaired that they cannot communicate any more in a normal manner, such as in a minimal conscious state (Jox et al. 2012). The issue of informed consent might be particularly problematic when the cognitive-emotional capacities required for it are precisely the target of the intervention and will only be sufficiently restored after the treatment.

Second, clinically as well as nonclinically, the bodily functions underlying moral cognition might themselves become a target of diagnosis and intervention. For example, in the history of psychiatry, some mental disorders, particularly psychopathy, had a moral connotation or were (and sometimes still are) understood as a moral disease (Werlinder 1978). The moral skills of psychopaths are a common topic of scholarly debate (Kennett and Fine 2008; Levy 2007; Sauer 2012), and it is very likely that there will be more research within moral psychology and neuroscience on that disorder. Already now, efforts are made to diagnose or identify psychopaths by means of brain scanners (Anderson and Kiehl 2012) and also to

screen and intervene (Rose 2010), that is, to treat them with the aim of curing their alleged moral deficits. It has even been discussed under which conditions research on psychopaths' psychological capacities might influence current legal practices of responsibility and legal insanity, emphasizing the emotional aspect prevalent in the moral neuroscience literature (Morse 2008). Besides the question whether this will ever be feasible, it goes without saying that the possibility of such interventions, affecting the deep core of someone's personality, needs critical discussion by ethicists, medical experts, and those primarily affected by the decisions alike.

However, even those who are not considered to be morally impaired might once be confronted with the option of intervening in the bodily functions underlying moral cognition, namely, third, as a form of moral enhancement (Douglas 2008). The previously mentioned moral dilemma task was actually already used in experiments to test whether subjects, when under the influence of a psychopharmacological substance like a selective serotonin re-uptake inhibitor, make "better" moral decisions than a control group treated with placebo (Crockett et al. 2010). It may be just as difficult as in the formerly mentioned case of moral treatment to find a means of moral enhancement that works, especially outside of a protected laboratory environment, and to agree on what a better moral decision would be in the first place. It goes without saying that any such attempts would have wide social ramifications.

Fourth and finally, it should not be forgotten that many moral psychologists, particularly those who carried out their research from a developmental point of view, developed ideas on improving moral education generally (Kohlberg 1984; Lind et al. 2010). If moral neuroscience truly adds to our understanding of moral decision-making, the developmental and situational conditions under which it functions, then we might expect this knowledge to contribute to the traditional pedagogical aim. This would not have to be restricted to pupils and students, but might even include preventive training to anticipate and avoid moral failure in governmental or private institutions.

As stated above, moral cognition as a research topic is abstract and theoretical, involving many conceptual as well as experimental challenges (Waldmann et al. 2012). However, this short and certainly preliminary list shows that there are related applied issues as well, some of which will probably increase in relevance as the field develops further. The last point for consideration mentioned here is the public as well as scholarly communication of the results, which often suggested that our moral decisions are made arbitrarily, that spontaneous emotional or intuitive responses may mislead us, even that we can be morally "dumfounded," that is, that we tend to cling to a judgment once made even after we learned that the reasons usually justifying this judgment do not apply in this particular instance. A popular case reported by Jonathan Haidt was an (imagined) example of incest that excluded all of the usual counterarguments, such as coercion, minority, or the increased risk of ill offspring, that people still considered as morally inappropriate after it had become clear that their justifying reasons do not apply in the presented case (Haidt et al. 1993).

However, other psychologists have warned that the widely disseminated findings of what John Kihlstrom called the "people are stupid" school of psychology,

presenting our decisions as emotionally driven, not based on reasoning, irrational, blinded by egoistic interests, and easily manipulated in experimental settings may constitute a limited and one-sided scientific account of what people are like (Kihlstrom 2004; Turiel 2010). The papers in this section emphasize that many central notions and experimental designs are preliminary; therefore, their results and interpretations are preliminary, too. Furthermore, much of the research is based on the subjects' trust in the experimenter, subjects who are often medicine, psychology, or neuroscience students and sometimes even participate in their own professors' experiments for mandatory course credit. The rational decision these subjects make is to actually participate in these experiments, in which they are often not informed or perhaps even misled about the experiments' aim – for otherwise the experimental manipulation might not work anymore. The behavior they subsequently show is also a function of the way the experiment is designed. The papers in this section suggest that there may be more than just one account to be told about what people are like, particular with respect to their moral cognition.

**Acknowledgments** I would like to thank Michael von Grundherr, Felix Schirmann, and Steffen Steinert for helpful suggestions to improve a previous version of this chapter.

## Cross-References


- ▶ Beyond Dual-Processes: The Interplay of Reason and Emotion in Moral Judgment
- ▶ Moral Intuition in Philosophy and Psychology
- ▶ Psychology and the Aims of Normative Ethics
- ▶ Real-Time Functional Magnetic Resonance Imaging–Brain-Computer Interfacing in the Assessment and Treatment of Psychopathy: Potential and Challenges
- ▶ Responsibility Enhancement and the Law of Negligence
- ▶ The Half-Life of the Moral Dilemma Task: A Case Study in Experimental (Neuro-) Philosophy
- ▶ The Morality of Moral Neuroenhancement
- ▶ The Neurobiology of Moral Cognition: Relation to Theory of Mind, Empathy, and Mind-Wandering
- ▶ The Use of Brain Interventions in Offender Rehabilitation Programs: Should It Be Mandatory, Voluntary, or Prohibited?


## References


Anderson, N. E., & Kiehl, K. A. (2012). The psychopath magnetized: Insights from brain imaging. *Trends in Cognitive Sciences, 16*(1), 52–60.

Berker, S. (2009). The normative insignificance of neuroscience. *Philosophy & Public Affairs, 37*(4), 293–329.

Crockett, M. J., Clark, L., Hauser, M. D., & Robbins, T. W. (2010). Serotonin selectively influences moral judgment and behavior through effects on harm aversion. *Proceedings of the National Academy of Sciences of the United States of America, 107*(40), 17433–17438.
Douglas, T. (2008). Moral enhancement. *Journal of Applied Philosophy, 25*(3), 228–245.
Gazzaniga, M. S. (2005). *The ethical brain*. New York/Washington, DC: DANA Press.
Gilligan, C. (1982). *In a different voice: Psychological theory and women's development*. Cambridge, MA: Harvard University Press.
Greene, J. D., Sommerville, R. B., Nystrom, L. E., Darley, J. M., & Cohen, J. D. (2001). An fMRI investigation of emotional engagement in moral judgment. *Science, 293*(5537), 2105–2108.
Greene, J. D., Nystrom, L. E., Engell, A. D., Darley, J. M., & Cohen, J. D. (2004). The neural bases of cognitive conflict and control in moral judgment. *Neuron, 44*(2), 389–400.
Greene, J. D., Morelli, S. A., Lowenberg, K., Nvstrom, L. E., & Cohen, J. D. (2008). Cognitive load selectively interferes with utilitarian moral judgment. *Cognition, 107*(3), 1144–1154.
Haidt, J. (2001). The emotional dog and its rational tail: A social intuitionist approach to moral judgment. *Psychological Review, 108*(4), 814–834.
Haidt, J. (2007). The new synthesis in moral psychology. *Science, 316*(5827), 998–1002.
Haidt, J., Koller, S. H., & Dias, M. G. (1993). Affect, culture, and morality, or is it wrong to eat your dog. *Journal of Personality and Social Psychology, 65*(4), 613–628.
Hume, D. (1777/1975). *Enquiries concerning human understanding and concerning the principles of morals* (3rd ed.). Oxford: Oxford University Press.
Jox, R. J., Bernat, J. L., Laureys, S., & Racine, E. (2012). Disorders of consciousness: Responding to requests for novel diagnostic and therapeutic interventions. *Lancet Neurology, 11*(8), 732–738.
Joyce, R. (2008). What neuroscience can (and cannot) contribute to metaethics. In W. Sinnott-Armstrong (Ed.), *The neuroscience of morality: Emotion, brain disorders, and development* (Vol. 3, pp. 371–394). Cambridge, MA: MIT Press.
Kahane, G. (2011). Evolutionary debunking arguments. *Noûs, 45*(1), 103–125.
Kahneman, D. (2011). *Thinking, fast and slow* (1st ed.). New York: Farrar, Straus and Giroux.
Kant, I. (1785/2011). *Groundwork of the metaphysics of morals: A German-English edition* (trans: Gregor, M., & Timmermann, J.). Cambridge: Cambridge University Press.
Kennett, J., & Fine, C. (2008). Internalism and the evidence from psychopaths and "acquired sociopaths". In W. Sinnott-Armstrong (Ed.), *The neuroscience of morality: Emotion, brain disorders, and development* (pp. 173–190). Cambridge, MA: MIT Press.
Kihlstrom, J. F. (2004). Is there a "People are Stupid" school in social psychology? *Behavioral and Brain Sciences, 27*(3), 348-+.
Kohlberg, L. (1984). *The psychology of moral development: The nature and validity of moral stages* (1st ed.). San Francisco: Harper & Row.
Levy, N. (2007). The responsibility of the psychopath revisited. *Philosophy, Psychiatry, & Psychology, 14*(2), 129–138.
Lind, G., Hartmann, H. A., & Wakenhut, R. (2010). *Moral judgments and social education*. New Brunswick: Transaction Publishers.
Littlefield, M. M., & Johnson, J. M. (2012). *The neuroscientificturn: Transdisciplinarity in the age of the brain*. Ann Arbor: University of Michigan Press.
McGuire, J., Langdon, R., Coltheart, M., & Mackenzie, C. (2009). A reanalysis of the personal/impersonal distinction in moral psychology research. *Journal of Experimental Social Psychology, 45*(3), 577–580.
Moll, J., & de Oliveira-Souza, R. (2007). Moral judgments, emotions and the utilitarian brain. *Trends in Cognitive Sciences, 11*(8), 319–321.
Moll, J., Eslinger, P. J., & de Oliveira-Souza, R. (2001). Frontopolar and anterior temporal cortex activation in a moral judgment task – Preliminary functional MRI results in normal subjects. *Arquivos De Neuro-Psiquiatria, 59*(3B), 657–664.

Moore, A. B., Clark, B. A., & Kane, M. J. (2008). Who shalt not kill? Individual differences in working memory capacity, executive control, and moral judgment. *Psychological Science, 19*(6), 549–557.

Morse, S. J. (2008). Psychopathy and criminal responsibility. *Neuroethics, 1*(3), 205–212.

Nadelhoffer, T., Nahmias, E. A., & Nichols, S. (2010). *Moral psychology: Historical and contemporary readings*. Malden: Wiley-Blackwell.

Northoff, G. (2006). Neuroscience of decision making and informed consent: An investigation in neuroethics. *Journal of Medical Ethics, 32*(2), 70–73.

Piaget, J. (1932). *Le jugement moral chez l'enfant*. Paris: LibrairieFèlix Alcan.

Pickersgill, M., & van Keulen, I. (Eds.). (2012). *Sociological reflections on the neurosciences*. Bingley: Emerald.

Pizarro, D. (2000). Nothing more than feelings? The role of emotions in moral judgment. *Journal for the Theory of Social Behaviour, 30*(4), 355-+.

Rose, N. (2010). 'Screen and intervene': Governing risky brains. *History of the Human Sciences, 23*(1), 79–105.

Sauer, H. (2012). Psychopaths and filthy desks. *Ethical Theory and Moral Practice, 15*(1), 95–115.

Sayre-McCord, G. (2012). Metaethics. In *The Stanford encyclopedia of philosophy* (Spring 2012 Ed.), from http://plato.stanford.edu/archives/spr2012/entries/metaethics/

Singer, P. (2005). Ethics and intuitions. *Journal of Ethics, 9*, 331–352.

Turiel, E. (2010). Snap judgment? Not so fast: Thought, reasoning, and choice as psychological realities. *Human Development, 53*(3), 105–109.

Waldmann, M. R., Nagel, J., & Wiegmann, A. (2012). Moral judgment. In K. J. Holyoak & R. G. Morrison (Eds.), *The Oxford handbook of thinking and reasoning*. Oxford: Oxford University Press.

Werlinder, H. (1978). *Psychopathy: A history of the concepts: Analysis of the origin and development of a family of concepts in psychopathology*. Uppsala/Stockholm: Almqvist &Wiksell International.