A. General Information

Theme: Neurolaw: Ways forward for Neuroscience, Justice & Security

Date: 25. & 26. November 2019

Scientific committee: Dr. Dave van Toor, Universität Bielefeld/Open Universiteit Nederland
Prof. Dr. Gerben Meynen, Utrech University
Prof. Dr. Tijs Kooijmans, Tilburg University
Dr. Tom Douglas, Uehiro Centre, Oxford University

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B. Summary:
The scientific field that combines neuroscience and law – the field is often referred to as NeuroLaw – is a new and rapidly developing field investigating the impact of neuroscience on law. Neuroscientific techniques are already being used in some criminal proceedings. Moreover, their use is increasing rapidly and this is expected to continue. However, such applications of neuroscience are not yet adequately regulated. For example, there is the potential for these techniques to violate evidence law and human rights, but regulations to prevent this are not yet in place. There also arise some practical difficulties: when prosecutors, lawyers, jurors and/or judges are confronted with neuroscientific evidence, it remains to be seen if these are interpreted correctly. On the other hand, there is the potential for neuroscience to enhance the accuracy and objectivity of determinations of guilt and assessments of risk. However, as is customary in a young field of science, there is still a great deal of uncertainty about aspects of the interaction between neuroscience and law. The central question of our workshop is as follows:

In what ways can neuroscience contribute to a fair and more effective criminal justice system and how can a constitutional and (medically and ethically) justified use of neuroscientific information and insights into criminal (procedural) law be guaranteed?
C. Presentation of the theme

I. NeuroLaw: introduction

The scientific field that combines neuroscience and law – the field is often referred to as NeuroLaw – is hot. NeuroLaw is a new and rapidly developing field in which the impact of neuroscience on law is investigated. Several handbooks have now been published, both at conceptual and descriptive levels, and two doctoral theses in the area have been published in the Netherlands. Cornet obtained her doctorate on a (neuroscientific) dissertation on 'whether certain neurobiological factors can contribute to the prediction of the treatment outcome of detainees' with the inspiring title Brains Behind Bars and Van Toor obtained a doctorate on a (legal) dissertation, entitled A guilty memory?, answering the question of whether neuro-memory detection is an effective and efficient method of detection, and not in violation with certain human rights. Publications in NeuroLaw are pre-eminently interdisciplinary, with neuroscientists, lawyers, psychiatrists and psychologists, researchers as well as practitioners meeting to answer questions that cannot be answered by one discipline.

As is customary in a young field of science, there is still a great deal of uncertainty about aspects of the interaction between neuroscience and law. As mentioned above, neuroscientific techniques are already being used in some criminal proceedings. The use of these techniques is increasing rapidly and this is expected to continue. However, the use of neurobiological material and the use of different techniques are not yet adequately regulated. For example, there is the potential for these techniques to violate evidence law and human rights, but regulations to prevent this are not yet in place. There also arise some practical difficulties: when prosecutors, lawyers, jurors and/or judges are confronted with neuroscientific evidence, it remains to be seen if these are interpreted correctly. On the other hand, there is the potential for neuroscience to enhance the accuracy and objectivity of determinations of guilt and assessments of risk. However, as is customary in a young field of science, there is still a great deal of uncertainty about aspects of the interaction between neuroscience and law. The central question of our workshop is as follows:

In what ways can neuroscience contribute to a fair and more effective criminal justice system and how can a constitutional and (medically and ethically) justified use of neuroscientific information and insights into criminal (procedural) law be guaranteed?

II. The current state of NeuroLaw

Publications on the interaction between neuroscience and the law can be divided into four categories: (1)
Firstly, neuroscientific discoveries about the working of the mind and brain can have an impact on fundamental legal concepts. This opens the door to a top-down analysis exploring the implications of neuroscientific insights for the fundamentals of the legal system, and in particular the requirements for liability. This interaction leads to further philosophical and ethical questions – for example whether neuroscientific revelations will lead to a legal revolution, for example through informing our understanding of free will and criminal responsibility. If we are all “slaves of our brains”, should the concept of punishment, rooted in most constitutions, be abandoned in favor of mere preventive custody? Pardo’s & Patterson’s handbook answers several conceptual questions about the foundations of law and neuroscience. However, until now, no NeuroLaw revolution or major conceptual changes have occurred.

Secondly, in contrast to the top-down method, publications with a bottom-up approach can also be seen in the NeuroLaw field. The focus of this subfield is practical, and analyzes of the use of neuroscientific research in concrete cases. The bottom-up analysis involves research into the actual use of neuroscientific methods and results in concrete criminal cases, and identifies and ethically appraises the ways in which these methods and results influence decisions about legal questions of judges. As such, there have been publications of several criminal cases and analyses of these cases in the Netherlands, Canada, the United Kingdom, the United States of America and Italy. Neuropsychological research and neuroscientific technologies have been used in actual cases, for example to prove the suspect’s intent or his insanity.

Thirdly, there is an underlying tension between neuroscience and human rights. Neuroscientific technologies use the brain of a person as an object of discovery, and the technologies tend to be mentally and sometimes also physically invasive. This can implicate several human rights, such as rights to privacy, autonomy, bodily and mental integrity, human dignity and health. In several publications, human rights scholars discuss how the (compulsory) use of neuroscientific techniques should be regulated as not to violate any human rights. For example, Spranger researched the use of neuroscientific techniques in regard to the German Constitutional Code. This perspective is predominantly present in the NeuroLaw

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publications of applicants Van Toor and Kooijmans. On the other hand, applicant Douglas has sought to identify cases in which invasive neurointerventions could be used without infringing moral rights.

Lastly, neurocriminology can be categorized as a sub-discipline of criminology and NeuroLaw. It applies neuroscience techniques to probe the causes and cures of crime. Neurocriminology studies the makeup and composition of the brain and looks for correlations between characteristics of the brain and criminal behavior. For example, neuroscientific research can prove valuable information regarding the risk the suspect or the offender poses to reoffend. This information can for example be used for bail, sentencing and parole decisions. Applicant Meynen participates in the international debate on the legal implications of neuroscientific findings in this field. Meynen examines the way in which neuroscience can influence the insanity defense, and he is involved in research into the ways in which neuroscientific techniques can contribute to forensic diagnostics and to the (medical) ethical questions related to the use of such techniques. It appears that this NeuroLaw perspective is predominantly in Germany. For example, Markowitsch, Müller and Müller and colleagues described the possibilities to use neuroscientific insights in sentencing decisions.

From our point of view, it is of imminent importance to investigate the possibilities and legal consequences of the use of neurobiological information in criminal law. The importance of this topic is internationally recognized. Particularly in the United States of America, the scientific debate on NeuroLaw is increasingly being conducted and financed on a large scale, for example by the MacArthur Foundation. In European countries, including England, Italy, and the Netherlands, the scientific NeuroLaw discussion has also started in recent years. It is important to further develop this discussion and to generate insights about the possibilities and the effects of neuroscientific developments in an European perspective, because neuroscientific findings and new technologies can contribute to a more effective and efficient criminal law

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(neurocriminological perspective). This is desirable in the context of striving for a safer society, but not against all costs (human rights perspective).

What is the significance of neuroscientific developments for actual criminal procedures? Neurotechnology is increasingly being used in criminal law frameworks. These include the use of brain scans, such as fMRI, and the collection and analysis of genes that would be associated with an increased risk of undesirable behavior. But there is also a lot of discussion about the usefulness and necessity of using such techniques, and also about the correct methodology. For example, techniques – such as the Concealed Information Test or memory detection – exist that measure the suspect’s recognition of a specific object. These techniques can be valuable in a criminal context, for example to find out whether the suspect recognizes the murder weapon, the victim and the crime scene. Such recognition can say something about the suspect’s involvement in the crime in question.

At the same time, it is argued that the results of this neurotechnological test should not be overestimated, because the results do not say anything about guilt or innocence: empirical findings that certain brain areas are involved in planning and caring out certain behaviour are not the same as a normative assessment about a person’s intent. In addition, the test results can to a certain extent be manipulated by the person being tested.

Neuroscience techniques can also contribute to the diagnosis of certain syndromes, such as dementia and brain tumours. At the same time, the usefulness of such findings for answering the relevant legal questions is doubted again. Moreover, neuroscientific research shows that certain brain characteristics or damage can be predictive for aggressive behaviour. Currently, the forensic psychiatrist is dependent on the story of the suspect for his opinion on the accountability and danger of a suspect. If a suspect (or detainee) does not cooperate with the forensic evaluation, an adequate diagnosis is difficult and sometimes not possible at all. Neuroscientific techniques can make research into the state of mind less dependent on the behaviour of the person concerned. Thus, in principle, the brain of a suspect can be scanned, or his genetic material analysed, without the suspect having to speak a word.

Another relevant technique is deep brain stimulation, in which certain diseases can be remedied or controlled by means of electrodes in the brain. Such techniques can be valuable for the (renewed) treatment of convicted patients in whom the psychological disorder present leads to an increased risk of future danger. Another form of shaping an individual's behaviour in the context of resocialization, is the use of non-invasive neuro-enhancements. German scholar Christoph Bublitz examines the legal implications of coercive use of such neuro-enhancement methods from a human rights perspective. There is also increasing attention for pain detection with brain scans, which can be meaningful in the context of the compensation measure. In the context of his PhD project, Sjors Ligthart – with applicants Kooijmans and Meynen as supervisors – examines the legal implications of the coercive use of four different neurotechnologies in all stages of criminal law, with an important focus on European human rights.

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27 Christoph Bublitz, “The Soul is in the Prison of the Body” – Mandatory Moral Enhancement, Punishment & Rights against Neuro-rehabilitation, in David Birks & Thomas Douglas (eds), Treatment for Crime: Philosophical Essays on Neurinterventions in Criminal Justice (OUP 2018 (forthcoming)).
III. Goal of the workshop

As mentioned above, insights in the working mechanism of the brain, and the possibility to research the brain *in vivo*, have boomed in recent years. This have led to the introduction of neuroscientific evidence in actual court cases, without a thorough legal understanding if, and how, certain neuroscientific evidence should be interpreted in a case of law. Following this, in the workshop we will discuss the question: **In what ways can neuroscience contribute to a fair and more effective criminal justice system and how can a constitutional and (medically and ethically) justified use of neuroscientific information and insights into criminal (procedural) law be guaranteed?**

The discussion will be based around three themes:

1. **Reliability:** Are the results of neurotechniques reliable enough to be admitted as evidence in a criminal case? This question touches both neuroscience and criminal law. Is this a task for the expert to bring forth at trial, or should judges investigate the reliability themselves? The aim is to answer this question in a differentiated manner: which technique can be used in which circumstances and how reliable should a technique be to be admitted as evidence in criminal proceedings?

2. **Interpretation:** As mentioned above, neuroscience is an empirical science which tries to answer questions about normal and abnormal brain functioning, but the law and cases of law are (at least partly) normative. Whereas question 1 is related to the question of which ways lawyers should appreciate neurobiological material and what the role of experts should be. The results of complicated neuroscientific techniques, which in themselves are sufficiently reliable for application in criminal law, can lead to complex interpretative questions. This applies all the more if neuroscientific technologies are combined with artificial intelligence, whereby the realization of measurement results is not transparent. In this context, it is also important to draw attention to the persuasiveness that comes from 'neurodata', such as an image of the brain, and to what extent this level of persuasiveness can be scientifically substantiated.

3. **Coercion:** A third important question concerns the possibility of using neurotechniques forcibly in criminal proceedings, for example against suspects, witnesses, victims and convicts. This question touches on fundamental rights, such as the right to freedom of thought, the right to respect for physical integrity and private life and the right to a fair trial.

IV. Program

**Monday, 25.11.2019: The reliability of neuroscientific technologies and normative legal rules**

- **09.00 – 09.30:** Opening statement Prof. Dr. Michael Lindemann
- **09.30 – 12.45:** Reliability of techniques in light of rules of evidence
  - Possibilities and limitations of brain imaging in forensic psychiatry
    - *Prof. Dr. David Linden*
  - Inferential reasoning: from research question to conclusion, and from conclusion to evidence?
    - *Dr. Pim Haselager and Dr. Dave van Toor*

15 minute break
- Neurolaw and Responsibility for Action
  
  *Prof. Dr. Bebhinn Donnelly-Lazarov*

- Claims of diminished capacity as a partial defence
  
  *Dr. Paul Catley and Dr. Lisa Claydon*

12.45 – 13.30: Lunch

**13:30 – 16.45: Neuroscience in court: mind-reading and interpretation**

- Developments in brain lie detection and memory detection: a (neuro)psychological and legal perspective
  
  *Dr. Ewout Meijer and Dr. Dave van Toor*

- Privacy and neurotechnologies: Need for new regulations?
  
  *Dr. Christoph Babitz*

15 minute break

- Conceptual challenges for criminal law and the cognitive sciences
  
  *Prof. Dr. David Roef*

- Criminal law and neuroscience: Possibilities and perils
  
  *Prof. Dr. Tijs Kooijmans, Prof. Dr. Gerben Meynen & Sjors Ligthart LLM*

**Tuesday, 26.11.2019: Application in forensic psychiatry: rehabilitation, diagnostic and prevention**

**09.00 – 12.00: Neuroscience, forensic diagnostics and legal insanity: interpretation and coercion**

- Direct Brain Interventions in Criminal Rehabilitation
  
  *Dr. Thomas Douglas*

- Reading brains using fMRI and machine learning: Where are we, where are we going?
  
  *Prof. Dr. rer. nat. John-Dylan Haynes*

15 minute break

- Neuroscience in forensic psychiatry: Ethical and legal implications of using neuroscience for dangerousness assessments
  
  *Dr. Georgia Gkotsi*

- Basic neurobiological measures in criminological research & NeuroLabNL
  
  *Dr. Katy de Kogel*

12.00 – 12.45: Lunch

**12.45 – 15.45: Neuroscience, criminal behavior and prevention**

- Neuroprediction of future rearrest and biological interventions to reduce offending
  
  *Dr. Farah Focquaert*
V. Speakers

1. Prof. Dr. David Linden (University of Maastricht);
2. Dr. Thomas Douglas (Oxford University, Uehiro Centre for Practical Ethics);
3. Prof. Dr. rer. nat. John-Dylan Haynes (Bernstein Center for Computational Neuroscience Berlin);
4. Dr. Christoph Bublitz (University of Hamburg);
5. Dr. Lisa Claydon (The Open University Law School);
6. Dr. Paul Catley (The Open University Law School);
7. Dr. Ewout Meijer (Maastricht University);
8. Prof. Dr. David Roef (Maastricht University);
9. Dr. Pim W.F.G. Haselager (Donders Institute for Brain, Cognition and Behaviour, Radboud University Nijmegen);
10. Dr. Dave van Toor (Universität Bielefeld; Open Universiteit Heerlen);
11. Dr. Katy C.H. de Kogel (Scientific Services of the Dutch Ministry of Justice);
12. Prof. Dr. Gerben Meynen (Universiteit Utrecht);
13. Prof. Dr. Tijs Kooijmans (Tilburg Law School);
14. Sjors Ligthart LLM (Tilburg Law School);
15. Prof. Dr. Bebhinn Donnelly-Lazarov (University of Surrey);
16. Dr. Georgia M. Gkotsi (University of Athens);
17. Prof. Dr. Farah Focquaert (Ghent University).
D. Curriculum Vitae scientific committee

Dr. Dave van Toor

Dave van Toor, Wissenschaftlicher Mitarbeiter, Fakultät für Rechtswissenschaft, Lehrstuhl für Strafrecht, Strafprozessrecht und Kriminologie, and Assisant Professor of Criminal Law and the Open University Heerlen in the Netherlands. Studied both Law (LLB; LLM) and Psychology (BSc). Promotion to Dr. on 20th of April 2017 at the Radboud University Nijmegen on a doctoral thesis on a human rights perspective on the use of neuroscientific memory detection in criminal cases.

Publications in NeuroLaw:


Prof. Dr. Tijs Kooijmans

Tijs Kooijmans studied law. He obtained a PhD degree in law after succesfully having defended his doctorate thesis about criminal measures (such as the hospital order). Since 2010, he is a full professor of criminal law at Tilburg University. In addition, he is a substitute judge in the s-Hertogenbosch Court of Appeals. His research interests include forensic psychiatry. He supervises the PhD research of Sjors Ligthart about coercive neuro-testing. One of his publications is T. Kooijmans & G. Meynen, ‘Who Establishes the Presence of a Mental Disorder in Defendants? Medicolegal Considerations on a European Court of Human Rights Case’, Frontiers in Psychiatry, October 2017, Volume 8, p. 1-6.

Prof. Dr. Gerben Meynen

Gerben Meynen studied medicine, philosophy, and theology. He received a PhD in philosophy as well as in medicine, and specialized in psychiatry. He is professor of Forensic Psychiatry (Utrecht University) and endowed professor of Ethics and Psychiatry (VU University Amsterdam). Since 2006, he has been a clinical psychiatrist at GGZ inGeest, Amsterdam. His research interests include neurolaw and legal insanity. Selected publications:


**Dr. Tom Douglas**

Tom Douglas trained in clinical medicine (BMedSc MB ChB, Otago, New Zealand) and philosophy (BA DPhil, Oxford) and works primarily in philosophical bio- and neuro-ethics. He is currently Senior Research Fellow and Director of Research and Development in the Oxford Uehiro Centre of Practical, Faculty of Philosophy, University of Oxford; Editor-in-Chief of the Journal of Practical Ethics; Principal Investigator on the Wellcome Trust-funded project 'Neurointerventions in Crime Prevention: An Ethical Analysis'; and Lead Researcher in the Oxford Martin Programme on Collective Responsibility for Infectious Disease.

**Selected publications in Neuroethics/Neurolaw:**


• Pugh J, Douglas T, ‘Neurointerventions as Criminal Rehabilitation: An Ethical Review’, in J Jacobs and J Jackson (eds) *The Routledge Handbook of Criminal Justice Ethics* (Routledge, 2016);

• D’Hotman D, Pugh J, Douglas T, ‘When Is Coercive Methadone Therapy Justified?’, *Bioethics* 2018; 32(7): 405-413;


• Douglas T, ‘Refusing to Treat Sexual Dysfunction in Sex Offenders’, *Cambridge Quarterly of Healthcare Ethics* 2017; 26(1): 143-158;

• Douglas T, ‘Nonconsensual Neurocorrectives and Bodily Integrity: A Reply to Shaw and Barn’, *Neuroethics*, published online 2016, forthcoming in print;
