# Neuroscience, Law and Beyond International Conference

## Abstracts Booklet

**19-20 April 2018**

**MEF University**

**Ayazağa, Istanbul, Turkey**

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**PROGRAMME**

**19th April Thursday:**

**10:00-10:30**

**Opening Speech**

**10:30-13:30**

***Panel 1: Human Nature, Consciousness and Rationality***

***Discussant:*** Oğuz Polat (Acıbadem Un. – MEF Un.)

**Scott Vrecko (King's College London)**

*Posthuman Consciousness: Living systems, Planetary Awareness, and Global Kinship*

**Gül Kızılca Yürür (Altınbaş Un.)**

*Naming as a constitutive linguistic act: The experience of posession, as lived in the life world of Dersim Alevis. A phenomenological approach to anthropology of consciousness**

**Hakan Gürvit (İstanbul Un.)**

*Human Existence Relies Largely on Unconscious Mental Processes: Lessons from Normal and Disordered Cognition*

**Spyros Antonelos (MEF Un.)**

*Neurobiological aspects of decision making within Mediation processes*

**15:00-18:00**

***Panel 2: Memory and Consciousness, Law and Physiology***

***Discussant:*** Ozan Erözden (MEF Un.)

**Ertan Yurdakoş (Altınbaş Un.)**

*Neurophysiology of emotions***

**Güven Güzeldere**

*Fundamental Concepts in the Neuroscience-Law Interface and the Future of Neuro-Law**

**Öget Öktem Tanör**

*Memory***

**Tade Matthias Spranger (Bonn Un.)**

*Lie detection, mind reading and fMRI in courtrooms*

**20th April Friday:**

**10:00-12:00**

***Panel 3: Normative Order, Society and Psychology: Terror Management Theory***

***Discussant:*** Demet Başar (MEF Un.)

**Markus Quirin (University of Salzburg, Austria)**

*Personality Neurodynamics: An Integrated Systems Approach Towards Psychological Functioning and its Application to Coping with Mortality Threat*

**Hayal Yavuz Güzel (Hacettepe Un.)**

*Threats to Self and Defense: Mortality, Uncertainty, and Ostracism* ***

**Müjde Koca Atabey (İstinye Un.)**

*Alternative explanations to the basic assumptions of TMT: Loss anxiety, disability salience & Gezi Park Protests*

**Müjde Peker (MEF Un.)**

*Procedural fairness judgments in the face of mortality salience and uncertainty: Impact of group identification*

**13:00-15:00**

***Panel 4: Biology, Evolution and Law***

***Discussant:*** Müjde Peker (MEF Un.)

**Ejder A.Yıldırım (Bakırköy Mental Hospital)**

*Emotional Systems, Survival and the Social Psychological Projections***

**İlker Küçükparlak**

*The Evolution of Fairness***

**Ozan Erözden (MEF Un.)**

*Regulated Social Order and Evolutionary Adaptation******

**Güçlü Akyürek (MEF Un.)**

*Positivist Trend in Criminology******

**15:30- 17:30**

***Panel 5: Artificial Intelligence, Medical Technologies, Ethics and Law***

***Discussant:*** Tuna Çakar (MEF Un.)

**Yeşim Işıl Ülman (Acıbadem Un.)**

*An Ethical Approach to Artificial Intelligence in Medicine*

**Çağlar Ersoy**

*Rules of Algorithms and the Future of Law******

**Uğur Sezerman (Acıbadem Un.)**

*Omics Technologies, Big Data Analyses, Personalised Medicine and Its Ethical Problems**

**Yağmur Denizhan (Boğaziçi Un.)**

*Artificial intelligence and the Subject of the Law*

***: These talks will be held in Turkish**

## CONCEPT PAPER

### Rationale

Neuroscience is an emerging multidisciplinary field that has already dissolved a good deal of well-established boundaries between natural and social sciences. Its aspiration to reveal neurobiological structures underlying motor activities and cognitive abilities sets new horizons in understanding, inter alia, causes and patterns for social behavior. Hence law, as a tool used by all kind of human societies –primitive, traditional, modern alike- to regulate behavior, falls within the scope of neuroscience. Interaction between law and neuroscience has been a topic of scholarly interest for more than two decades now, already acquiring the status of a sub-discipline labelled as "neurolaw".

Potential impacts of neuroscientific advances on the practice and theory of law are assessed from two different perspectives: On the one hand, scholars try to incorporate flourishing neuroscientific methods and knowledge in the field of law while conserving basics of modern legal systems as they are. More precisely, in this first perspective, scholars try to make use of neuroscientific research as if it merely consists in advanced forensics, i.e. a source which provides practitioners of law with additional material to be used in adjudication. On the other hand, a debate is conducted on whether or not neuroscientific developments constitute a real challenge to fundamental concepts that govern modern legal systems. Scholarly works falling in this second category endeavor to foresee how deep progress in neuroscience would affect current conception of "human nature" by altering or discarding our understanding concerning such concepts as free will, consciousness, mental states, etc. If we acquire through neuroscience a better understanding of brain mechanisms which are plausibly determining human behavior, some argue, modern legal systems will have to renounce all concepts that inherently presuppose a human agency acting under the guidance of mental states (desires, beliefs, intentions, wills, etc.) shaped by consciousness.

The conference "Neuroscience, Law and Beyond" aims to bring the relationship between law and neuroscience under scrutiny from the latter perspective. As the debate involved in this framework relates not only to technical issues pertaining to the use of neuroscience in courtrooms, but also to a wide range of philosophical and theoretical points, it offers broader opportunities to bring together scholars from different disciplines over common subjects of discussion. In the conference, main topics that touch directly to theoretical aspects of

neuroscience-law interaction, as well as technical aspects that relate to theoretical questions will be discussed in five panels.

**Panel 1: Human Nature, Consciousness and Rationality**

The idea that human beings are endowed with consciousness is one of the presumptions on which modern legal systems rely to define personality. Person, in the legal sense, has to have the ability to act consciously to bear the responsibility of his/her acts. Nevertheless, the accuracy of a conscious human agency has been challenged by neuroscientific research since 1980s. Such issues as whether it is possible to define a neurobiological mechanism that could be identified as consciousness or whether non-deliberate activities of central nervous system could be the sole cause of human behavior form topics of constant debate. This panel aims to address some contentious issues falling within this broad framework.

**Panel 2: Memory and Consciousness, Physiology and Law**

Neurobiology of memory and attention is a topic highly relevant for neurolaw, first of all, from a technical point of view. Law practice, especially adjudication, requires in many instances efforts to establish facts retrospectively, in which testimonies of all parties, including third-party eye witnesses, play a considerable role. To understand the neurobiology of memory and attention would certainly improve the capacity of assessing the accuracy of testimonies on past events. Nevertheless, to understand mechanisms through which sensory receptors process external stimuli and how this information is kept and recalled in the brain is important also in understanding the phenomenon of consciousness. By questioning the connection between conscious awareness and external world perception through senses, this second panel covers the topic discussed in the first panel with an additional dimension.

**Panel 3: Normative Order, Society and Psychology: Terror Management Theory**

Terror Management Theory assumes a positive correlation between one's adherence to normative values of the society in which s/he lives and his / her level of being exposed to the idea of mortality. This theory, which offers a specific perspective in exploring the link between

normativity of social order and human psychology, posits that to manage the potential for terror engendered by the awareness of mortality, humans sustain faith in worldviews which provide a sense that they are significant beings in an enduring, meaningful world rather than mere animals fated only to obliteration upon death. This panel aims to discuss the link between human psychology and normative order from this very specific angle, which will form an additional dimension to the generic perspective elaborated in the third panel.

**Panel 4: Biology, Evolution and Law**

The relation between normative order and social cognition is a widely-researched topic. The existence of a cognitive system that seems dedicated to specifically produce good reasoning about norms from an early age on provides some suggestive evidence that normative cognition is an adaptation. People learn and assimilate, both explicitly and implicitly, numerous norms. They are motivated to comply with them while expecting others to do the same. It has been revealed also that emotions are a key component of this cognitive architecture: norm abidance is not merely linked to a "rational" calculation of cost and benefit. Several negative emotions are triggered by norm violations, whereas people feel elevation to comply with norms. This fact offers another support for the claim that normative cognition is not an acquired feature, but rather an adaptation. Thus, to explore human cognitive, linguistic, and physical capacities that allow the formulation of general norms of social conduct may lead to evolutionary explanations on the emergence of social institutions regulating this conduct. This panel aims to question evolutionary roots of legal order in human societies, by evaluating its adaptive aspect from a psychological perspective.

**Panel 5: Artificial Intelligence, Medical Technologies, Ethics and Law**

The place that artificial intelligence (AI) occupies in everyday life is in constant progress. To think of legal problems which could be generated by activities of robots fulfilling tasks hitherto considered belonging solely to the realm of human activities is not a purely hypothetical exercise anymore. As the abilities of smart machines amplify in both quality and quantity, the necessity to regulate legal status of automatons and legal responsibility resulting from their performances becomes more and more evident. Since the AI is theoretically apt to be used in every sector of social life, such a legal framework should comprise not only technical points but also ethical issues. The fields of neuroscience and AI have a long and intertwined history,

driven by the assumption that better understanding biological brains could play a vital role in building intelligent machines. The two pillars of contemporary AI, namely deep learning and reinforcement learning, loosely translate biological neuronal communication into formal mathematics. But neuroscientific insights may be of great significance also in codifying ethical principles for the use of AI. In this panel, these topics will be discussed from various angles.

## ABSTRACTS

### Posthuman Consciousness: Living Systems, Planetary Awareness, and Global Kinship

***Scott Vrecko***

In this paper I explore the possibility that consciousness is not a stable ontological entity, but rather can be thought of as the sort of 'interactive kind' of phenomenon described by Ian Hacking: the ways that we think about, i.e. mentally construct, ideas about self and 'consciousness' may change the very nature of our consciousness. Synthesizing ideas from a number of interdisciplinary fields such as cybernetics, ecology, and science and technology studies, I develop a posthuman approach to the study of consciousness that attends to the 'extended' nature of consciousness systems, and their functional involvement of biological, technological, and cultural systems beyond the body proper. In order to avoid excessive philosophical abstraction, I develop these ideas by focusing on a concrete case study—namely, the emergence of a form of posthumanist, 'planetary consciousness.'

**Naming as a constitutive linguistic act: The experience of posession, as lived in the life world of Dersim Alevis. A phenomenological approach to anthropology of consciousness**

***Gül Kızılca Yürür***

The phenomenon of spirit posession in Dersim combines a narrative about human and nonhuman conciousness symbiotically interconnected with structured healing practices, basically ritual acts of establishing boundaries of the self through nominal linguistic patterns. The social organisation of ontological transformation, as exemplified in the 3 cases presented in this discussion, will serve to make visible the ambigious and contested ground between multiple layers of lived experience, in a specific material context. The case examples are supposed to present how through the linguistic act of naming, language becomes power, establishing boundaries between uncontrollable subjective affect, the embodied self as socially identified, and the nonhuman consciousness as individually imagined.

This act of casting out the nonhuman from human serves on the one hand to invoke unwritten social laws about what distinguishes and limits the human World. On the other hand, the process of casting out, through the agency of the healer, serves to alienate the subject from the totalizing, transformative sense of otherness. This discussion will conclude with a brief focus on the role of cultural context in the therapeutic management of chronic mental disease.

**Human Existence Relies Largely on Unconscious Mental Processes: Lessons From Normal and Disordered Cognition**

***Hakan Gürvit***

The awareness of thinking and verbal report of the phenomenal experience is the basic assumption of human existence, variously called as Cartesian cogito, subject, ego or self-consciousness in philosophy, psychology, as well as in common parlance. This idea that self-conscious human subject is the master of his own body and fully responsible of its actions was first challenged by the father of psychoanalysis Sigmund Freud, with his revolutionary discovery of the unconscious. This was the ultimate putsch that concluded the previous decentralizing revolutions of Copernicus and Marx that pulled out the human subject from the center of the universe and center of the society. If the subject is split into a conscious and an unconscious, than he is no more even in the center of his body. Freud's blasphemous ideas were challenged on the grounds that overly singular psychoanalytic experience can never be formalized and thus a proper science can never be established out of it. Yet, accumulating evidence coming from clinical neurology and cognitive neuroscience over the years taught us that a good majority of human mentation is indeed unconscious; implying that there are numerous kinds of information processing that are completed without awareness and directly influence our decisions and actions. There are groundbreaking cases in the history of clinical neurology. One of the first of these, Phineas Cage taught us that human subject is not stable in his body and can replace itself with a complete stranger within the same body. Henry Molaison taught us that learning entails mostly so-called "implicit" or unconscious processes, such as priming and conditioning, which are directly responsible most, if not all of our behaviors. Finally, a modern case, Elliott taught us that even though we retain the ability to solve most intricate moral dilemmas theoretically, in real life we can become an "acquired sociopath" after a strategically located brain damage. Prosopagnosic patients denying the recognition of a familiar face by verbal report have been further denied by their concurrent heightened autonomic responses as compared to unfamiliar faces. It is well-known that stimuli deriving from the neglected hemi-space of the contralateral neglect patients influence the decisions of them. Finally, split-brain research taught us that external commands that were addressed to the non-verbal right-hemisphere induced appropriate reaction, which can be interpreted causally with the command, but verbal report of the individual reaction was totally arbitrary implying as if the reaction was not externally driven but chosen at free will of the individual. The obligation to envisage a new human subject, after the discoveries of psychoanalysis and

neuroscience, who is not fully self-conscious of his deeds, yet still held accountable for them poses a challenge for a progressive legal system.

**Neurophysiology of Emotions**

***Ertan Yurdakoş***

The cortical and subcortical structures involved in expression of emotional life and emotions are gathered under the limbic system concept. Limbic System consists of limbic cortex, subcortical nuclei working together with the limbic cortex and the pathways connecting these structures to each other and to other regions of the central nervous system.

The word emotion derives from the word "emovere" which means moving towards the outside in Latin. Emotion, a term often used synonymously with feeling, is both direct and indirect behaviour that appears depending on internal or external stimuli and which involves both mental and somatic elements. Even if the stimulus that started it disappears, emotion will continue its existence for a long time. Emotional reactions have been preserved throughout the evolution of species, they are adaptive and help with survival and rejuvenation.

The words emotion and feeling have different meanings: Emotions are the sum of the physiological responses that develop when our brain is aware of positively or negatively charged stimuli. Primary emotions, which are congenital, pre-arranged responses, result from limbic circuits; primarily amygdala and anterior cingulate. Primary emotions lead to changes in cognitive functions, such as increase in general arousal in the central nervous system, attention, memory processing, and decision-making ability. Depending on the increase in endocrine and autonomic sympathetic system activities that develop together, there are somatic changes called "fight or flight" reactions.

Feeling is the conscious awareness of these physiological changes in the organism. When the connection between the emotional stimulus and the emotional body state is realised, emotions are formed. According to Paul Ekman (1979), there are six universal primary emotions: sadness, happiness, anger, fear, disgust, surprise. Secondary emotions, on the other hand, are learned through social interaction as the individual grows (Damasio, 1994). These are social emotions such as shame, jealousy, guilt. Although stimuli are still processed by limbic structures, limbic structures are no longer sufficient to support secondary emotions as prefrontal and somatic sensory cortexes also get involved. While damage to the limbic system damages the processing of primary emotions, prefrontal lesions damage the processing of secondary emotions.

The debate on whether we run away because we are afraid or whether we are afraid because we run away, which was raised by William James and Carl Lange in 1890 on the formation mechanisms of primary emotions, was reconsidered in the light of the developments in neurophysiology since the 1980s.

In recent years, studies on neurophysiology, neuropsychology and neuroimaging have provided a better understanding of limbic system functions, anatomical and functional connections between limbic circuits and prefrontal circuits. This, together with the mechanisms of the emotion formation, has brought the discussions back to the agenda. These developments in neuroscience have made it difficult to distinguish between primary emotion and secondary emotion, and new classifications of emotions have begun to emerge. Discussions in this area focused on the field of neurobiology, especially in the context of "negative emotion / positive emotion" distinction, especially on the neurobiology of anger, rage, aggression and violence.

In this talk, the “do we run away because we are afraid or are we are afraid because we run away?” discussion will be debated in light of Joseph LeDoux's (1989) connection between limbic structures in the central nervous system and the limbic structures of Antonio Damasio's Somatic Marker Hypothesis (1999). In addition, adaptive primary emotion and secondary emotion discrimination will be discussed in terms of defining aggression and violence in humans and other mammals.

**Fundamental Concepts in the Neuroscience-Law Interface andthe Future of Neuro-Law**

***Güven Güzeldere***

What are the possible contributions neuroscience can make towards a revision, perhaps a reconfiguration of present systems of law? Neuro-Law is going to transform Law, both in theory and in practice, according to proponents, because neuroscience presents us with radically revised conceptions of the human person, free will, consciousness, and responsibility. According to critics, on the other hand, because these traditional folk-psychological notions, constitutive of personhood and underlying present legal systems, are so well entrenched that, their revision in light of neuroscience is merely a fantasy.

In this presentation, I will argue for a middle-position between the two polar opposites. Our current understanding of personhood is like a photograph, mostly stable in its core, but blurry in the margins. While I don't expect neuroscience will (or, in the short run, can) turn upside-down the current norms of Law, I believe Neuro-Law is poised to provide a much more nuanced and accurate understanding of human agency in the relatively rare but nonetheless essential "marginal cases" regarding, e.g., cases of underdeveloped or diminished brains, clarifying the edges and thus presenting us with a better overall picture. Only then will we face the more interesting question of to what extent this "revision along the margins", i.e., an improved understanding of underdeveloped or diminished brains, can help improve the flaws in our core legal concepts regarding personhood and agency.

**Memory**

***Öget Öktem Tanör***

Memory is a living organism's storage of information regarding itself and its surrounding. While connecting our past to our present, memory enables us to be complete.

However, "memory" is not a monolith. There are various types of memory. The memory type that first comes to mind when we say this word, consists of different types with respect to temporal aspects; and also involves different memory processes.

Firstly, we can divide memory into two big groups, namely Declarative Memory and Nondeclarative Memory. Nondeclarative Memory has three main types: a) Conditional Learning (which includes both Pavlovian classical conditioning and operant conditioning), b) Implicit Memory and c) Procedural Memory. We all know about conditioning; we develop a certain response to a certain stimulus and this process continues thoughout our lives. Implicit memory is information that we are not aware of knowing. Because we are unaware of knowing these information, there is nothing such as "remembering" them but the fact that we have acquired this information implicitly "prepares us" to behave in a certain way when we face a certain situation (this "preparing us" is named as "Priming".). Procedural Memory, on the other hand, includes motor learning. Examples include behaviours such as learning how to ride a bike; how to tie a tie or a scarf. It is really difficult to express and put into words how to perform those learned behaviours; one cannot describe how those things are performed in the absence of them. However, it is quite easy to do those learned actions (e.g., riding a bike, tying your tie or scarf). Cerebellum and basal ganglia constitute the basis of procedural memory in the brain.

Declarative Memory is also called Explicit Memory. We are aware that we know the information stored here. We can remember, we can put into words and describe. Explicit memory has two components. One, constitutes our own life events and is named Episodic Memory or Autobiographical Memory. Other one is Semantic Memory, and consists of general knowledge and vocabulary knowledge. In Episodic Memory, we remember the time and space that an event took place. We can tell a story by remembering the event such as: "We were at Burgazada on Sunday, last August, …" On the other hand, in Semantic Memory, we do not remember when and how we learnt that information (for instance knowing that London is the capital city of England).

Explicit Memory can be divided into three in terms of the time period it spends in our brain. First one is Immediate Memory which lasts for only seconds. It is also called Sensory Memory, because it involves the processing and perception of sensory information which comes from our sensory organs. A lot of information comes to us every second and enters our Sensory Memory. The ones that are unimportant are forgotten immediately; important ones are transferred to the second storage, which is Short Term Memory. Information is stored in here for minutes. If we had transferred it here to use it, we forgot it after using it. It can also fall from short term memory if an unexpected important event interferes with it. However, if the information is valuable or something we would like to keep in our mind, we then transfer this information to Long Term Memory using a group of transfer mechanisms. Information can be stored here for at least hours, years or even forever. We know that Short Term Memory is processing like reflexive closed circuits and Long Term Memory is stored in forms of protein synthesis in the association cortices. Brain components that transfer information from Short Term Memory to Long Term Memory are bilateral structures called Hippocampi and medio dorsal nuclei in Thalamus. Long Term Memory storage is not like a passive storage. It continuously organises itself in light of new information; the cues that are necessary to reach stored information gets refreshed in light of this reorganisation. Again, it is Hippocampi that constitute the basis for this process called Consolidation. The place that Explicit Memory is coded and sits is posterior association cortices for Episodic Memory with right hemisphere as more dominant, and anterior temporal cortices for Semantic Memory with left hemisphere as more dominant.

We should also talk about Working Memory which has qualities that resemble both Short and Long Term Memory. Working Memory includes the time period that we use for keeping in mind all the new or old information we need in order to complete a certain duty.

We cannot remember all the information that is in Long Term Memory. However, if we are given a cue or presented with an option for the thing we were trying to recall at that time, we will reach that information through Recognition. The Retrieval and Recall of registered information in the memory is an active process. It requires focusing the attention on Long Term Memory storage, Scanning of the storage, reaching the target information and Recalling it. This requires the good functioning of maintenance of attentional matrix process. If this process has been damaged but the individual can still maintain his/her memory encoding process, s/he can recall only a certain portion of the learned information but s/he can reach the remaining information through the aforementioned Recognition. This gives us the opportunity to separate

Alzheimer's Dementia and other dementias in the clinic. Because pathology always begins in Hippocampi in Alzheimer's Dementia, the patient experiences trouble in the ability to encode information. Even if we check for Recall and Recognition, since the patient did not encode all of the information, we realise that s/he could not access all of the information, because s/he did not encode it. Other dementia patients encode all of the information since their hippocampi is intact but they have an impairment in their attentional matrix. When we ask them to remember the information they learnt, they can Recall very small amount of it but they can reach all of the remaining information through Recognition.

Amnesias may develop after various diseases, vascular events or traumatic brain injuries. Some of them occur as Anterograde Amnesia: remembering the past but being unable to encode the new. Some of them occur as Retrograde Amnesia: encoding the new but being unable to remember the past. On the other hand, some of the patients are both unable to encode the new and remember the past information: Antero Retrograde Amnesia. While not being able to remember the past may involve both Episodic and Semantic types of Explicit Memory, it is reported that some amnesias only affect Episodic or Semantic Memory.

Do things we remember always reflect the truth even if we think they do? I would like to talk briefly about "eyewitness testimonies", in which even though the witness thinks that they are telling the truth, they may give incorrect testimony that are not real. Studies shed a light to "false memory" topic. There are numerous experiments showing that, individuals who had been an eyewitness to a forensic event, can combine the information they have heard about the event (e.g., what they saw from police reports, heard or read from the media) before testifying in court, with what they witnessed and might believe that they have actually seen the former themselves and do their testimony with this belief. There have been numerous studies that used normal participants which showed these results. Also, when the witnesses were asked leading or tricky questions, it had been shown that the witness misremembered the event they had seen. Even the smallest change in the questions can affect the witness' response/testimony. With these questions, the witness may even be made to believe in seeing something that was never in the scene of the event. In the famous study conducted by E. Loftus, participants were shown a video of a car accident in which two cars crashed to each other. Afterwards, participants were divided into 5 groups and by using a different verb for each group regarding the car accident, they are asked to estimate the speed of the cars during the accident. For example (if we take three of the five groups' examples), one group was asked how fast were the cars going when they "bumped into each other", another group was asked how fast they were going when they

"hit each other" and a third group was asked how fast they were going when they "smashed into each other". As the verbs that emphasise the intensity of the accident change from mild to severe, the speed estimates of the experimental groups (in other words, the witnesses) also change from less fast to faster. It is understood that the severity in the verb that has been used, changed people's perception about the speed of cars. After this, Loftus designed a second study with 150 subjects: in the one minute film shown to the participants, a car went through a rural area and the last four seconds of the video showed a series of traffic accidents. Participants were allocated to three groups.

One group was asked how fast were the cars going when they hit each other, the second group was asked how fast were the cars going when they smashes into each other, and lastly the third group was not asked any questions. After a week passed, the participants were taken to interrogation without being shown the videos again. One of the questions they were asked was the question of whether "they saw any broken glass in the film". 16 participants out of 50 from the group that had been asked questions a week ago with the verb "smashed", 7 participants out of 50 from the group that had been asked questions a week ago with the verb "hit" and 6 participants out of 50 from the group that had not been asked questions claim that there were broken glass, though in the original film there had not been any broken glass. This and many similar studies show that, the interrogation techniques after the event, the words that are used and the information obtained can be combined and mixed with the event the individual had seen and lead to "false recalls". The phenomenon of remembering events that did not occur has great importance in the interrogation process of eyewitnesses.

**Memory and Consciousness, Law and Physiology - lie detection, mind reading and fMRI in courtrooms**

***Tade Matthias Spranger***

Neuroscientific methods can enter courtrooms via various channels: as scientific state of the art, as integrated part of expert opinions, or – most obviously – as lie detection or mind reading techniques. Notwithstanding the fact that many if not most options are still in their experimental stage, a recently published high-ranking paper highlighted the purported need for both ethical standards and legal restrictions: in particular with regard to artificial intelligence-based systems and brain–computer interfaces, respect for and preservation of people's privacy, identity, agency and equality should be addressed. But is there really a lack of regulation or legal standards? In my presentation, I will give a brief overview on legal challenges, but also on possible chances arising from neuroscientific methods, paying particular attention to selected jurisdictions and the ECHR framework.

My research, mostly "embedded" in interdisciplinary and international projects and cooperations, addresses both the foundation of neurolaw and specific legal implications of neuroscientific applications:

- Starting as an ethical discussion, the legal aspects of neurosciences developed into the new field of neurolaw. One more time, ethics gave the initial spark for legal discussions and regulatory efforts. However, because of its historical development, it is still not clear if neurolaw and neuroethics should be seen as two individual disciplines or as one. In this regard, I am particularly interested in the human rights dimension of international neurolaw.

- Neurobiological determinism is heavily discussed in the field of criminal law. It describes the theory that all decisions are defined in the individual's brain from the beginning and are not part of its active decisions. Consequently, the question arises if one is really guilty for his actions. My research in this topic concerns the question, if criminal law based on guilt is still an appropriate system assuming neurobiological determinism or if we need to change the conditions of penalty. This "Minority Report"-scenario shows strong implications for constitutional matters as well.

- Two interdisciplinary projects (sponsored, inter alia, by the German Ministry of Science and Education) dealt with the role media play for the popular understanding of neuroscientific methods. In the context of these projects, the participants produced several short films, which were distributed via internet.

- The generation of neuroscientific knowledge requires an avalanche of scientific projects and even trials using human subjects. Brain imaging techniques like functional magnetic resonance imaging (fMRI) tend to produce additional information, i.e. previously undiagnosed medical or psychiatric conditions that are discovered unintentionally. These so-called incidental findings may lead to legal risks both for the participant and the researcher. In several projects and publications, my group developed a legal framework in order to avoid these risks.

- In the context of the project "Psychiatric Neurosurgery –Ethical, Legal and Societal Issues", I am focusing on the legal aspects of psychiatric neurosurgery. The aim of psychiatric neurosurgery is to treat psychiatric disorders, which are not directly caused by brain diseases. For example with deep brain stimulation, patients with diseases like depression or Alzheimer have new treatment options which could increase their quality of live extremely. Alongside with those methods, unanswered legal questions arise. For example the enrollment criteria and handling of patients unable to consent, minor patients or forensic patients are new legal challenges. In this context I am currently examining the possibility of the application of international and national legal documents on this topic by legal comparison. In this interdisciplinary and international project, we are working with international researchers in ethics, medicine and psychology researchers.

- Brain–computer interfaces carry a high potential to increase the quality of a disabled person's live. With brain-computer interfaces the persons concerned have the possibility to communicate only by thoughts so that they are partly getting back their independence. But these extremely new and unexplored technologies need a legal framework that balances the rights of all parties involved: on the one hand, the German constitution calls upon the legislature to take all necessary steps to make sure the legal landscape

facilitates disabled person´s interests and rights. On the other hand, BCI has to be safe from a technical viewpoint; also, possible misuse has to be addressed.

- Brain-reading and mind-reading techniques fire the imagination not only of scientists working in the field, but also of security agencies. The legal assessment has to differentiate between techniques applied on a voluntary basis on the one hand and enforced applications on the other hand. Also, as far as procedural law is concerned, the technical reliability plays a pivotal role for the practical importance of "lie detection methods" etc.

**Personality Neurodynamics: An Integrated Systems Approach Towards Psychological Functioning and its Application to Coping with Mortality Threat**

***Markus Quirin***

I will present an integrative neurosystems model of self-regulation and personality that already has been used for explaining phenomena such as decision-making, identification with moral values, regulation of emotions and drives, rule-based versus intuitive moral, and free will. The theory of Personality-Systems Interactions (PSI) is based on the following notions: (1) All individuals have inherent (large-scale) cognitive brain systems that exert a specific set of functions helpful in different situations (e.g., during decision-making, planning, action, or threat detection). (2) The interaction of these neurocognitive systems determines experiencing and behavior. (3) Individual differences in the reactivity of these systems and their connections make up an individuals' personality and the degree of freedom in choice and behavior. Not least, (4) fixations in activating certain systems and according mindsets along with difficulties in flexibly switching between them constitute determinants of psychopathology including personality disorders. In the present talk I apply this model to explain ways of coping with mortality awareness including repression, identification with one's culture and its moral worldviews along with prejudice against outgroups, activeness, and self-growth, as well as their neural correlates.

**Threats to Self and Defense: Mortality, Uncertainty, and Ostracism**

***Hayal Yavuz Güzel***

Both terror and uncertainty management theories argue that people have increased needs to uphold and defend their cultural worldviews when they are faced with their mortality and personal uncertainty. Results of several experiments that were conducted in the United States show that mortality salience has a bigger impact on people's worldview defense reactions than uncertainty salience. But interestingly, other experiments that were conducted by uncertainty management theorists in the Netherlands reveal that uncertainty salience has a bigger impact on people's reactions than mortality salience. To explain these conflicted results, Van den Bos and I have designed an experiment in which uncertainty and mortality concerns have been investigated simultaneously.

We found that participants who thought about personal uncertainty responded with stronger negative affective reactions to an essay that violated (as opposed to bolstered) their cultural worldviews about basic rights of Turkish women than participants who thought about their mortality. More interestingly, our findings show that uncertainty salience manipulation did not instigate death-thoughts whereas some participants in the mortality salient condition reported some uncertainty related thoughts in two open-ended questions that used to manipulate mortality salience.

This last finding is especially important as it provides an insight into the social psychological processes that play a role in the mortality management process. For this reason, I have conducted an experiment as a part of my PhD. The aim of this experiment was to investigate the effects of mortality salience on the accessibility of uncertainty-related thoughts as assessed by means of response latencies to uncertainty- related words in a lexical decision task (vs. control words). I predicted that reminding participants of being ostracized as well as mortality would have an impact on the response latencies to uncertainty-related words. Based on the arguments of ostracism researchers, I can say that being ostracized threatens people's need to understand their world, controls how they should behave and confronts people with personal uncertainty. Moreover, Chen et al. (2010) noticed, "the impact of ostracism and the subsequent responses are partly attributable to the uncertainty that envelops it" (p. 291). But there is no experiment providing a direct empirical evidence of the effects of reminders of being ostracized on accessibility of uncertainty thoughts. To fill this void, the thoughts of mortality and ostracism have been manipulated and the accessibility of uncertainty-related thought has been

measured via a lexical decision task.

The findings reveal that reminding people of their mortality increases recognition of uncertainty words in the lexical decision task. In addition, salience of being ostracized also increases accessibility of uncertainty-related thought in the lexical decision task. Taken together, these results help make sense of the role of uncertainty-related thought in the psychology of mortality and ostracism effects.

**Alternative explanations to the basic assumptions of TMT: Loss anxiety, disability salience & Gezi Park Protests**

***Müjde Koca Atabey***

Terror management theory (TMT) suggests that the awareness of the reality that death is inevitable creates a potential for existential anxiety. According to mortality salience hypothesis, when people are reminded about death, they defend or validate their cultural worldviews. The literature argues that after thinking about their own death, people become polarized in terms of their beliefs to manage their existential fear of death. Death was regarded as a qualitatively and quantitatively unique phenomenon. I would like to talk about two studies, which challenge this phenomenon.

In the first study, participants were subjected to mortality salience, disability salience and control conditions. There were 217 participants with a mean age of 20.18. A 3 (Conservatism Levels at Time 1: Low, Moderate, High) X 4 (Manipulation: Mortality Salience, Control Salience, Blindness Salience, Paralysis Salience) between subjects analysis of covariance with gender as a covariate was performed on conservatism scores for Time 2.

For the participants, those with high conservatism scores on Time 1, as compared to the control salience manipulation, both mortality salience and paralysis salience manipulations led to higher Time 2 conservatism scores. However, for the blindness salience manipulation, Time 2 conservatism scores did not significantly differ from other types of manipulations. It is concluded that as well as mortality salience, paralysis salience was found to produce worldview defense reactions for the participants whose initial conservatism scores were high. In a qualitative follow-up study, the accounts of participants were analysed. When reminded about mortality, the participants reported less individual sadness than expected; whereas when the participants were reminded about paralysis, greater individual sadness was reported. The frequency of individual sadness experienced by blindness salience participants was not significantly different than expected. In addition, although mortality as a concept could result in quite a few positive accounts (e.g., going to heaven, feeling relief, eternal happiness), for the themes of blindness and paralysis there were no positive accounts reported by the participants. Everybody is expected to die but not everybody is expected to become disabled. If death is regarded as a convenient example for testing TMT then disability might be another one. Both cases involve a high degree of loss. On the other hand, we are living in a mortality salient world. Thus, it is not so difficult to make people aware of their own mortality. This is the case

especially in Turkey. While death is everywhere—on TV, in newspapers, on the road—disability is hidden. It is something embarrassing and may not easily imaginable. It is not as salient as death. It is discussed that in TMT studies, the experimental manipulation should be self-relevant. Any kind of loss manipulation that is moderately fearful, highly imaginable, and highly self-relevant is suggested to affect cultural worldview defence reactions.

The second study that would be mentioned is a theoretical one. The Gezi Park Protests started at the end of May 2013 to defend the destruction of a small park. Interestingly, the park that is neither large nor popular. The protests started with environmentalist reactions and acquired a political nature afterwards. Mortality salience hypothesis is used to explain these protests, since they include both the concrete and abstract forms of mortality. The concrete forms of death were the death of trees and the death of protesters themselves. The abstract forms of death, on the other hand, were the death of lifestyle from the protesters' perspective and death of exercise power from the government's side. It is possible to discuss the above-mentioned necessary conditions for an alternative experimental manipulation in TMT studies. It is concluded that the Gezi Park protests provided a concrete and real-life example of TMT. So, death is taken for granted in TMT because existential anxiety is the basis of the theory. However, rather than existential anxiety relating to self, the anxiety of losing what exists in relation to self might be the basis of that terror. So, it is concluded that TMT is a fruitful theory for analysing both research-based questions and real life circumstances.

**Procedural fairness judgments in the face of mortality salience and uncertainty: Impact of group identification**

***Müjde Peker***

People generally feel uncomfortable towards experiencing personal uncertainty about their attitudes, beliefs, feelings and perceptions. Personal uncertainty motivates individuals to engage in behaviour that seeks to reduce it. Previous research conducted on Uncertainty Management Theory (UMT, van den Bos et al., 2001) suggests that individuals are more sensitive to procedural unfairness after they have been primed with self-uncertainty. In these studies, the standard procedural fairness manipulation involved participants either being or not being allowed to voice their views about how much they should be paid relative to the other participants. In other studies, participants took part in a selection process and either all (accurate procedure) or only some (inaccurate procedure) of their test items were taken into account. Results showed that when personal uncertainty had been made salient, the fair procedures resulted in more positive and less negative affect whereas the unfair procedures led to more negative and less positive affect.

Researchers claim that individuals defend their cultural worldviews in general and become more sensitive to unfairness in particular following self-uncertainty because personal uncertainty and self-threats lead to the activation of the human alarm system. Supporting this claim, it was found that presenting alarm-related symbols (e.g., via watching an exclamation point) led to a brain activation pattern that shares areas (medial frontal gyrus, Brodmann area 9) with the brain regions that have been found to be active in personal moral judgment tasks.

On the other hand, Terror Management Theory (TMT, Greenberg et al., 1986) claims that individuals defend their cultural worldviews as a result of being reminded about their own mortality, rather than uncertainty. Researchers comparing the two theories found conflicting results. While UMT researchers who generally conduct research in The Netherlands found that the uncertainty salience was more strongly related to reactions to fair vs. unfair treatment, TMT theorists found stronger support for their theory in the United States context. However, these theorists did not focus on procedural fairness per se and it is not certain whether these results are due to cultural differences or not.

UMT researchers also investigated what happens when self-interest and fairness concerns conflict with one another. It was found that when individuals experience a self-threat, they react

more positively to arrangements of advantageous inequity than when not experiencing this threat. Although individuals are found to become more sensitive to procedural unfairness judgments towards themselves, no research has been conducted yet investigating how they would react towards procedural fairness towards an outgroup member when they experience uncertainty. Based on Uncertainty-Identity Theory (UIT, Hogg et al., 2010), which claims that under self-uncertainty, individuals' perceived entiativity of a group they are already members of increases, one can expect group members to show heightened identification with the ingroup after they have been exposed to uncertainty. Combining the predictions of UMT and UIT, one can also expect individuals to perceive the procedural unfairness directed at an outgroup member more positively following heightened ingroup identification.

In our preliminary study, our aim is to look at the effects of intolerance for uncertainty on procedural fairness judgments towards an ingroup (i.e., Turkish citizens), a high status outgroup (i.e., expats) and a low status outgroup (i.e., refugees). More specifically, we will be testing the mediating effect of ingroup identification (i.e., identification with being a Turkish citizen) on the relationship between intolerance to uncertainty and procedural fairness judgments. Our hypothesis is that individuals who are highly intolerant to uncertainty will be more likely to identify with their ingroup and this would in turn lead them to judge the procedural fairness directed at their ingroup and the procedural unfairness directed towards outgroups as more positive compared to individuals who score high on tolerance to uncertainty. We aim to present the preliminary results of this study in our talk.

In future studies, we aim to manipulate uncertainty or mortality salience instead of measure it in order to infer causal explanations. Moreover, the effect of uncertainty/ mortality salience on leader trustworthiness in relation to their procedural justice towards different groups would also provide valuable insights to understanding preference for leaders. TMT findings suggest that following mortality salience, individuals are more likely to prefer charismatic leaders who provide a radical vision that promises to resolve crisis at the expense of surrendering one's freedom, rather than a relationship-oriented leader who emphasises the need for leaders and followers to work together and accept mutual responsibility. Applying these findings to UMT, one can hypothesise that when individuals are under self-uncertainty, they would be more likely to see the leader as more trustworthy provided they identify with their ingroup and the leader behaves in a procedurally unfair way towards outgroup members.

In sum, linking UMT and UIT findings to explain how individuals react towards procedural unfairness following uncertainty could potentially show conditions under which procedural justice could be forsaken by individuals and their leaders, resulting in heightened trustworthiness of these leaders. On a more positive note, practising procedural fairness irrespective of group memberships can also reduce the stress levels of individuals during uncertain times (such as times of organisation, turmoil or reorganisations).

**Emotional Systems, Survival And Their Sociopsychological Projections**

***Ejder Akgün Yıldırım***

As with many other species and their ancestors, the development of the human brain happens through the interaction between the sensation of the outside world and the learning of its liveable side. This formation sets out with a simple algorythm, starting from a single cell organisms. To get closer? To move away? There has been a need for certain foundational determinants that would validate the act of getting close or moving away of the organism, based on the signals sensed from the outside world. This determinant would define whether the current situation is pleasant, meaning positive, or dangerous/negative. A process of desire, reinforced via hedonic endogenic agents, is responsible for creating many behavioural sets for the species from feeding to breeding, via enabling the act of learning and habituation. On the other hand, this system of hedonic motivation, hierarchically requires the approval of another system. This is the sensation of safety. The definition of safety is related to how threatening the environment, situation or event is deemed to be by the species.

When the relationship between anxiety and the autonomic nervous system is examined, it can be observed that anxiety is the dominant regulatory power between the two. In a way, anxiety is like a force that provides the calibration for the determination of the quality and the quantity of the links established between the organism and the outside world. Threats are related to events that are either to be experienced or that have already been experienced, therefore a trauma is either experienced, or it will be experienced. If there is a behavioral set of the organism that can be observed today which resulted from a stable information processing system, then it is assumed that this behavioral formation was accomplished in the past, because it was used to solve a problem in the past. Emotions are like evolutionarily advanced maestros, which have been created during the problem solving experiences of the past, and which today regulate the nervous system and its many complex processes. They determine which system will become on or off, and on the contrary to common belief, they are not simply the felt emotions of our everyday life, but rather they have cognitive, behavioural and emotional functions through the emotional state they create.

Emotions are defined under different definitions in various categories. Generally speaking, other than happiness/pleasure, emotions have negative contents such as sadness, surprise, anger and fear. In other words, the function of emotions are usually preparing the organism to an unpleasant situation. For instance, in the dangerous event of a person being attacked or being

in a fire or some kind of a natural catastrophe, the panic attack experienced is considered an adaptive and harmonic response, because it will enable the person to fight, run faster, have increased muscle force, more efficiently watch for signs of danger, not get distracted by signals unrelated to the danger. However if this attack is for no reason, not only will it have no advantage, but it might actually induce danger to the person. Such is the case for an employee who is preparing to speak to their boss and thinks about being scolded by him/her or of saying something wrong and these thoughts trigger panic attack due to fear and anxiety. The employee interprets the fear and anxiety as if s/he perceives the threat of a predator and this situation makes his/her speech even harder and possibly impossible. This system which comes out during moments of danger, can also work in an uncontrolled way in a social danger or can interpret an emotional situation that was adaptive in the past in a maladaptive way under today's circumstances. On the other hand, the reactions during trauma are still adaptive.

Another variable important for humanity is the fact it is a social organism that has evolved from its ancestors who have been living in groups for million of years. In big groups of thousands of individuals, emotional processing obviously works with an understanding of the group processes in the centre. Face to face definitions, latent, indirect yet easily decoded expressions, the tools which the group uses to maintain its existence, norms and protection, the system which the group uses to control itself and its members; all of this have very well affected the development of evolutionary insurances biologically. The theory of mind processes, the importance of eyes and face, meaning from the tone of voice, insinuation, abiding by non-written rules and other altruistic behaviours produce complex social behaviours that also include emotional systems. Anxiety, sadness, happiness and the like are determined more by social needs in a group rather than physiological needs.

The notion of justice, morality or contemporary attitudes, beliefs and behaviours such as sharing, destroying or holding a grudge could be better understood through evaluating emotional systems on a group level.

## Regulated Social Order and Evolutionary Adaptation

***Ozan Erözden***

The origins of human societies, more precisely the reason why humans form and live in societies has been one of the main topics of debate in political and legal philosophy until recently. Answers given to this question would serve, at the same time, as an introduction to efforts of promoting a certain politico-juridical model of social organization. In other terms, for the sake of formulating a solid rationale for the politico-juridical social order they praise, theoreticians would originate human social order from various sources such as divine will or human intellect, on solely speculative grounds. Nevertheless, thanks to a large set of new scientific evidences collected through the works of paleontologists etc., this topic ceased largely to be a speculative one. Now we know that hominids existed four million years ago and already then they lived in hordes. That is, human societies' origins are to be found in evolutionary processes, as it is the case for all social animals. There is, however, a distinctive feature of human societies, which separate them from social organizations of other species: juridicity.

All human societies, ancient or modern alike, are regulated through a system of norms, which are legitimized with references to a belief system and supported by sanctions to ensure enforceability. In this sense, to be equipped with a legal system is a universal and ancient trait of all human societies. A trait could be both ancient and universal either a) because it can be easily acquired by individual learning or by social learning or b) because its regular development is ensured by a developmental system. The latter case is the evidence this trait is evolved. Interiorizing norms belonging to a system and abiding with them is definitely not an ability easily acquirable by the individual, it rather requires a costly effort. Therefore, it is perfectly legitimate to inquire whether this is an evolved trait. To inquire whether a specific trait is evolved one would study its phylogenetic history. In our case this study would consist in examining the changes that took place in physiology and psychology of the ancestors of human kind in the course of evolution in order to have juridicity as a basic element of their social organization. Furthermore, it is also possible to inquire whether this trait is an adaptation. Not all evolved traits are adaptations. They may also be by-products of an adaptation or just simple evolutionary accidents. An adaptation is a specific evolved trait that occurred as result of natural selection. The claim that juridicity is an adaptive trait implies the claim that a selective force has driven its evolution.

The first part of this paper is dedicated to present some facts that support the claim that juridicity is an evolutionary adaptation. In the second part I try to formulate a hypothesis concerning the selective force which could be the reason why this trait has evolved.

Answers given to the question how altruistic behavior, observed in a number of species – especially in social ones – could be an evolutionary stable strategy constitute first steps to develop some arguments in favor of the claim that juridicity is an evolved trait. One of the widely-accepted explanations in this respect refers to reciprocity as the main factor that renders altruistic behavior evolutionary stable. In this framework, the existence of a neurobiological mechanism in humans activated during third party punishment (altruistic punishment) tasks is a remarkable fact. Third part punishment is punishment of a transgressor which is administered by a person or institution not directly affected by the transgression. This type of punishment is a human universal and is considered to be the essence of social norms. The emerging neuroscience of third party punishment permits to assert that this is a trait which emerged from older, much more widespread forms of second- party punishment, that is victims themselves retaliating against their own aggressors.

In a number of studies, it has been highlighted that human altruism is much more complex than in other species. Sole reciprocity, it is argued, would not suffice to make such a complex type of altruism an evolutionary stable strategy. Additional mechanisms that render human cooperation successful in the course of evolution are listed as follows: human cognitive, linguistic, and physical capacities that allow the formulation of general norms of social conduct; the emergence of social institutions regulating this conduct; and the psychological capacity to internalize norms.

This perspective leads us to study a human-specific cognitive ability: normative cognition. Normative cognition is supported by a set of cognitive abilities, such as learning and assimilating norms, to be motivated to comply with norms and also expecting others to comply with norms. Research in the field of evolutionary psychology reveals the connection between social emotions and norm-abiding behavior. Norm violation trigger social emotions such as shame and guilt. Accordingly, people feel elevation while complying with norms even if this compliance is costly for them. In addition to this emotional component, there are other facts which support the claim that normative cognition is an adaptation. The cognitive system that seems dedicated to specifically produce good reasoning about norms exists in humans from an early age, 3 years old children already are able to show this ability. On the other hand, juridicity,

as one of the distinctive features of human social organization, includes a feature which is necessary to render normative cognition evolutionary stable. As shown in how-possible models explaining how normative cognition could have been selected for during the evolution of hominids, this process requires mechanisms not only for sanctioning norm violations, but also for metapunishment (second-order punishment), that is sanctioning the behavior of norm compliers who do not strive for sanctioning norm violators. As a matter of fact, all human societies are equipped with rules or institutions which ensure metapunishment.

If juridicity is, as the above-mentioned suggestive body of evidences asserts, an evolutionary adaptation what could be the selective force which drove its evolution? My hypothesis with respect to this question is as follows:

I would like to start with working memory, which is fundamental to many aspects of human life such as learning, speech and text comprehension, prospection and future planning, and conscious reasoning, as well as overlapping heavily with fluid general intelligence. Although working memory in humans is a widely-researched subject, there is little knowledge on evolutionary roots of this domain-general subsystem of the mind. The reason for this is the lack of comparative studies studying working memory in humans and other primates. The debate on whether working memory exists only in primates or it could be found in all mammals is still inconclusive. Likewise, the extent of working memory abilities found in primates is debated. Nevertheless, whereas humans are by no means unique in having a capacity for prospection and future planning using working memory, it is very likely that they use working memory in a much more complex way than other species. We have to consider also that this human-specific way of working-memory functioning is accompanied by language faculty, which makes possible a totally stimuli free, abstract perception. All these factors may render humans the sole species which developed an awareness of mortality. One’s awareness that his or her death is imminent has been categorized in a number of theories as a serious threat to psychological integrity. Therefore, it could be hypothesized that this awareness constitutes also a threat to the existence of human species.

According to terror management theory, humans buffer existential anxiety caused by mortality salience through an individual's cultural worldview and/or sense of self-esteem, both of which closely connected with norm abidance. Terror management theory posits cultural diversity among social groups, each group having a different construction of values and norms and thus absence of normative universality. As a matter of fact, norms incorporated in the construction

of legal systems vary from one society to another. Nevertheless, there is a universal norm which exists in every society: prohibition of incest. This norm, considered by structural anthropology as the very basis of any social organization, exists universally at least in its core form: prohibition of mother and son sexual relation.

If juridicity is an adaptation which serves to overcome psychological disturbance caused by mortality salience, then to have the prohibition of incest at the center of this constellation makes perfectly sense. Without such a norm to conceptualize lineal kinship, which is essential to create a conception of a social alliance that transcends an individual's life span, would be impossible.

In sum my hypothesis is that juridicity is an adaptation for humans to circumvent an existential threat to the existence of the species. It is not possible to test the validity of this hypothesis in its integrality using present day neuroscientific techniques. But comparative studies examining possible links between working memory, time conception, awareness of mortality, and normative cognition in humans and other species may form a first step in this respect.

## The Positivist Trend in Criminology

***Güçlü Akyürek***

There are today two different schools on the basis of Criminal Law and Criminal Codes: Historically first, the Classical School and second, the Positivist School. The former emerged as a reaction to cruel and arbitrary penalties applied during centuries. It argues that a human is a rational alive being who has free-will. The social contract is on the basis of this School. Accordingly, crimes have to be in advance defined and also precisely drawn up. As another result, criminal codes have to be strictly construed. Thus humans can choose either the good or the bad. Offenders violate the social contract at the same time. Even if there is not any problem concerning people choosing the good, the others choosing the bad are punished because they wrongfully behaved. The penalty is in advance fixed. It is proportionally determined according to the crime. The deterrence is the only goal of punishing, because the human aware of the penalty applied after the commission of a crime gives up of committing any crime with his/her free-will. This School is focused on the crime, in other word, its definition and determination of its penalty, instead of the offender. Especially, "Essay on Crimes and Punishment" ("Dei Delitti e Delle Penne") written by 26 years old Italian author Cesare Beccaria in XIXth century is considered as a manifesto of this School. Beccaria argues against torture and arbitrary penalty and for the principle of equality and determination and application of penalties within a well-organised structure including law enforcement and courts. Nevertheless, the Positivist School emerged as a reaction to the Classical School and focused on the offender instead of the crime. It has a deterministic point of view and argues that biological, psychological or environmental reasons push a human into the crime. Thus, "some people are born criminals". Some followers of this School think that as criminality is a result of heredity and environment, some people are more prone to commit a crime rather than the others. Moreover, some Positivists made researches and surveys on prison inmates and they argued that people having some specific physical features were prone to criminality on the basis of common features of these prisoners. Italian authors, Lombroso, Garofalo and Ferri are founders and pioneers of this School. Lombroso who was a medical doctor at the same time, made researches supporting his ideas. At first, Lombroso argued that some people are born criminals, then he said that it could be 40 %. These three authors are founders of the criminology also. The Positivist movement constituted one of the most important mainstay of oppressive and discriminatory ideologies at the beginning of XXth century. The Positivist School does not accept deterrence. Furthermore, as every offender is different from each other, it is not possible to fix same penalty for everyone.

In fact, not the penalty but a security measure should be applied and the goal is the treatment. As Positivists deny free-will, they think that it is not possible to punish a person. But, he or she does an anti-social behaviour by committing a crime and thus creates "dangerousness" to society and should be either treated or segregated. Also, as the measure should be appropriate to features of the offender, positivists argue that the judiciary should have a large power of discretion on the contrary of the Classical School arguments. Today the Criminal Law is based rather on the Classical School. When people having free-will commit any crime, they wrongfully behave and they are punished and this is deterrent for the future. Nevertheless, the Positivist School also has a lot of impacts. For example, people suffering from a mental illness or children cannot be punished but it is possible to apply treatment measures to them. In the same way, individualisation of penalty and courts' power of discretion on fixation of penalty are now accepted. Courts have also the power to rule on alternative measures (such as suspension of sentence, alternative sanctions). Re-education and re-socialisation activities in prisons concerning prison inmates within the frame of treatment are one of the current impacts of the Positivist School.

**An Ethical Approach to Artificial Intelligence in Medicine**

***Yeşim Işıl Ulman***

Artificial Intelligence (AI) is a general term that implies the use of a computer to model intelligent behavior with minimal human intervention. AI is generally accepted as having started with the invention of robots. AI was officially born in 1956 to describe as the science and engineering of making intelligent machines. The term is applied to a broad range of items in medicine such as robotics, medical diagnosis, medical statistics, and human biology—up to and including today's "omics". The term originates from the Czech word *robota*, and it means biosynthetic machines used as forced labor. Da Vinci's writings and sketches of robots inspired this innovation. For instance, Leonardo Da Vinci's use of robotic-assisted surgery is named after him and *Da Vinci Robot* is used for complex cardiovascular, urologic and gynecologic surgical procedures.

AI in medicine has virtual and physical branches. The virtual branch includes informatics approaches from deep learning information management to control of health management systems, including electronic health records, and active guidance of physicians in their treatment decisions. The physical branch is represented by robots to be used to assist the elderly patient or the attending surgeon. This branch also comprises targeted nanorobots which stands for a unique new drug delivery system (1).

Bioethics deals with provisions concerning the importance of ethical considerations to clinical practice. It initially focuses on ethical issues relevant to clinical care, and concerned with the moral, legal, political, and social issues raised by medicine, biomedical research, and life sciences technologies. Bioethics, in academic field, focuses on how theoretical and practical aspects of medicine affect considerations such as special obligations or responsibilities of clinicians, and scientists what is valuable, good, right, etc. in the biomedical context and how one might go about providing systematic accounts of such considerations (2).

This paper will deal with the ethical implications of this emerging technology, Artificial Intelligence in Medicine by calling the need in a further reflection in view of values of beneficence and nonmalefficence of human health and wellbeing; autonomy and responsibility in scientific freedom for social welfare; respect to confidentiality and privacy.

**Sources:**

(1) Pavel Hamet, Johanne Tremblay, Artificial intelligence in medicine. Metabolism, April 2017; 69, Supplement:36–40.
(2) Viens, A., & Singer, P. 2009. What is Bioertics: Introduction. In P. Singer & A. Viens (Eds.), The Cambridge Textbook of Bioethics Cambridge, Cambridge University Press. New York USA, Third Printing , pp. 1-6.

**Rules of Algorithms and The Future of Law**

***Çağlar Ersoy***

Software and codes behind the software, become the law of our times. Even though the cyber world is attempted to be ruled by the laws of the real world, it is impossible to fully accomplish this. The basis and laws of this virtual reality come from codes.

However, most of us do not know how the codes work and how they make certain choices. Even creators do not know or do not understand the background mechanisms in systems which create their own way by virtual learning. At this point, the war between technology and law starts. Inevitably, on one hand, there is law where there is no place for ambiguity or which does not like gray areas and on the other hand, there is technology which likes to wander in undiscovered areas.

This is called "black box problem" and in order for law to live peacefully together with technology, this is one of the most important things to solve. This black box problem should be approached from two angles: First one is the quality of this data that feeds these boxes.

In computer science, there is a famous saying "garbage comes in, garbage goes out". This sentence clearly points out that when input is useless, the output will be useless as well. At this point, we should take into account the possibility that data which used in virtual learning might be missing, biased, fake, wrong or inapprehensible and we should make these "boxes" with right data, complete and unbiased since it is the base of decisions which affects human lives. Even if we succeed in this, since we cannot obtain data that is completely clear from social biases, we should have a strict supervision over the algorithms decisions and maybe should clean out all the social biases.

If we adapt the famous saying above, it would be something like "bias comes in, bias goes out". As can be seen, big data do not extinguish biases. The only thing we are doing right now is hiding this with technology. We should not allow this.

The second angle for the black box problem is the attempt to escape from the responsibilities by hiding behind this obscurity curtain mentioned above. Algorithms are not unbiased and definitely not transparent. However, individuals try to escape from the responsibilities and supervision by hiding behind the defense of objectivity or obscurity of big data.

At this point, we come across the term "mathwashing". Individuals are trying to escape responsibility with the help of a perception that the nature of algorithms is unbiased. With this same logic, by arguing that the decision making processes of these algorithms are way too complex to be explained, individuals are also avoid the problem of the appropriateness of these algorithms to law.

One does not need to be a medium to claim that this situation will not continue like this. The point that is disregarded here is that algorithms are also designed by humans and that it is humans that decide which factors will have how much importance. Although codes are the law of the virtual world, they are or should be subjected to change and supervision in the same way like the laws in the real world. This is something that is partially accomplished by the data protection regulation of the European Union. One of the most important exams that the contemporary law should make will be to establish this as a standard worldwide.

It should not be possible to claim that the decision making process is unbiased or that its logic cannot be explained because it occurs inside a box. Otherwise, we will be opening a door that leads to the rejection of responsibilities and in this case, it is humans that will get the biggest damage again. We should think twice before evaluating and aggrandising software which might lead to unpredictable consequences, as having free will.

The fact that these black boxes (meaning algorithms) are already especially under the operation of law enforces and judicial authorities, shows that we need to take an action immediately. While we develop artificial intelligence to think like a human and do human-oriented jobs, we should try not to make it resemble humans too much and pass on our bad sides. If we cannot accomplish that, at least we should not take human out of the decision cycle and scope of responsibility.

It is clear that neuroscience can lend a helping hand to law in order to establish a correct relationship between artificial intelligence and law. Although law might attach some outcomes to notions such as free will and consciousness, it is establishing these notions from basic definitions or some traditional agreements. For example, it accepts that the free will of an employee that is likely to be pressured by their employer will be damaged, but at this point but it does not and cannot make any universal definitions for freedom and willpower. Fundamentally, this is not the role of law either.

However, these basic definitions and agreements might not be sufficient when the focus is on technologies which can lead to complicated problems like artificial intelligence. As a result of the developments in the areas of medicine and technology in the last few years, discussions about personality had already started. With the agenda of artificial intelligence, it is being approached more widely.

Legists seem to be very enthusiastic to talk about topics such as what is intelligence and under which conditions can one argue that consciousness exists, but they are not aware that they are sailing close to the wind. Here neuroscience should step in and say stop! It is the role of neuroscientists to define these concepts and transform them in a shape that law can use scientifically.

If the processing of intelligence and the formation of consciousness could be revealed with certainty, legists will deal with the rest. However, it is wrong to take radical decisions until this stage is complete. When one looks at the research conducted on human-like robots as well as the faulty approach and perception directed towards this research, one can have a better grasp of the topic. We cannot define intelligence totally but we know and we are accepting that we are intelligent. By using the algorithms on robots that resemble us, we assume that they will also be intelligent or at least seem to be intelligent. This is nothing more than an illusion and it leads us to make wrong decisions.

The topic of personality is quite a complex area and when one looks at how it is applied to law, one can see that it leads to a bias for humans and to a privilege that is not applied equally under every circumstance. Especially when we attribute a legal personality to humans, we do it based upon a nonlawful reality of "being human". If we intend to intellectually prepare ourselves to the probability of a strong artificial intelligence, then in the future, we need to accept the idea that personality can exist in different levels instead of a clear divide between an existence and nonexistence of it. It seems like, as humanity, we need to make more of an effort to respect and recognise on a legal level intelligent beings that are different from our species.

Therefore, describing the concepts mentioned above might not be enough on its own to end these discussions. As we see in the example of legal person, the primary criterion for law will be to perceive these new "beings" and treat them as new "beings" in society. A possible "electronic personality" will be created due to societal as well as economic reasons.

Here, neuroscience will describe the concepts that will give direction to non- legal factors and if it succeeds, the duty of legists will be to crown this success with a legal frame. This will be a first because until now, law has only been for people and made by people. The possibility of a legal regulation and a legal personality for an intelligent being other than human has the power to write history again.

With the help of improvements in neuroscience, it is becoming possible to develop human machine interfaces and machinery add-ons. These developments lead to intense questioning and discussion about what is means to be human. We do not question the humanness of an individual that wears glasses. Is there a reason to question someone's humanness if this person was able to expand the biological limits of their visual sense through a lense technology? Neuroscience opens the doors to those discussions. It is open to discussion to what extent we can solve the mysteries that were unresolved for centuries or find solutions to problems like discrimination and inequality that are due to human nature through artificial intelligence, but this is the biggest opportunity we have had so far. At that point, moral and ethical considerations will also be vital and again neuroscience can help us to find the correct pathway.

Law is not a predictor for topics regarding the future. It should act like a wise person who aims to resolve issues with peace. Noone is expecting legists to write Star Trek scenarios but rather they are expecting them to regulate the relationship between "beings" in a consistent way when the reality of society is evolved as such.

In this talk, the legal outcomes of algorithms and artificial learning technologies will be discussed and suggestions for solutions will be proposed. Moreover, how the developments in neuroscience can influence law and help legists will be mentioned.

Zimmerman says that legal personality is nothing more than a fiction that serves our purpose.[1] As neuroscientists and legists, we need to find out what serves our purpose. This could be the most exciting part of this job. At least, until we meet with beings that are more intelligent than us and hear their decisions about us!

[1] Evan Zimmerman, **Machine Minds: Frontier in Legal Personhood,** 12 February 2015, U.S.A.

**Omics Technologies, Big Data Analysis, Personalised Medicine and Its Ethical Problems**

***Uğur Sezerman***

In today's world, it is possible to obtain data such as genome, transcriptome, proteome and the like thanks to the technological developments in next generation sequencing with a reasonable amount of time and budget. By comparing with data coming from healthy individuals, each of these data could be used to determine the process through which an illness is born, develops and how it should be treated. As a result of omic research conducted on different patient groups, it is truly possible to reach big data, define them with advanced AI methods, understand the mechanisms through which an illness develops on different individuals and determine the risk factors.

However, these information bring with them a lot of ethical issues. It is possible to identify an individual based on their information and this creates problems with regards to the insurance of the individual. Moreover, with the data collected with the consent of the individual for another research, it is possible to obtain information regarding other illnesses that the individual did not want to be informed about. Another ethical dillema is created about this issue. In this talk, a summary of these issues will be presented and different ethical problems that will arise as a result of these technologies will be discussed in the light of case studies.

## Artificial Intelligence and the Subject of the Law

*Yağmur Denizhan*

Part of the problems that can emerge from advancing Artificial Intelligence technologies can be considered in the same category as the problems caused by any kind of novelty, i.e. loss of order and sufferings during the transition period until a new equilibrium is attained.

In order to narrow down the scope and concentrate on technological novelties, let us consider the impacts of earlier technological advancements from the invention of the steam engine to the adoption of automation. Among these impacts, the sufferings due to human jobs being taken over by the machines would be probably the first that comes to one's mind. But from a more conceptual perspective we can identify the problem as one of increasing complexity. Each new technology that becomes part of our lives typically complexifies the overall system by introducing new interaction mechanisms between different realms (individuals' behaviour and psychology, economy, social structure, environment, law etc.). While providing control over a wider range of phenomena, it also harbours the risk of creating more problems than it solves by destabilising structures, which previously seemed unchangeable. These problems, in turn, invite even further technologies and further complexification. From this perspective, the impacts of technological progress, in the most general sense, can be considered under the general title of "increase of complexity". As complexity increases unanticipated dimensions come into play, old models lose their applicability and prediction becomes progressively harder.

If not constrained by an external control and decision mechanism, increase of complexity is a self-promoting process. The remedy is either to impose normative constraints right from the beginning or to try to compensate for the emerging problems by inventing "patches" on the flight. Nevertheless, the current economic regime is not suitable for putting a leash on "progress". Hence, typically the second option is adopted, and each new patch is justified by referring to favourable arguments such as security, health, human rights, or human dignity. Automation, for example, was promoted by the motive "to let the machines perform the jobs that are either impossible for humans anyway, or unhealthy, physically too demanding, or adverse to human development, in order to liberate the humans for more dignified and mentally improving activities."

If we define AI as "a machine automatically implementing some of humans' cognitive faculties" we can identify it as a special kind of automation, and expect it to be in a similar

position with regards to the problems of complexification mentioned above. However, given AI's special status, it is worth considering its diverse aspects:

On one hand, AI can obviously be human's most reliable support in face of the need for control emerging from systems that become progressively more complex. But this is already a problem, because it justifies systems that are usually too huge and too complex for humans to cope with. Furthermore, in this context –rather than the routine mechanical tasks of old-fashioned automation, which are subject to simple rules - AI is expected to carry out a task that human beings try to accomplish by mobilising all their higher mental faculties, creativity and capacity for subjective judgement. This is exactly where we encounter the most fundamental judicial problem with regards to AI: how can we grant to an AI application the prerogative of taking decisions without leaning on any validated and generally approved rule or criterion on a subject matter that can affect people, other living beings and the common environment? The most fundamental precondition expected from a human or group of humans who will be given the same prerogative is ***legal liability***. Is this notion, which can be defined as "the ability to grasp the meaning and consequences of one's actions", applicable to AI? If no, it should be legally impermissible to deploy an AI application in a decision-making position unless it is under the surveillance and "tutelage" of a liable person.

On the other hand, if yes, what would it mean to acknowledge the legal liability of an AI application? Who or what would be legally liable: the machine, the algorithm running on it, the database used in its training, the scientist who has programmed the machine such that it can learn from databases...?

These questions naturally invite us to reconsider the meaning and basis of legal liability as applied to humans. Which human faculty is it that justifies his/her status as legally liable and "reliable unless proven otherwise": the ability of analytic thinking, mental agility, logic, memory capacity, knowledge, ability to learn, or consciousness?

Rather than relying on such flexibly defined notions that are used in different senses in different contexts, let us describe the knowledge and faculties of a human being as a multi-level dynamic structure and try to introduce some definitions: at the fundament of this living edifice lie the very strictly preserved organic/embodied structures and mechanisms that have proven their viability in a span of millions of years during the course of evolution; at the next level reside life practices that have been developed as solutions to the interaction with the environment in a span of thousands of years of social evolution; higher levels harbour forms of thinking and

apprehension that have been evolving along centuries (and still do); and finally a level where abstractions are situated that allow the conscious expression of comprehension drawn from decades-long individual experiences, observations and findings. Let us call this structure "the edifice of knowledge". For this edifice to maintain its integrity while during its sustained development, a functionality is needed that administers the coherence and coordination of different pieces of knowledge of diverse flexibility at various levels. We can call this functionality "mindfulness" in the sense of being awake, sober and. This integrating functionality, as long as it is active, allows search by trial-and-error at higher levels under the safeguarding of tested knowledge at lower levels. As such, mindfulness constitutes a safety harness, which anchors the human to the solid fundaments of the edifice of knowledge during the journey of open-ended learning, and a basis for his/her legal liability.

Thus, it is not possible to apply the notion legal liability to AI, as it lacks the basis of the edifice of knowledge. Turing's famous paper "*Computing Machinery and Intelligence*" from 1950 can be said to have laid the conceptual fundaments of AI. Its first section titled "The *Imitation Game*" establishes the functionality of AI as an artificial version of the human ability to imitate other persons. Ever since AI has made very significant progress; from "imitating a learned behaviour" it has advanced to the stage of "imitating the learning mechanisms". Nevertheless, its nature that is based on imitation still persists. For something to be imitable, it has to have completed its becoming, must be settled, and have attained a stable form. Therefore, what AI can achieve in an efficient manner and without posing huge risks is limited to the imitation of the well-established lower-level mental functions of the human, which can be repeated under specific conditions.

Aside from the potential risks of assigning great responsibilities to AI, it is worth raising concern about a rather acute legal problem created by AI applications that perform seemingly much smaller-scale unpretentious tasks. The wide-spread usage of AI applications in daily life offers humans the possibility to conduct much more activities in parallel by delegating the administration and control of these tasks, each of which would otherwise require full attendance and conscious vigilance, to smart devices. In other words, AI renders multi-tasking possible for human beings by releasing them from the obligation of mindfulness. Considering the fact that nowadays most people spend a large fraction of their lives in a state of suspended mindfulness, where they conduct many parallel activities and dwell in many contexts without ever being fully present in any of them, we encounter a situation where the "liable subject" assumed by the law is progressively losing her fitness. The statistics about accidents met by people

preoccupied with their smartphones and my observations about the blatant decrease in the attention span of my students make me realise that the threat is not imaginary. If no measures are taken to protect the liability of human, the assumed subject of the law, we will soon find ourselves looking forward to AI's occupying the virtually vacant position of the decision-maker.

## BIOGRAPHIES

### Scott Vrecko

Scott is a sociologist whose research explores the political and cultural dynamics of medicine, health and illness, particularly as these relate to processes of medicalisation and social control. Much of this work uses the case of addiction to examine entanglements of knowledge, power, and subjectivity that arise in relation to contemporary neuroscience and mental health. Strongly committed to interdisciplinary dialogue and collaboration, Scott helped establish the Neuroscience and Society Network (funded by the European Science Foundation from 2006 to 2012), which brought together scientists and social scientists from around the world interested in the social dimensions of neuroscience. He has also guest edited two interdisciplinary journal collections: a special issue of BioSocieties on sociocultural and biological perspectives on addiction, and a special issue of History of the Human Sciences entitled 'Neuroscience, Power, and Culture.'

**Gül Kızılca Yürür**

Kızılca Yürür studied history and sociology in Boğaziçi University, and wrote her MA thesis on the social experiencing of sickle cell anemia in Hatay. She obtained her PhD degree from İstanbul University Medical Faculty on history of medicine and medical ethics. After an extensive field work in Dersim, she published several articles related to various aspects of the healing tradition of Dersim Alevis, and currently finished an introductory book into this healing tradition, which vividly illustrates the dynamic relationship between tribal communities, cities and states flourishing along the pilgrimage and trade routes of Asia. She now plans to extend her research towards the healing tradition of Sivas and Erzincan Alevis.

**Ertan Yurdakoş**

Prof. Ertan Yurdakoş completed his secondary school and high school education at Kadıköy Anatolian High School in 1975 and graduated from Istanbul University Medical Faculty in 1981. In 1986, he started his PhD studies at Department of Physiology at Istanbul University Cerrahpaşa Faculty of Medicine. He conducted his postdoctoral research at Saint George's Medical Faculty in London between 1989-1991.

He became an associate professor in the Department of Physiology at Cerrahpaşa Medical Faculty of Istanbul University in 1993 and a professor at the same department in 1998. He is currently working at Altınbaş University Faculty of Medicine, Department of Physiology.

His research interests are neurophysiology and physiology of behaviour.

**Öget Öktem Tanör**

Öget Öktem Tanör graduated from Istanbul University Faculty of Law in 1959. She worked as an assistant in Constitutional Law Chair in Istanbul University Faculty of Law between 1960 and 1968. During that time in 1963, she went to Columbia Law School for graduate study. Because of her interest in medicine and psychology, in 1966 she applied to PhD program of psychology in Istanbul University, she got accepted providing to meet the certain requirements. Then, she became an assistant in Department of Psychology at the same university between the years of 1969 – 1972. For two years (between 1972-74), she resided in Geneva, Switzerland. When she came back to Turkey, she got accepted to Istanbul University Faculty of Medicine as a doctorate student. The faculty offered this program to psychology graduates with the conditions of taking medicine courses. In 1981, she got her PhD in medicine from Istanbul University. In 1983, she founded the Neuropsychology Laboratory in Istanbul University Faculty of Medicine, Department of Neurology, which is the first Clinical Neuropsychology Laboratory in Turkey. She has been working in this laboratory since 1983. In 1993, she obtained her Associate Professorship, and in 2000 she obtained her Professorship. She taught undergraduate and graduate courses at Istanbul University (Department of Neurology in Faculty of Medicine; Department of Psychology in Faculty of Education), undergraduate courses at Mimar Sinan Fine Arts University, and in psychology departments of other various universities. She has three published books, 18 chapters in published books, various articles in national and international journals. She is a member of Turkish Psychological Association. She is also one of the founders of Neuropsychology Association in Turkey, and is the chair of the executive board of the association since its foundation, which is 2008.

**Tade Matthias Spranger**

Professor Tade Matthias Spranger was born in 1971; First Juridical State Examination, University of Bonn (Germany), 1995; Legal Traineeship, inter alia, for the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and for the Federal Office for Military Administration, 1996-98; Dr. iur., University of Bonn, 1997; Second Juridical State Examination, 1998; Research Fellow, 1999-2000; Associate Professor, Institute for Public Law, University of Bonn, Feb. 2000-Oct. 2004 and Aug. 2005-Jul. 2006; Dr. rer. pol., University of the Federal Armed Forces, Munich (Germany), 2002; Visiting Professor, University of São Paulo, 2003; Member of the Ethics Committee, School of Medicine, University of Bonn, 2003-present; Visiting Professor at the University of Technology Sydney, 2004-2005; Editor-in-Chief, Journal of International Biotechnology Law, 2004-2008; Head of the BMBF Research Group "Norm-Setting in the Modern Life Sciences", 2006-2015; Member of the UNESCO Group of Experts,, A database of legislation, guidelines and regulations in connection to ethics" (GEObs), 2007; Habilitation and venia legendi for Public Law, European Law, International Economic Law, and Biotechnology Law, 2008; Extraordinary Professor, University of Bonn, 2009-present; Member of the Working Group on Ethical, Legal and Sociological Issues, Stem Cell Network North Rhine Westphalia, 2009-present; Member of the DFG Permanent Senate Commission on Genetic Research, 2010-2017; Member of the Ethics Advisory Board of the Human Brain Project, 2014-present; Lawyer at RITTERSHAUS law firm, 2016-present; Member of the Editorial Board, International Chemical Regulatory and Law Review, 2018. More than 350 publications on Administrative and Constitutional Law, International High Tech/Biomedical/Biotechnology Law, Intellectual Property Law.

**Markus Quirin**

**Markus Quirin**'s research focusses on phenomena centrally discussed in existentialism such as mortality awareness, unconscious anxiety, love, freedom, and meaning. He also explores their brain correlates and has advanced the development of a corresponding scientific field, Existential Neuroscience. Markus Quirin received his PhD in Psychology from Osnabrueck University, Germany. After holding fellowships at Stanford University (2016) and Vrije Universiteit Amsterdam (2017), he is now at University of Salzburg, Austria. Dr. Quirin has (co-)authored more than 60 international scientific book chapters and high-impact journal articles. He was the first to investigate mortality awareness using magnetic resonance imaging. He has also published the first standardized measure for the assessment of implicit affect (IPANAT), which is published in more than 10 different languages. Not least, Dr. Quirin is one of the first to have investigated neural correlates of emotion regulation abilities. Markus Quirin's empirical research grounds in an integrated dynamic neurosystems approach towards the human psyche and personality, which has been applied to explain phenomena such as mortality threat coping, decision-making, and free will.

**Hayal Yavuz Güzel**

After graduating from Istanbul University, Department of Philosophy in 1997, Hayal Yavuz Güzel was admitted to the Master's programme in Social Psychology at Hacettepe University, Department of Psychology in 2003. She graduated from this programme in 2007 and commenced the PhD programme in Social Psychology at the same department. She obtained her PhD degree in 2012. In 2013, she joined Hacettepe University Department of Psychology and is giving undergraduate and graduate courses as well as acting as the secondary supervisor for an MA student. Her primary research interests include uncertainty, ostracism and need to belong.

**Müjde Koca-Atabey**

Müjde Koca-Atabey is an assistant professor at the Department of Psychology, Istinye University, Istanbul. She got her PhD degree from Middle East Technical University. Previously she was holding a visiting scholar position at the Syracuse University, Center on Human Policy, Law and Disability Studies. She also had a postdoctoral position at the University of Leeds, Centre for Disability Studies. Her main research interests are terror management theory, disability experience, social model of disability and politics.

**Müjde Peker**

Müjde Peker completed her BA in 2003, and MA in 2005 from Boğaziçi University. She then went to the UK on a Leverhulme Trust Scholarship completing her Ph.D. degree at the University of Kent in 2010. She worked as a post-doctoral researcher at Kent before returning to Istanbul. She worked as an Assistant Professor at Işık University from 2011 to 2015, then joined MEF University in 2015 to help found and chair the new Department of Psychology. Dr Peker conducts lab-based experimental research on intergroup relations, political psychology, and existential psychology. She has published research on ingroup projection, social memory, self-society moral discrepancies and ideology-related processing biases.

**Ejder Akgün Yıldırım**

Prof. Yıldırım graduated from Istanbul University Cerrahpaşa Faculty of Medicine (English) in 1997. The same year, he started his training as an assistant in the second Neurosis Unit of Bakırköy Psychiatric Hospital and acquired his specialty in Psychiatry in March 2002. He was appointed to the same unit as the chief assistant on June 2002. He completed his doctorate in Physiology in Istanbul University Cerrahpaşa Faculty of Medicine between the years of 1999 and 2004. After the Marmara earthquake incident in 1999, he worked as a director in TTB Halıdere Healthcare Center. Throughout the period of death fasts of prisoners, he was assigned as an observer in prisons between 2000 and 2001. He was accepted as a sex therapist trainer in Sexual Education Treatment and Research Association (i.e. CETAD) in 2005. He is the founder and coordinator of the first communal psychology center in Turkey. After completing psychodrama training in Uberlingen-Abdürkadir Özbek Psychodrama Institute between 1997 and 2004, he acquired his psychodrama specialisation in 2006. He also acquired psychodrama training specialisation in 2009. He acquired his associate professorship degree in psychiatry in 2012. He is a member of several associations such as Turkish Psychological Association, Turkish Neuropsychiatric Society and Sexual Education Treatment and Research Association and worked in committees and academic groups of these associations.

He is a psychiatrist who has certificate of proficiency in psychosexual therapy from European Federation of Sexology and also is a trainer of Dynamic Supportive Therapies in Turkish Psychological Association. He is a member of Abdülkadir Özbek Psychodrama Institute Trainers Board committee, Ethics Committee and the head of the Committee of Trauma. He has 2000 hours group therapy directing experience and since 2002, he has been giving trainings about psychological trauma, anxiety disorders, individual and group therapies. He also continues his academic career in which he specifically focuses on social psychology, neuroscience, evolutionary neurobiology, sociometry and group dynamics. He has been working as a clinic chief in the Bakırköy Psychiatric Hospital Neurosis Unit and he also works as a visiting lecturer at Bilgi Üniversitesi Trauma Programme and the chairman of the board in CETAD.

**Ozan Erözden**

Ozan Erözden holds a PhD in public law from the University of Istanbul (1996). Before joining MEF University Law Faculty he held permanent lecturer positions at Istanbul University Law Faculty and at Yıldız Technical University, Department of Political Science and International Relations. Between 1998 and 2001 he worked as human rights observer within the OSCE mission to Croatia. Between March 2006 and September 2007 he conducted research at the International Criminal Law Institute of Cologne University as an Alexander von Humboldt fellow. He participated in two different international scientific projects, namely Blue-Bird (funded by UNDP and coordinated by Central European University) and JURISTAS (funded by European Commission under the 6$^{th}$ Framework Programme), as well as a national one (TÜBİTAK 1001). Erözden's published works relate mainly to theory of state, theories of nationalism, human rights, transitional justice and philosophy of law.

**Güçlü Akyürek**

After having finished elementary school in Istanbul and Galatasaray High School, I graduated from Galatasaray University Faculty of Law. I studied as an Erasmus Exchange Student at Paris Panthéon-Sorbonne University for one semester. Then I took master degree in criminal law at the same University with the Eiffel Scholarship of French government. In 2011 I completed my PhD. on law with my thesis "Offence of violation to privacy". I worked as a research assistant at Galatasaray University Faculty of Law Department of Criminal and Criminal Procedure Law between 2005 and 2014. In 2016 I became an associate professor on criminal and criminal procedure law with my thesis "Retrial". Since 2014 I have been working as a lecturer at MEF University. Furthermore, I am a member of Administrative Board of the Turkish Penal Law Association and Ethics Committee of Faculty of Dentistry, Istanbul University.

**Yeşim Işıl Ülman**

Professor Yeşim Işıl Ülman is a faculty member of medicine and ethics at Acıbadem University School of Medicine, Istanbul. The focus of her studies are the social history of modernization and professionalism in medicine; history of medical institutions and professionalism; issues of bioethics, social determinants of health, ethical aspects of emerging technologies; research and publication ethics, vulnerable groups, animal experiments, health law.

She has worked as the general secretary of the International Congress on History of Medicine in 2002. She has also worked as the assistant editor of the *The New History of Medicine Studies* journal between 1997 and 2006. She was the editor of the book "*Salih Zeki Bey Hayatı ve Eserleri*" (2001). She was one of the writers of Médecins et Ingénieurs Ottomans (IFEA 2003); *Perilous Modernity in the Ottoman Empire* (Isis, 2010) as an IFEA (French Institute of Anatolian Studies) researcher.

Ülman was the chair of Turkish Bioethics Association (2007-2012); and published three books: *Expanding Medical Ethics to Bioethics, Bioethics Studies, Bioethics in a Changing World*. She was in charge of EACME (The European Association of Centres of Medical Ethics) membership of the association and held the association's congress in Istanbul in 2011. She is the founder of Cambridge Bioethics Education Working Group of Turkey. She has been holding the chair position of the Bioethics Master's Program since 2013. Ülman has numerous publications in Turkish and in English.

**Çağlar Ersoy**

Çağlar Ersoy has graduated from Ankara University, Faculty of Law. He worked at the social media industry for a while. He is also the author of the book "*Robots, Artificial Intelligence and Law"* and also continues his work on the area of Online Reputation Management and Personal Data.

**Yağmur Denizhan**

Yagmur Denizhan, who has been graduated from the Electrical and Electronics Engineering Department of Bogazici University, is a full-time faculty member of the same department since 1988. Dr. Denizhan has started her scientific work in the fields of pattern recognition and robotics. Later her research focused on modelling of nonlinear dynamic systems, chaos control and modelling of biological systems. Her fields of theoretical and philosophical interest include cognitive science, biosemiotics, and socio-psychological impacts of technology.