

# Neuro-Legal Sciences from a Neocontemporary and Futuristic Perspective

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**Abstract:** This article is conducted according to a documentary theoretical investigation under a proposal that claims to have foundations of realistic orthodox scientific rigor because it is not a science fiction novel rather it is a realistic framework of what happens in the neo-contemporary progress to axioms Futurists that can be seen as retro-futuristic phenomena in terms of the applicability of the sciences of "complexity" as they call it today for the progress of neuro-legal sciences at an international and national level in any entity. This in order to see the scope before a critical point in the face of its infinitesimal axioms that collaborative fields of high scientific specialty can provide, of which are the experimental cognitive theoretical neurophysics in auxiliary support to the evolutionary and biophysically inspired computational cognitive neurosciences. Its primary scope is to recapitulate the greatest advances from a current perspective of the developments that the scientific community wants to achieve to support said theoretical application fields from which this documentary contribution can be based and a theoretical proposal of how these advances can reach their point evolution critic to his ultimate axiom of development.

**Keywords:** Neurojuridics, Neurotechnology, Neurosciences, Neurolaw, Future, Evolution

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## 1. Introduction

Neuroscience and neurotechnology have advanced rapidly that have increased the possibility of accessing, collecting, disseminating and controlling or editing data from the human brain. These events reflect important human rights problems that need to be studied and addressed in order to avoid unintended consequences. This research work assesses the implications of different uses of neurotechnologies for human rights and suggests that the current human rights framework may not be sufficient to respond to these emerging challenges. After analyzing the relationship between neuroscience and human rights, we identify four new rights that may be of great relevance in the coming decades: the right to cognitive freedom, the right to mental privacy, the right to mental integrity and the right to psychological continuity.

A hypothesis that has been very well received is the one that contemplates the eventual probative use of certain neuroscientific techniques. Understand neuroscience as the science that deals with studying the functional organization of the central nervous system, that is, the brain. This system

is also composed of the spinal cord and peripheral nerves. The cerebrum is made up of the stem, the brain, and the cerebral hemispheres. Likewise, from the cerebral cortex, which is essential for voluntary actions such as language, speech and other higher functions such as thinking and memory. Leaving aside these technical terms, for the moment, it is important to note that the scientific community agrees that:

There is still a lot to discover and learn, fundamentally in aspects as important as consciousness; Therefore, the study of the cerebral cortex and the functions in which it is involved is one of the most active and exciting fields of research within Neuroscience. [1].

According to Sanguinetti, neuroscience deals with studying phenomena such as perception, intelligence, language, emotions, consciousness, the self, decisions, moral preferences, aesthetics, and education.

For the purposes of this work we are interested in situating ourselves in relation to cognitive neuroscience, which according to Casafont is responsible for studying the biological mechanisms that occur in our mental processes and their behavioral manifestations. In this regard, it is also

noted that the three configurative fields of our experiences are thought, feeling and behavior.

This novel science, which is still in development and in the stage of scientific structuring, denies or contradicts many theses of philosophy, psychology and legal science, especially in the field of criminal law. In the words of Michele Taruffo, the problem that we could find refers to the "determination of its effective relevance for the declaration of the facts that are the object of evidence and decision in the trial". González Lagier for his part, considers that there are three challenges that the reduction of regulations to a kind of laws of nature.

Professor González Lagier states that the spectacular development that research on the functioning of the brain -neuroscience- is having has important repercussions for the ascription of moral and legal responsibility. On the one hand, these investigations pose the problem of whether our actions meet the requirements that the classical theory of responsibility demands: freedom of action (that our actions are consequences of the combination of our desires with the beliefs about how to satisfy them) and freedom of will (that these desires and beliefs are in turn, at least to some degree, free and controllable by the agent). On the other hand, they seem to offer new techniques for the proof of the facts or some of them, which generate this responsibility (techniques that we could generically call "neuro-tests").

## 2. Background

Legal tasks have been analyzed from the field of neuroscience and from this a world of possibilities has been obtained. An example of this is what refers to the autonomy of the will, pillar and basic legal principle: the studies carried out by a group of neuroscientists point to the non-existence of free will, whose basis is that autonomy of the will. If this were so, the way of thinking about criminal and civil law would be reformed. Likewise, topics such as capacity, the area of truth and falsehood are developed. The results of this debate could be related to the idea of veracity of witness statements. In this sense, there has even been talk of neurophilosophy and neuroethics. The year 2004 marked an important starting point for the link between neuroscience and law with the appearance of the text *Neuroscience and the Law Brain, Mind, and the Scales of Justice*, a book that perhaps gave rise to an approximation of what could be *neurolaw* at common law. This is the right moment to highlight how the Anglo-Saxon legal system has advantages over civil law, which is still skeptical about the subject, perhaps for fear of exploring a little explored level.

To understand the interaction between both sciences, it will be understood that the brain and the central nervous system in general originate and condition human behavior, which is the object of study for law and, in turn, is regulated by legal systems. Before the development of this science, it was unthinkable, for example, to question the idea of free will from a scientific and non-philosophical perspective, an issue that is now widely discussed and has even been reconsidered and

debated by some jurists the well-established theories of free will. criminal law. Making a parenthesis that has a lot and little to do with it, there are legal scholars who speak of the end of the notion of responsibility, because the non-existence of the so-called "will" has been demonstrated. Thus, this would be the end or at least the beginning of a restructuring of criminal law, including law in general [2]. Such are the postulates of the so-called neurophilosophers as well as neurodeterminists.

For that reason, these and future neuroscience discoveries should modify or nurture the legal institutions that are preserved today, more by tradition than by fully developed scientific foundations. These discoveries could also contribute with neuroscientific contributions to the elucidation of judicial processes, specifically with the possible use of neuroscientific techniques as means of proof within the jurisdiction, a situation that would make it possible to provide better evidentiary tools to the judges, in order to be able to reach a better degree of probability in the confirmation or denial of the propositions made by the parties.

There are several fields in which the law needs neuroscience; for example, in crucial issues such as the determination of capacity, imputability, the impartiality of the judge, the will, legal responsibility, the veracity of a witness or the determination of whether there was an error as a vice of consent. None of this could be treated so deeply by the law without a neuroscientific explanation, which explores how these aspects work in the brain and, therefore, in behavior. All this, we repeat, implies a transformation of the legal culture.

In an effort to interconnect these sciences, the Institute of Neurosciences and Law (iNeDe) was founded. This has a channeling and consensual vision between jurists and neuroscientists, since they analyze the way and the scope in which studies on the functioning of the nervous system can be used in the legal system, validly and effectively.

At this point in the investigation, it becomes more difficult to deny the link and degree of interaction that exists between neuroscience and law, since this discussion is interdisciplinary and transcends borders. This is how the debate is raised and cannot be ignored by the international legal community.

## 3. The Technology of the Brain and the Law

Neuroscience and law intersect on many levels and on several different issues. This is not surprising. While neuroscience studies the brain processes that underlie human behavior, legal systems deal par excellence with the regulation of human behavior. Therefore, it is reasonable to affirm that both disciplines are destined to be "natural allies" [3]. The idea underlying the new field called "*neurolaw*" (*neurolaw*).

It is precisely that a better understanding of the brain will lead to better law design and fairer legal procedures. Numerous examples are known about applications that are potential from the legal perspective of neurotechnology. In this case we can mention brain imaging techniques, which can help in contributing to decision-making in criminal

proceedings that are based on evidence, as well as in investigation and criminal responsibility, punishment, rehabilitation of offenders and assessment of recidivism. The instruments offered by neuroscience could generally play an important role in civil law proceedings, for example in assessing an individual's ability to enter into a contract or the severity of pain in claims for damages.

It is expected that new and reliable technologies will emerge that allow to evaluate the reliability of the word of the witnesses, the elimination of traumatic memories (for being very violent) in the victim as sexual abuse, s another possibility that opens our new understanding of the brain [3]. Aharoni et al., studied the use of a new neurotechnology, which the researchers took a sample of 96 male prisoners after their release: Using FMRI, to scan the brain of each expressionist and, evaluate decision making in performing computational tasks; in addition, they should inhibit impulsive reactions. This same procedure was applied to the ex-convicts for four years, evaluating the same characteristics and scenarios, these authors studied the ex-convicts for 4 years to see their behavior. As results obtained that individual who showed a low activity in the brain region related to decision making and action, the anterior cingulate cortex, have a higher probability of recidivism in crimes during the four years following their release, concluding "a potential neurocognitive biomarker for persistent antisocial behavior". That is, brain scans would theoretically help determine that convicts are at risk of re-offending [4].

The above mentioned, evokes the science fiction story of Philip Dick of 1956: "Te Minority Report", which was adapted to a film in the year 200. It deals with a special police unit, which, by arresting the murderers before they commit the crime, seemed to function successfully until a police officer who belonged to the same unit is mistakenly accused of committing a crime in the future [5]. How accurate is the identification of high-risk criminals?

In this area, the discoverers of lies can be mentioned as a tool to help in the future Why? It is known that these instruments have a margin of reliability today, therefore, it is not possible to take as true or reliable the results obtained. This is why it is necessary to improve and update these instruments so that they can be used as proof of the values of truth with respect to statements concerning memories.

The rise of the fMRI is significant that it was found the existence of two companies in the United States (No Lie MRI and Celphos Corp) that use this method for detecting lies, to understand this we have the study published in 2005 by a group of researchers related to Celphos, where they stated that the use of fMRI as a lie detector has a reliability of 90%; He also predicted that the procedure would be improved to be ready in court. More recent studies have confirmed the results obtained in the use of fMRI as a lie detector. On the other hand, you have the mental decoders, which interpret the mental stages and transform them into observable outputs: tetus, verbal signals or graphic images.

Herff and others and Mirkovic and others [6], demonstrated separately, the effectiveness of a decoder capable of

reconstructing speech through brain waves, therefore, these tools have a potential for clinical application, benefiting several classes of neurological patients, focusing on those suffering from cloistering and paralysis. It is known so far that there are devices that are being tested to monitor brain states to guide the person's behavior. In this case, NASA and Jaguar have been developing a new technology called Mind Sense: which will measure brain waves to evaluate the concentration that the driver has at the time of [2, 5], What is the objective? Determine if the concentration is optimal to continue driving or start driving, otherwise it would trigger an "alarm" mechanism (vibration on the steering wheel or pedals), to raise awareness of the driver who is in danger. This would help reduce the number of car accidents that are caused by stress or distractions. In addition, it would open the doors for brain decoders to be used to spy on people's mental states.

Similar implications arise in relation to brainprint decoders (brain printers). These are prototypical devices currently being tested as brain-based authentication methods. For example, researchers at Binghamton University in upstate New York have devised a way to verify identity based on how the brain responds to certain words. The researchers looked at the brain signals of 45 volunteers as they read a list of 75 acronyms, such as FBI and DVD, and recorded each brain's reaction to each group of letters, focusing on the part of the brain associated with reading and word recognition.. It turns out that the participants' brains reacted differently to each acronym, such that a computer system was able to identify each volunteer with 94% accuracy [4]. This technology, which could soon replace passwords and fingerprints as the authentication tool for personal accounts, raises novel privacy and security concerns.

As mentioned above, neurotechnology is advancing and new opportunities arise for the control and monitoring of cognitive function, however, in matters of law there is uncertainty about how the Law should act in the face of these technological advances. It remains questionable, then, whether or not neurotechnological trends require a thorough overhaul, or at least the replacement of legal concepts at various levels, including civil law, commercial law and legal philosophy".

## 4. Neuroscience and Human Rights

### General Overview

Although neurotechnology has the potential to have a general impact on human rights such as privacy, freedom of thought, integrity, non-discrimination, right to a fair trial, international human rights law has no explicit reference to neuroscience. In comparison to other biomedical developments that have been the objective of normative efforts at the national and international levels., neurotechnology remains largely unknown to international human rights law. However, the implications of neuroscience and neurotechnology regarding inherent characteristics of human beings call for a quick and flexible response from the

law in this area.

The adaptability that human rights norms have shown to respond to the challenges posed by genetics can help anticipate how this branch of law might evolve in the coming years in response to new questions raised by neuroscience. Since the late 1990s, the international community has made significant efforts to address a wide range of issues resulting from increasing access to human genetic data. In 1997, the Universal Declaration on the Human Genome and Human Rights (UDHGHR) was adopted to prevent genetic information from being collected and used in ways that are incompatible with respect for human rights and to protect the human genome from manipulation. Inappropriate actions that can harm future generations. The principles contained in this instrument were later developed in 2003 by the International Declaration on Human Genetic Data (IDHGD), which establishes more specific standards for the collection of human biological samples and genetic data. The interaction between genetics and human rights led to the emergence of new rights, such as the "right not to know one's own genetic information", which is recognized by the UDHGHR and IDHGD, in the same way by other international organizations and national regulations. While there was a need to recognize the new rights, the existing ones had to be adapted to the new challenges that genetics began to pose; reinforced even more with the Universal Declaration on Bioethics and Human Rights of 2005.

This project therefore reaffirms that the neurorevolution will change some of the existing ethical and legal notions. This argument agrees with Notes on how human rights and historical development have emerged in modern societies. the right Real people always appear as a concrete reaction to recurring threats to basic human interests [6], to Human Dignity [7], or 'minimum' Good"[8]. As this paper tries to show, the research Individual control of the neurocognitive dimension itself, as well as on Potential threats to property or essential human interests due to misuse or misuse of equipment Neuroengineering, that may require some recognition Traditional human rights or the creation of new rights Neurotic privacy.

It is beyond the scope of this article to discuss various theories on fundamental human rights or place for them. One for the effectiveness of our study, we chose to adopt a broad concept of human rights practices, as suggested by Beitz, argues that rights are "claims intended to protect interests immediate personal threats against foreseeable dangers ("standard threats") that poor in typical living conditions in the modern world order consists of countries. In general, we can say that the interval of human rights is the guarantee of negative and positive claims minimally essential for a good life [8].

A common objection to the recognition of new rights is that it leads to what is known as "fiscal inflation", which is an unfortunate trend, describing everything that is morally desirable as "human rights". The unjustified increase in other new rights is really the problem because it spreads doubts about all human rights, understanding it as only wishes or purely rhetorical statements. The inflation of rights must be

avoided because it weakens the central idea of rights, which is the protection of a set of human interests.

The generally accepted way to avoid rights inflation is to impose tests to justify new specific human rights. For example, according to Nickel, a proposed human right might be necessary not only to address a very important legal right, but also to respond to a serious and widespread threat to human rights. That the burden imposed on the recipient is justified and not too large; It can be performed in most countries [9]. International law scholar Philip Alston has proposed a list of criteria that the new right is supposed to meet in order to be considered a genuine human right under international law. According to him, the proposed new human rights should "reflect a social value of fundamental importance"; "In accordance with the existing body of international human rights law, but not only with existing rights"; "A very high degree of international consensus can be reached" and "specific enough to give rise to identifiable rights and obligations".

By the criteria described below, it is believed that the new rights protected in this draft, the right to freedom of conscience, the right to mental privacy, the right to mental integrity and the right to psychological procedures, meet these requirements. So there is no risk of contributing to human rights inflation.

This neuroscientific human rights proposal aligns with Glenn Boyer's defense of the "right of mind" of "taking into account the latest knowledge about the brain" and "placing it within the tradition of supporting brains in our country". Design and Limited Government"[10, 11]. As brain technology rapidly reshapes the information layer and digital infrastructure in our society, there is an urgent need to determine whether the legal and ethical frameworks known to date are in optimal condition to deal with any emerging scenery.

It is worth noting here that many of the topics discussed in this paper are not unique to cutting-edge neurotechnology, but have precedent in more traditional interventions. For example, violations of mental privacy arose before the invention of neuroimaging technologies and neuromonitoring technologies, through more rudimentary techniques such as interrogation and polygraph testing. These interventions, however, are not directed directly to neuronal processing, but indirectly through alternative processes such as speech, behavior and physiological signs (such as pulse and skin conduction). In addition, the accuracy and precision of these techniques are very low [12], so it is common that it is insufficient to support justified epistemological inferences about mental data. Similarly, threats to mental integrity and psychological continuity originated from unconscious interventions such as psychostimulants and narcotics long before the invention of interfaces: nervous and brain stimulation. It should be noted that these techniques often have limited effectiveness and reliability in the intentional manipulation of mental activity, as well as a low degree of precision in the selection of neuronal processes. Based on these considerations, we argue that advanced neural technology allows a much higher level of access and manipulation of neural processes than other

technologies [13]. Therefore, although we consider that the ethical and legal analysis analyzed in this paper is applicable to all brain interventions, both calculated and not computerized, It should be noted that the effects of advanced neurotechnology related to the current legal and ethical framework are quantitatively superior to those of non-computational techniques. That's why we put neurotechnology at the center of the proposed regulatory update [14].

## 5. Conclusions

The holy grail of neurolegal science such as neurolaw and forensic neuropsychiatry is not far from being consummated as to the reason for forensic psychopathological behavior since it is a neurogenetic micro-scale dimensional determinism, the ultimate goal of neurolegal sciences lies in being given Appropriate inter and multidisciplinary treatises supported by the representational formula of the exponential progress of exact and formal factual science for a better understanding of the proto-axioms of science.

The recommendation is as follows:

$(A+B)^N+125$ . The equation is punctual since it must be precise in terms of pure scientific realism and not be purely radical as absolutist in proclaiming that the brain is not derived from deterministic processes as many theorists refer to it, without a doubt you just have to keep track of general progress in unified bodies of research from the mother science that nourishes all the sciences of "complexity".

Adan Applicant thesis to be published in the Latin American Association of Legal and Forensic Psychology entitled: neurolegal sciences from a neocontemporary and futuristic perspective) since it should be noted that it was used as a research protocol for the structuring as a publication of this theoretical article documentary film.

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