

Neuro-Legal Sciences from a Neo Contemporary 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: Evolution, Future, Neurojuridics, Neurolaw, Neurotechnology, Neurosciences.

Published Online: November 4, 2022

ISSN: 2796-1176

DOI: 10.24018/ejpolitics.2022.1.5.34

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I. INTRODUCTION

Neuroscience and neurotechnology have advanced rapidly and increased the ability to access, collect, disseminate, and control or edit data from the human brain. This reflects important human rights problems, as there is a need to study and address them in order to avoid unintended consequences. This paper studies the participation of the different uses of neurotechnology for human rights, also emphasizes that the current human rights framework is not sufficient to respond to emerging challenges. After the analysis between the relationship of neuroscience and human rights, four new rights were identified that could take a significant importance in later years (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 (British Neuroscience Association, 2003).

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 Taruffo and Nieva (2010), 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.” Lagier cited in Taruffo and Nieva (2010), for his part considers that there are three challenges that the reduction of regulations to a kind of laws of nature.

This same author 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”).

II. 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 Taruffo and Nieva (2010). 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, immutability, 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 among jurists and neuroscientists, as they analyze the form and scope in which studies on the nervous system can be used in the legal system, valid and effective.

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.

III. THE TECHNOLOGY OF THE BRAIN AND THE LAW

As is known, neuroscience is responsible for understanding the brain processes that derive in human behavior, while legal systems study and treat behavior par excellence, therefore these two disciplines are commonly intersected (Goodenough & Tucker, 2010). That is, both disciplines have the purpose of being “natural allies.” The idea underlying the new field called “neurolaw.”

Therefore, a better understanding of the brain will lead to improved implementation of law and 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. Generally, the evaluation tools that are implemented in neuroscience can play an important role within civil law procedures, for example: in the assessment of the ability of a person to perform a contract or the consequence 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 (Goodenough & Tucker, 2010). Aharoni *et al.* (2013), 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 methodology was applied to ex-convicts for a period of four years, where the same characteristics and scenarios were evaluated. As results, the authors point out that the individual studied showed low activity in the brain region, this related to decision-making and action, Thus, they claim that there is a high possibility that they will re-offend within four years after their release, concluding: “a neurocognitive biomarker for persistent antisocial behavior was found.” That is, brain scanners would theoretically help to determine that convicts are at risk of re-offending (Aharoni *et al.*, 2013).

The above mentioned, evokes the science fiction story of Philip Dick of 1956: “The Minority Report,” which was adapted to a film in the year 2000. 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 (The Minority Report, 1999). 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 & Celphos Corp (Rusconi & Mitchener-Nissen, 2013), that use this method for detecting lies. To understand the above, we have the study published in 2005 by researchers related to Celphos, in which they state that the use of fMRI as a lie detector has a reliability of 90%; Likewise, they mention that this would be ready and improved to be implemented in court. Recent studies have confirmed the use of fMRI as a lie detector.

Herff *et al.* (2015) published the efficacy of an encoder that has the ability to reconstruct speech through brain waves, thus, this would have a potential clinical use, helping several kinds of neurological disorders, especially in those who suffer closure and paralysis. To this day, it is known that there are devices that are in the testing stage, which have the function of monitoring brain states, to have a better understanding of the behavior of the person. Similarly, it is known that NASA is working with new technologies, called Mind Sense: which has the purpose of measuring brain waves to understand and evaluate the concentration of the driver in the time (Taruffo & Nieva, 2010; The Minority Report, 1999), What is the objective? Checking that the driver is in adequate concentration conditions to continue driving, if not adequate, would trigger an alarm (steering wheel vibration and/or pedals), to increase the awareness of the driver who is in danger. This would decrease the number of accidents caused by stress or distractions, in addition, would open the doors for brain decoders to be used to spy on people’s mental states.

This has also been found with the brain print decoders, which are prototypical devices that are in the testing phase as a possible brain-based authentication methodology. To reaffirm the above, a work was found by the University of Binghamton in New York, where it is being devised how to verify identity through the brain’s response to certain words. These researchers studied the cerebral signals of a sample of 45 people while they were reading a list of abbreviations, noting the reaction exerted by the brain to certain letters, focusing specifically on the part of the brain where reading and word recognition are processed. As a result, they found that each brain acts and reacts differently to words, so this was like an identification stamp, and the program had an identification efficiency of 94% (Aharoni *et al.*, 2013). Therefore, this technology would be ideal for replacing passwords and fingerprints as a primary authentication tool for personal accounts.

As described above, neurotechnology will continue to advance and new opportunities for cognitive monitoring and control will emerge, yet in law there remains uncertainty as to whether the law should act on technological advances, it is therefore questionable whether the entire technological trend requires a detailed review.

IV. NEUROSCIENCE AND HUMAN RIGHTS GENERAL OVERVIEW

According to the literature, neurotechnology impacts within human rights such as: privacy, freedom of thought, physical integrity, non-discrimination, fair trial, does not have an explicit reference to neuroscience. Compared to other biomedical advances, neurotechnology remains largely unknown to international human rights standards.

The adaptability that human rights standards have demonstrated in responding to the challenges posed by genetics, this could help prevent how such a right branch could evolve in later ones as an answer to questions currently posed by neuroscience. Since the late 1990s, significant efforts have been made within the international community to integrate the various private issues of increasing access to genetic data. Until 1997, the Universal Declaration on the Human Genome and Human Rights (UDHR) adopted a ban on the inappropriate use of information collected on the human genome. These principles were developed in 2003 by the International Declaration on Human Genetic Data (IDGHD), which establishes specific rules on the collection of human biological samples and genetic information.

The constant interaction between these two disciplines gave rise to new rights, such as the right not to know one's own genetic information, which is stipulated in all international organizations and regulations. Thus, it can be said that it is important to recognize the new rights that have emerged but also to adapt the existing ones to the new challenges that genetics is developing.

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 (Herff *et al.*, 2015), to Human Dignity (Biondi & Skrypchuk, 2017), or 'minimum' Good (Nickel, 1987). 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.

For the effectiveness of this work, a broad concept was selected on human rights practices as suggested by Beatriz: "Rights are claims aimed at protecting interests immediate personal threats against foreseeable dangers ('standard threats') that the poor in typical living conditions in the modern world order consists of countries." In conclusion, it is understood that the range of human rights is the guarantee of negative and positive claims minimally essential for a good life (Nickel, 1987).

A metal in common to the recognition of the emergence of new rights, is the leading to what is known as 'fiscal inflation,' which, is an unfortunate trend because it describes everything that is morally wanted as 'right.' Then, the emergence of new rights can become confused, this is because it could be understood as an unjustified increase in people's needs and that they were not created as a protection of human interests.

It is generally the case that inflation of these duties can be avoided through the imposition of evidence justifying the creation of such duties. For example: according to Nickel (1987), a proposed human right could integrate not only an important legal right, but also as a resolution to a serious and widespread threat to human rights. Therefore, the burden imposed on the benefit would be justified and not too large, but this would be implemented in most countries (Habermas, 2010). According to Alston (cited in Habermas, 2010), considered as an erudite in matters of law, he proposed a series of criteria that the new rights should meet to be considered as a true human right under international law. In their thinking, 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 "sufficiently specific to give rise to identifiable rights and obligations."

According to these criteria, these rights are considered to fulfil these requirements: the right to freedom of conscience, the right to mental privacy, the right to mental integrity and the right to psychological procedures. There is therefore no risk of contributing to human rights inflation.

This neuroscientific human rights proposal aligns with 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" (Human Rights | Internet Encyclopedia of Philosophy, 2002; Nickel, 1999). 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 important to mention that several of the topics covered in this document are exclusively of the avant-garde neurotechnology but have precedents in more traditional interventions. That is, the violation of mental privacy was born before the invention of neuromagen and neurosurveillance technology, through more rudimentary methodologies such as interrogation and polygraph tests. These interventions are not directed directly to the neuro process, but rather indirectly through alternating processes such as speech, behavior, and physiological signs.

Moreover, the accuracy and precision of these techniques are very low (Boires, 2000; Brigham & Kumar, 2010), so it is often insufficient to support justified epistemological inferences on mental data. Similarly, threats to mental integrity and psychological continuity are born through unconscious interventions such as psychostimulants and narcotics, long before interfaces arose nerve and brain stimulation. It should be noted that these techniques often have limited effectiveness and reliability in intentionally manipulating mental activity, as well as a low degree of accuracy in the selection of neural processes. Based on these considerations, it is understood that advanced neuronal technology has allowed an increase in the level of access and manipulation of neural processes than other technologies implemented (Iacono, 2008). In other words, the ethical and legal analysis of this document is applicable to all brain interventions, both calculated and uncoated. It should be noted that the effects of advanced neurotechnology related to the current legal and ethical framework are quantitatively higher than those of computational techniques. That's why we put neurotechnology at the center of the proposed regulatory update.

V. 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.

ACKNOWLEDGEMENTS

I thank in the first instance in an agnostic way according to the rigorous orthodox realistic absolutist science, which through the creative consciousness (God), allows such work to be carried out, as well as the scientific community in general, but like my dear friends and teachers, my dear parents, Dr. Alfredo Adan Pimentel and Mtra. Esperanza Rios Granillo.

REFERENCES

- Aharoni, E., Vincent, G. M., Harenski, C. L., Calhoun, V. D., Sinnott-Armstrong, W., Gazzaniga, M. S. & Kiehl, K. A. (2013). Neuroprediction of future rearrest. *Proceedings of the National Academy of Sciences*, 110(15), 6223–6228. <https://doi.org/10.1073/pnas.1219302110>.
- Biondi, F. & Skrypchuk, L. (2017). *Use Your Brain (and Light) for Innovative Human-Machine Interfaces*. SpringerLink. https://link.springer.com/chapter/10.1007/978-3-319-41956-5_10?error=cookies_not_supported&code=3cdf6d67-b4b5-402b-bf73-ff531821815f.
- Boires, R. (2000). Mind Matters. *Journal of Cognitive Liberties*, 4, 710.
- Brigham, K. & Kumar, B. V. K. V. (2010). Subject identification from electroencephalogram (EEG) signals during imagined speech. 2010 *Fourth IEEE International Conference on Biometrics: Theory, Applications and Systems (BTAS)*. <https://doi.org/10.1109/btas.2010.5634515>.
- British Neuroscience Association Neurosciences. (2003). The Science of the Brain: An Introduction for Young Learners. *Slide share*. <https://es.slideshare.net/alehlizarraga/neugrociencias-15560160>.
- Dick, P. (1999). The Minority Report. 2nd ed. J. Triptre Trad.
- Goodenough, O. R. & Tucker, M. (2010). Law and Cognitive Neuroscience. *Annual Review of Law and Social Science*, 6(1), 61–92. <https://doi.org/10.1146/annurev.lawsocsci.093008.131523>.
- Habermas, J. (2010). THE CONCEPT OF HUMAN DIGNITY AND THE REALISTIC UTOPIA OF HUMAN RIGHTS. *Metaphilosophy*, 41(4), 464–480. <https://doi.org/10.1111/j.1467-9973.2010.01648.x>.
- Herff, C., Heger, D., de Pestere, A., Telaar, D., Brunner, P., Schalk, G. & Schultz, T. (2015). Brain-to-text: decoding spoken phrases from phone representations in the brain. *Frontiers in Neuroscience*, 9. <https://doi.org/10.3389/fnins.2015.00217>.
- Human Rights | *Internet Encyclopedia of Philosophy*. (2002). <https://iep.utm.edu/hum-rts/>
- Iacono, W. G. (2008). Accuracy of polygraph techniques: Problems using confessions to determine ground truth. *Physiology & Behavior*, 95(1-2), 24–26. <https://doi.org/10.1016/j.physbeh.2008.06.001>.

- Nickel, J. (1987). *Making Sense of Human Rights*. Google Books. https://books.google.com.mx/books/about/Making_Sense_of_Human_Rights.html?id=htOh-jXX6sIC.
- Nickel, J. (1999). *Human Rights*. The Stanford Encyclopedia of Philosophy.
- Rusconi, E. & Mitchener-Nissen, T. (2013). Prospects of functional magnetic resonance imaging as lie detector. *Frontiers in Human Neuroscience*, 7. <https://doi.org/10.3389/fnhum.2013.00594>.
- Taruffo, M. & Nieva, J. (2010). *Neuroscience and Judicial Process*. <https://www.marcialpons.es/media/pdf/9788415664901.pdf>.



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