



Neuroética:

una guía multifacética

ABSTRACTS

CHAPTER I

LA PERSONA: BASE FUNDAMENTAL DE LA NEUROÉTICA

Person: The Foundation of Neuroethics

José Damián Carrillo Ruiz, Lorea Sagasti Pazos, Luis García Muñoz, José Castilla Barajas.

Abstract

The concept of person has been debated in various disciplines throughout the history of mankind. However, recent neuroscientific discoveries make it necessary to rethink the problem from a new approach. The multidisciplinary nature of Neuroethics forces us to review the concept from different perspectives. We believe it is, precisely, the integration of the elements provided by philosophy, neurosciences, psychology and law, as we will come to a closer view of the reality of a concept as complex as that of person. In this work we will review some of the visions that in the different areas of thought interpret the human being. In both scopes of neuroethics the person is the starting point, the object of study and end of it. We must consider all areas that integrate it to safeguard human dignity in the use and application of neurosciences. Terms such as brain, mind, conscience, awareness, consciousness, moral have no other support than the concept of person.

CHAPTER 2

INTRODUCCIÓN A LAS NEUROCIENCIAS: ACTIVIDAD NEURONAL BÁSICA

Introduction to Neurosciences: Basic Neural Activity

Luis Carrillo-Reid

Abstract

Despite several decades of neuroscience research, it is still unknown how brain activity allows the internal representation of the external world and how changes in neuronal activity patterns produce devastating pathological conditions such as Parkinson's disease, schizophrenia, Alzheimer's disease, depression, among others. Most of our knowledge

about cerebral functions relies on single neuron recording techniques or changes in oxygen/glucose levels in a given brain region. Such techniques have not been able to develop neuronal manipulation protocols that allow the precise control of neuronal activity. Recently, the development of new techniques that allow the recording of neuronal activity with single cell resolution has provided researchers with the ability to study neuronal activity with an unprecedented level of spatial and temporal precision. The further development of recording and neuronal manipulation techniques will culminate in the understanding of specific neuronal circuits bridging neuronal activity patterns and behavioral states due the description of neuronal motifs. The goal of this chapter is to introduce the general concepts underlying the development of neuroscience research to understand the ethical and experimental challenges for the next generations.

CHAPTER 3

NEUROÉTICA O NEUROBIOÉTICA: ORIGEN, DESARROLLO Y DEFINICIÓN

Neuroethics or Neurobioethics: Origin, Development and Definition

Alberto Carrara

Abstract

Around 1960s, the convergence between (1) the new multi and inter-disciplinary field of neuroscience; (2) the bioethical context, and (3) the philosophical speculation dealing with the nature and the causal power of the mental, gave rise to a new and neglected area of ethical concern called 'neuro-ethics'. In this chapter, the author analyzes the development of neuroethics as an endeavor that promotes a practical, systematic and informed reflection on neuroscience and neuro-technologies applied to human life. Neuroethics deals also with the analysis of different interpretations of the nature and function of the nervous system, in general, and particularly of the brain. Identified at first as a special area of the 'traditional' bioethical reflection, neuroethics is nowadays considered mostly an emergent and interdisciplinary context with an ambition to comprehend the implications of neuroscience and neurotechnologies for human flourishing and self-understanding.

CHAPTER 4

HISTORIA Y PREHISTORIA DE LA NEUROÉTICA EN MÉXICO

History and Prehistory of Neuroethics in Mexico

José Damián Carrillo Ruiz, José Alberto Castilla Barajas, Luis García Muñoz.

Abstract

The history of Neuroethics in Mexico can be divided into two stages, the first was carried out within the framework of neurosciences and the application of them in medical practice.

In this first period, the study was not framed in the field of neuroethics but was the result of the analysis of new technologies in neurosciences. However, the second stage, even more recent, initiated a systematic study of neuroethics aimed at preserving human dignity. Many people have contributed to the development of this subject in Mexico. In the present work, the participation of all the people who have worked to develop neuroethics, is recognized. In the same way it concludes the study of Neuroethics must grow by forming different groups in this area, other professionals must venture into the field. It is necessary the participation of philosophers, lawyers, anthropologists, biomedical, engineers, psychologists, etc. Neuroethics in México will grow if we join efforts among professionals, groups and institutions.

CHAPTER 5

UN SISTEMA DE UBICACIÓN PARA LA NEUROÉTICA, UN CAMPO INTERDISCIPLINARIO

A Localization System for Neuroethics, an Interdisciplinary Field

Maríel Kalkach Aparicio

Abstract

Neuroscience and neurotechnology (neuroS/T) are being developed and applied, and neuroinformation (neuroI) coming from these advances is addressing issues such as the basis of conscience, consciousness, cognition and action; concepts about self-determination and the mind's and being's nature I. This field has emerged and progressed rapidly, with activity that can be reflected in a growth greater than 70% throughout a period of 10 years since 2000 to 2010².

Today, neuroS/T start to be perceived as one enterprise, reciprocal, inextricable and interdependent enterprise, that holds an iterative heuristic process which generates theory through the most updated tools I. This enterprise will later encourage the development and use of more capable and precise tools that will treat, adapt and/or confirm new theories. Furthermore, it will give information and instruments that could be translated into knowledge. Then, this knowledge will be poured into the practical world, starting with the clinical and moving forward towards the paraclinical areas, where society holds human activities and relationships not immune to these developments¹.

The need to guide the use and interpretation of neuroS/T/I, has become an important task, given the delicate work which entails dealing with concepts which are at the core of human personal experience and society's structure. Concepts such as those discussed in neuroscience of ethics, touch the foundation of many ideologies and transcend to the every-day practice of numerous professional endeavors. All the aforementioned, have given birth to neuroethics as a field. As neuroS/T/I grow reaching various domains (legal, education, military, etc.) and through different approaches (theoretical, investigative and practical) their potential profound impact is fundamental in the relevance of neuroethics.

Apart from the expansion of neuroS/T/I's impact in different domains, neuroethics growth is also seen in the amount of disciplines which have become involved in the field. Since the beginning neuroethics has been recognized as an interdisciplinary and prominently fertile field due to the richness of: a. the current collaborations among sciences, such as neurosciences and mathematic sciences, humanities like philosophy, as well as social sciences such as anthropology, and b. the potential additions of other disciplines, including subdisciplines and interdisciplines. However, as with any other interdisciplinary field, richness comes with a difficulty to communicate among disciplines and deciding how much can be integrated or shared in methodological processes.

In the hope of making interdisciplinary communication easier for those entering neuroethics for the first time, as well as for the veterans in the field an alpha-numerical coding system is proposed. This simple system implies briefly stating the neuroethics area(s) in which the work at hand develops or stands. Additionally, some relevant elements for any academic work should be given. These include the used concepts or topics, models or theories, methodology (disciplinary, inter, multi or transdisciplinary), and contextual framework. The purpose of the system is to decrease the frequency of assumptions, unanswered questions or misinterpretations in the published works in neuroethics. This chapter's tasks are a. To draw a map that represents a guide with enough information so that the reader has a visual representation of the areas in which the neuroethics literature lies, and b. To suggest the use of the alphanumeric code or "coordinates" to be used in any published work in neuroethics in order to give others a more accurate location of one's work in the field. This tool or location method is an attempt to improve the problem of communication found in any interdisciplinary field, aiming to be a guide for the author publishing and a concrete primary source to acquire relevant information for the reader consistently. In this book the coding system is used at the beginning of each chapter, which offers a discrete framework to any reader in order to advocate for interdisciplinary encounter in the field.

CHAPTER 6

IDENTIDAD FRENTE AL REDUCCIONISMO NEUROBIOLÓGICO

Identity Standing Before Neurological Reductionism

Ma. Elizabeth de los Ríos Uriarte

Abstract

The philosophical dilemma on our essence which can be basically translated as being just our brain or more than it, has become a real problem when facing challenges such as our personality and how we are modified by the environment surrounding us. Then, questions asked about our emotions and the latent possibility of modifying the way we experience things raise the question, about the ethics that underlying such possibilities.

One discussion has to do with the idea of identity. How it is formed and altered, if it is something unmodifiable or if, perhaps, we can shape it by intervening in certain areas of

our brain. Yet, if so, what will make us human then? This problem brings up the idea of contingency as a constitutive element of our nature.

Another problem has to do with how we behave among others. What defines what we ought to do in certain circumstances, what good is and what bad means. Moreover, if we are determined to do good things or the opposite, what makes us act in that direction? The discussion about free will is what underlies this topic, and, therefore, the problem about what this free will really means.

Finally, concerning the previous, the possibility that science gives to intervene in our brains and enhance certain capacities or provoke determined reactions towards certain circumstances could potentially be something good. Yet I comment that the limits and motivations aren't always clear, for this Ontology and Ethics should be a reference point to return to and think over.

CHAPTER 7

LA CONSCIENCIA: UN MODELO TEÓRICO INTERDISCIPLINARIO CON RELEVANCIA CLÍNICA

Consciousness: An Interdisciplinary Theoretical Model with Clinical Relevance

Maríel Kalkach Aparicio

Abstract

Whether in Scope A or Scope B, consciousness is one core topic in neuroethics. Consciousness has been understood in various ways depending on the area that studies it. While interdisciplinary approach enriches the understanding of the concept, it also promotes complexity since each discipline uses diverse methods and concepts that are difficult to reconcile. It is uncommon for physicians to consider the philosophical concepts which give a better grasp of theoretical difficulties and how such challenges impact the clinical realm. On the other hand, philosophers could benefit from clinical observations, which become the embodiment of their theories. Given the complex nature of the subject, an interdisciplinary method is used to present a big picture of consciousness.

First, the medical concept of consciousness, is laid out and its limitations are highlighted. Then, Integrated Information Theory (IIT), a novel interdisciplinary framework of consciousness, is introduced to complete the picture that cannot be addressed by the medical field alone. Specifically, the concept of knowledge tested in the clinical scenario to proof that a patient is conscious, is placed on the bigger scope of subjective experience, provided by IIT. Secondly, reality matching is brought forth as an implicit but key element in the clinical assessment of consciousness. Thus, it is proposed that it is explicitly acknowledged as part of the clinical assessment of consciousness. This framework may be helpful to gain a different perspective on consciousness in agnosia, anencephaly, epilepsy, and even psychiatric patients.

CHAPTER 8**LA CONCIENCIA*****Consciousness: an interdisciplinary theoretical model with clinical significance***

Mariel Kalkach Aparicio

In Spanish lexicon the terms consciousness (consciencia) and conscience (conciencia) have come to almost merge and have one extended meaning, creating some academic difficulties. This chapter briefly distinguishes both concepts and focuses on conscience from moral, psychological, psychiatric, neurobiological and neuroimaging perspectives, to give an overview of the recent findings and proposals which enrich our knowledge of the concept. Starting from its development in early years of life, some studies and theories on the mechanisms of a young moral compass are reviewed, making an emphasis on the relevance of empathy. Then, based on those premises I tease out questions concerning the foundations upon which current criminal justice systems around the world construct their plans regarding judgments and sanctions for juvenile delinquent behaviors. Since I propose these could be better understood and answered through an interdisciplinary view of moral conscience, a brief review is given on what an early distortion of the moral compass leads to. The most relevant considerations ought to be in pathological scenarios, since antisocial personality disorder or so-called psychopathy is of great concern for legal systems around the world. Despite its association with what appears to be highly functional individuals, at its core, this disease may be more damaging than benefitting for the person and society. However, given the fact that this disorder is either rarely diagnosed or when identified within a criminal context the individual seems to be cognitively aware of his or her actions, the judgment to which they might be subject in the case of a delinquent behavior is often lacking a regard for them as mentally affected, thus making a fair legal processing difficult to achieve. Therefore, understanding the shaping of moral conscience through environment and biology in childhood is important to be able to comprehend the absent emotional knowledge in these persons' judgments and actions, which allows for its consideration in the legal system. On the other hand, the use of biological evidence in U.S. courts as means to diminish a sentence seems to be focusing in the reduction of a person's responsibility while overlooking the direct and relevant indication that it is more likely to be difficult for that person to change their behavior. In addition to this, if biological evidence is used to better understand or assign a person's responsibility in criminal justice, other conditioning elements for his or her development of antisocial or aggressive behavior (e.g. childhood abuse) could or should be used for the same purpose, since they are also beyond the person's responsibility to choose.

CHAPTER 9**LIBRE ALBEDRÍO Y NEUROCIENCIAS*****Free-will and Neurosciences***

José Carlos Abellán Salort y Alberto García Gómez

Abstract

Currently, neuroscience advancement cannot explain the complexity of voluntary human act without admitting the possibility of free-will. Although there have been proposals which affirm the opposite, we explore some evidence and facts upon which the first premise is built. Law, faithful to its telos which legitimizes its role in society, namely, to contribute to justice and common good, should foster the development of neurosciences promoting the advance in knowledge, but at the same time the protection of some juridical fundamental goods. The understanding and safeguarding of identity, integrity, privacy and inviolability of human beings lies at the core of major neuroethics discussions in the legal domain.

CHAPTER 10**NEUROTEOLOGÍA: LA FILOSOFÍA COMO PUENTE ENTRE LAS NEUROCIENCIAS, LA RELIGIÓN Y LA TEOLOGÍA*****Neurotheology: Philosophy as a Bridge Between Neurosciences, Religion and Theology***

Peter Mullan

Abstract

Neuroscience seeks understanding of all aspects of brain activity in human knowing and behavior; one such area is religious experience. Neurotheology inquires both, it studies the brain activity of during such experience, as well as interacts with theology and philosophy to understand its findings. Neuroethics here plays the role of interfacing or mediating on a philosophical level between the two branches of knowing involved, science and theology. In what follows I will mention some of the recent neuroscientific findings in neurotheology and present a personal view informed by the Catholic religious tradition. The utility of these findings for theology and science, and some areas in which philosophy and science would have to work in order to establish a productive dialogue, precede a conclusion where relevant questions are teased out from this reflection.

CHAPTER 11

NEUROTEOLOGÍA: ASPECTOS COGNITIVOS DE LAS CREENCIAS Y EXPERIENCIAS RELIGIOSAS Y ESPIRITUALES

Neurotheology: Cognitive Aspects of Religious and Spiritual Beliefs and Experiences

Diego Alberto Manjarrez Garduño

Abstract

Religious beliefs involve institutional aspects around the idea of supernatural beings within traditional religious communities. On the other hand, spiritual beliefs are individual with respect to the transcendent or sacred and are based on personal experience rather than the traditions of a cultural or social system. However, both require cognitive processes and specific neural networks for their generation, such as semantic and emotional memory, self, spatial processing, theory of mind, decision making and executive functions. The inquiries related to how the brain constructs the idea of God and arguments about the divine, further allow to study the influence of neurobiological and cognitive mechanisms in religious and spiritual beliefs, and how these affect our states of consciousness, feelings and behavior. At the same time, spiritual and religious beliefs, influence moral decision-making and are involved in emission of ethical judgments. In what follows an overview of the neuropsychology and then cognitive aspects of spiritual and religious beliefs, will be discussed. The brain areas that have been related to religious and spiritual experiences, are mentioned as well as the encounter of these in epilepsy.

CHAPTER 12

NEUROESTÉTICA Y ÉTICA

Neuroaesthetics and Ethics

Juan Manuel Salgado Camacho

Abstract

Neuroaesthetics, is a recently created discipline that aims to be a bridge of communication and discussion between neurosciences and art. The neurobiology of art is an extraordinarily interesting line of research to make contributions that allows us to initially issue theories related to the genesis of artistic activity. Nothing is defined with respect to the creative impulse of an artist. The knowledge that currently exists is novel and intensely encouraging. The neurosciences are currently trying to give the neurobiological correlates of aesthetic appreciation, the creative impulse, the emotion linked to art, and even the connection between artistic creation and disease or even cure. The reflection of all these revolves around Neuroaesthetics as a new transdisciplinary paradigm. Advances in neuroradiology, specifically Functional Magnetic Resonance Imaging (fMRI), have expanded the exploration of neurobiology in the last two decades, facilitating discussions without precedent such as those between artists and neuroscientists.

CHAPTER 13**DILEMAS MORALES EN LA NEUROCIRUGÍA:
SESGOS Y SOLUCIONES*****Moral Dilemmas in Neurosurgery: Biases and Solutions***

Manuel Hernández Salazar, Jesús Tomás Moncada Habib, Mariel Kalkach Aparicio

Abstract

Neurosurgery has an important role in neuroethics, as the single medical branch that performs procedures on the brain. Many neurological cases involve moral dilemmas, most of them would have a difficult treatment and recovery, also loss of function or the end of life is often a strong possibility. The clinical thinking of a neurosurgeon consists not only in the facts of illness, there is always an emotional content of patients, family and its own. The personal and impersonal dilemmas are both present at neurosurgeon's practice, it is important to create a system in which neurosurgeons could make choices for the good of patients taking care of them as well. Moral dilemmas should be discussed and analyzed following a standardized methodology, these structured techniques would improve the medical decisions and think about many possibilities and results. Neurosurgery is moving to the future, modern and better technology are taking us to ambitious procedures that could benefit many people, neuroethics should be an important ally for solving difficult clinical cases and avoiding bad use of these tools.

CHAPTER 14**BIOÉTICA PARA LOS AVANCES TECNOLÓGICOS EN LAS
NEUROCIENCIAS TRASLACIONALES*****Bioethics for the Technological Advances in Translational Neurosciences***

Rodrigo Ramos-Zúñiga

Abstract

Bioethics from the perspective of innovation, raises different challenges and dilemmas that be seen and solved promptly if one considers the thematic knowledge and disciplinary area. Such is the case of Neuroethics, which could be more accurate while dealing with ethical dilemmas in neuroscience than perhaps general bioethics. Ethics in neuroscience, in this book "Scope B", involves the analysis of technological development and its biomedical applications from a translational perspective. This conceptualization considers that biomedical research products can be applied in the short term in the resolution of specific problems of a community, bridging the gap in which many prototypes and inventions are lost over the course of time. In addition to this, while global demand of Translational Science increases, considerations about the technological industry's involvement, which has a key role in providing technology, should be kept in mind. This, with the purpose of maintaining the health of individuals and society at the center, guarded by the clinician's reflection

using the fundamental principles of bioethics and neuroethics guidelines. This chapter offers a perspective for the place of technology in the clinical scenario as the source of clinical advancement, but also a source of conflicts, which then turn into ethical dilemmas. Some recommendations to ensure the adequacy for treatment are provided for clinicians pursuing the use of novel approaches, techniques or technologies in clinical neurosciences.

CHAPTER 15

ÉTICA EN LA ESTIMULACIÓN CEREBRAL PROFUNDA EN UN CONTEXTO DEL SISTEMA DE SALUD

Ethics in Brain Deep Stimulation in a Healthcare System Context

Fiacro Jiménez Ponce

Abstract

Deep Brain Stimulation (DBS) is a relatively novel neurosurgical treatment conducted to modulate the neuronal activity in order to decrease the intensity and the frequency of neurological or psychiatric symptoms. Therefore, DBS ameliorates the suffering condition of the patients. DBS is carried out through a sophisticated medical device and technique in which two electrodes are implanted inside very specific neuroanatomical structures. Mechanism of action of DBS is based on the release of electric impulse around neuronal bodies or axons. The electric energy from a battery is conducted by two independent extensions connected to the implanted electrodes. The device is fully implanted under subcutaneous tissue. DBS is accepted as treatment in several illnesses which include Parkinson's Disease, dystonia, refractory Epilepsy, neuropathic pain, Major Depression Disorder and Obsessive-Compulsive Disorder. Other emergent diseases are considered for "compassionate use" or to be used in research clinical trials (Tourette syndrome, drug abuse, eating disorders or aggressive behavior).

This chapter focuses on four ethical issues relative to DBS in neurological and psychiatric disorders: the relationship among the industry-institution-health personnel; the scientific evidence of benefits of DBS; The accessibility or facility to obtain this therapy; The potential ability to produce mental or emotional changes in the patients. Usually, local and international government agencies and independent ethical committees have regulated the relationship between the enterprises and the institution-personal for health. However, some influence from devices-makers could be directed to increase the number of neuromodulation systems implanted. On the other side, the high price of devices has led to assess the real benefits of DBS. The economic burden of most implanted devices has been taken up by the governments or directly by the patients. Approximately 150 thousand devices have been implanted around the world. The cost of each device in Mexico is between 20 to 30 thousand dollars. If every patient who is a candidate for DBS in Mexico was implanted, the amount of inversion would be from 3000 to 4500 USD.

Current scientific evidence of DBS utility is level I, II or III based in reports of auto-controlled clinical trials; randomized double-blind clinical trials and a few systematic reviews with

meta-analysis. Medicine Based on Evidence recommend DBS as treatment Level A, C or D depending on the indication. In 2013, an expert consensus elaborated "The Proceedings of the third annual deep brain stimulation think tank: A review of emerging issues and technologies." In this document DBS guides for treatment were established.

As in many other issues related to biotechnology, the accessibility to DBS depends on the existence of distributive justice rather than medical indication. Finally, despite the adequacy of DBS treatment, and due to the possible changes or "enhancements" of several neuro-physiological abilities as side effects, a neuroethical analysis must be conducted. Currently in Mexico, as the rest of Latin America and most of the world with access to these technologies, the view "to treat, no to enhance" is prevalent in the official neuromodulation clinical centers.

CHAPTER 16

IMPLICACIONES JURÍDICAS DE LOS AVANCES NEUROTECNOLÓGICOS

Legal Implications in Neurotechnological Advances

Alberto García Gómez, José Carlos Abellán Salort

Abstract

Law, faithful to its telos which legitimizes its role in society, namely, to contribute to justice and common good, should foster the development of neurosciences promoting the advance in knowledge, but at the same time ensuring the protection of some juridical fundamental goods. The understanding and safeguarding of identity, integrity, privacy and inviolability of human beings lies at the core of major neuroethics discussions in the legal domain. Based on the previously built (see Ch. 9) premise of the irreducibility of human beings to their material nature, in this chapter we continue to examine some neuroscientific and neurotechnological advances and their use in the area of Law, while at the same time reflect in some relevant ethical considerations.

CHAPTER 17

NEUROLEY DESDE EL DERECHO: NEUROCIENCIAS APLICADAS AL DERECHO PENAL EN MÉXICO

Neurolaw from a Legal Perspective: Neurosciences Applied to Criminal Law in Mexico

Nicéforo Guerrero Espinosa

Abstract

Man has struggled with his scientific inventiveness to improve his life; doctors have always put talent at man's service. Today there are more opportunities to preserve the quality of life, but we must remember that the more resources we have, the broader the individual and collective responsibility is. This is the case for neuroscience and neurotechnology

growth, and the implications it may have in the practical domain. Perhaps it is required for lawyers to study topics of neuroscience and neurotechnology applied to the law.

The people are those who give life to Law, the man creates the legal reality, and, in turn, it is the legal norm that determines who possesses the legal personality, to act in front of it. The person exists in a social relationship as a member of the community and for solidarity towards my neighbor. On the other hand, neurosciences study the behavioral foundations of our individuality. The complexity of the mind shows us new ways to understand behavior through neuroimages obtained by the non-invasive method of fMRI functional Magnetic Resonance Imaging. There are scientific advances that can modify the perception of law.

The Neurosciences are being studied in several areas, and now the jurist is obliged to be educated about the advances of neurotechnologies such as brain imaging and the way these are already used in courts worldwide. It is worth noting that these advances in neuroscience are already intervening in the decisions of the study of the judicial process. By becoming more accurate every day, they could provide new tools for judges to find the truth of the facts, hence promoting resolutions to be better founded by irrefutable, or at least more valid, scientific data.

Some legal systems have already embraced the use of neurosciences or neuroinformation. Such is the case Roper vs Simmons where the Supreme Court of the United States abolished the death penalty, arguing the unconstitutionality of capital punishment for crimes committed by minors of under 18 years old. It was considered and demonstrated that the lack of maturation in the brain lobes and the little expansion of neural networks, did not allow to treat adolescents in the same way as adults in full consciousness.

Another approach within the scope of neurolaw is the practical goal of giving support to people who have suffered neurological damage when they must deal with courts, or legal proceedings, precisely in the condition of suffering in which they are. Remembering that human dignity is the value that should be kept in the center of one's practice.

The truth is that science is advancing rapidly, while legal science is relegated to the legislative processes that take their time and requirements for the creation of legal rules. A new phase opens up in the study of prosecution with which all jurists, inevitably, we will have to face.

Understanding the organic brain configuration of a person which could have influenced him or her, to commit or not a crime or to act in a certain way, has enormous advantages, but also risks that are equally relevant. Given these data I can conclude that there is still much to investigate in Neurolaw, human behavior is unpredictable, but the brain images could constitute hints about it. Hopefully, in a short time lawyers will be able to use these new scientific discoveries in court arguments. Hence, the legal framework for Mexican law is given, followed by a short case analysis to illustrate our view on the use of neuroscience and neurotechnology responsibly in Law.

CHAPTER 18**DILEMAS ÉTICOS ACTUALES EN PSIQUIATRÍA*****Current Ethical Dilemmas in Psychiatry***

Enrique Chávez León

Abstract

Ethics in psychiatry is the application of moral rules to the field and practice of mental health. In the history of humanity there has been abuse towards vulnerable populations with diseases, especially mental illnesses. The World Psychiatric Association is one of the main institutions which protects the rights of patients with psychiatric illnesses and has established standards for treatment in the search of a good and dignified mental health care. Four universal medical principles are used to guide actions all throughout the patient's management: autonomy, beneficence, non-maleficence and justice. The diagnostic criterion for mental disorders is established by gathering every relevant evidence such as genetic markers, family, temperament, environmental, brain substrates, and clinical course. Treatment in psychiatry should always be focused on the patient, considering their capacity for decision and voluntariness. Accordingly, when appropriate, informed consent is one of the tools through which the patient shows that he or she understands the diagnosis and treatment proposed and expresses his or her free-will by agreeing. This document is grounded in three very important and essential aspects: information, decision-making capacity and voluntariness. As an example of psychiatric common scenarios and the application of ethical concepts in them, suicide, electroconvulsive therapy and confidentiality are reviewed.

CHAPTER 19**ÉTICA EN LA PSICOLOGÍA: DILEMAS QUE SE ESCLARECEN EN LA REFLEXIÓN FILOSÓFICA*****Ethics in Psychology: Dilemmas Solved through Philosophical Reflection***

María Teresa Araiza Hoyos

Abstract

Every profession has an intrinsic purpose, which is often expressed in its ethical codes. In relation to Psychology, this chapter refers mainly to the Ethical Code of the American Psychological Association (APA) and that of the Mexican Society of Psychology. Ethical Codes are useful for solving ethical and bioethical dilemmas that emerge in the practice of Psychology; these codes need to be constantly reviewed, since the real-life situations psychologists face, change with times and are increasingly complex. However, even when an ethical code may be well prepared, it is not enough to guide a professional's behavior in all circumstances. In the cases in which he or she doubts about the correct course of action in a certain ethical dilemma, the best next option will be to reach out to ethics committees,

the opinion of knowledgeable mentors and colleagues, common sense and, above all, one's conscience. When faced with ethical dilemmas, psychologists must use their intuition, however they should be able to articulate adequately the reasoning behind their decisions. Such reasoning, and the reflection which precedes it, should include respect for human dignity and ensure the welfare of clients and patients within a professional framework that takes into consideration the technical and theoretical relevant matters for each case.

In order to understand ethics principles and codes in psychology more profoundly, I suggest that formal ethics and philosophy should be part of Psychology curricula. Approaching ethics and philosophy through psychology during their professional education, would also allow them to engage in philosophical debates. In this sense, this could bring them into the discussion of neuroethics within neuroscience of ethics (Scope A).

CHAPTER 20

NEUROMERCADOTECNIA Y ÉTICA: PROMESAS Y AMENAZAS

Neuromarketing and Ethics: Promises and Threats

Luis Gabriel Méndez Mondragón

Abstract

In recent years, Neuromarketing has increased its use and visibility in the marketing practices of companies around the world. This has represented a change of paradigm in the way that consumers are understood, and in the strategies developed to reach and influence them. This is possible given the advancements in our knowledge of the human brain and our thought processes. These learnings have permeated to several fields of human experience, and marketing is not an exception, where neuro-techniques are applied with the objective of optimizing communication efforts such as ads, logos, messages and packaging, among others.

Along with these new possibilities, new scenarios arise: the value of the neuromarketing techniques resides in the information that they are able to provide and that comes not from the conscious aspects of the consumer, but from its emotional and non-conscious aspects, that is, information that is not necessarily available to themselves but is available to the researchers through neuro-techniques. This opens doors that seem as promising as threatening: Can neuro-tools really improve dramatically the effects of the brands commercial efforts? If so, isn't an ethical border crossed, given that companies can pull levers in the customers' mind that they don't know exist, and can ultimately modify his or her attitudes and behavior.

To answer these questions, we must first understand the nature of the outputs that the neuro-techniques provide. It is key to not lose sight that these tools provide measurements of physical brain activity (blood irrigation levels, neuronal electric level) which then is interpreted and correlated to mental states, which are really the outcomes under which the consumer's response is analyzed. Considering this, we can then ask: Have commercial performance indicators improved when neuromarketing is involved? Is this a general output, that is, does neuromarketing effects improve the performance and status of brands across categories and countries?

The results, seen through years of experience of using neuro-techniques across the world, are mixed, by which we mean that some brands, campaigns and ads that have used them have improved their relevant metrics (awareness, consideration, and ultimately, sales), while others have decreased in those measures. A reasonable explanation for this is that neuromarketing's reach can only go so far. Certainly, the inputs that the area can provide are potentially useful but are only part of the multiple factors that play a part in a brands' situation.

Neuromarketing can help a brand to achieve its objectives, but it can hardly make it by itself. The counterpart of this situation is that, at its present state, it doesn't represent a threat for the consumer in terms of modifying its behavior in a manner much different than marketing has traditionally achieved. To draw any ethical consideration, which must be done, one first needs to acknowledge what neuromarketing can do and what it doesn't do, which is often over- or underestimated.

CHAPTER 21

TRANSHUMANISMO Y NEUROPOTENCIAMIENTO DESDE LA BIOÉTICA PERSONALISTA

Transhumanism and Neuroenhancement from Personalist Bioethics

Thelma Peón Hernández

Abstract

Transhumanism is not science fiction anymore. It's neither something waiting to happen in the near future. Transhumanism is a reality that impacts, in subtle and amazing ways, the life of any men and women. It's part of human's everyday life. From personalism's bioethics, transhumanism violates human's dignity because its objectives turn men and women into a means instead of an end. Transhumanist philosophers propose the next evolutionary step for mankind through rationality, thus neuroenhancement relevant for this movement. An analysis confronting personalism and transhumanism is made in the following paper.

CHAPTER 22

DOLOR Y SUFRIMIENTO: TRASCENDER ANTE EL TRANSHUMANISMO EN DOS MANIFESTACIONES PREVALENTES EN LA PRÁCTICA CLÍNICA

Pain and Suffering: To Transcend before Transhumanism in Two Prevalent Manifestations in Clinical Practice

José Damián Carrillo Ruíz, José Castilla Barajas, Lorea Sagasti Pazos, Luis García Muñoz.

Abstract

Pain and suffering are present in people's lives from their beginning. Humanity has tried by various means to eliminate them from life. However, as an alternative, through differ-

ent disciplines scholars have tried to give them meaning and explain their existence. In the present work we present a multidisciplinary approach to define pain and suffering. We highlight the discussion surrounding the distinctions and the close relationship between pain and suffering. Through this discussion a defense is drawn to show the value of their existence in human life as an inherent part of man's nature, which can give meaning to his existence through learning. Likewise, the need to discuss the current tendency to eliminate suffering and its possible negative consequences is left on the table. Lastly we mention that the role of neuroethics is not only concerning the ethical adequacy for certain pain treatments or other clinical matters, but it also in the relations pain and suffering hold with other core topics such as consciousness.

CHAPTER 23

DILEMAS BIOÉTICOS EN LA PRÁCTICA DE LA NEURORREHABILITACIÓN

Bioethic Dilemmas in Neurorehabilitation Practice

Antonia Cervantes Barrios, Martha Margarita Tarasco Michel

Abstract

Chronical diseases will require rehabilitation when degeneration occurs. One of the new techniques in physical rehabilitation and in other medical specialties is neurorehabilitation, with scientifically proved benefits. Even though it is not used universally. Its use requires a well-trained interdisciplinary team, and the periodic and recurrent application of non-invasive scientifically validated instruments such as imaging studies and transcranial stimulation. Expenses from the use of these in addition to medications for chronic illnesses, results undoubtedly in elevated costs. This affects the economy of public medicine and the patient's own means, adding to the problem of limited material resources allocation, and the fair distribution of health care. Health care systems have always given a low budget for rehabilitation in general. Hence, an ethical problem of justice should be addressed: How can we distribute the costs and benefits of new technology, without disregarding the responsibility and merits of each person?

This paper begins with a general and short description on neurorehabilitation, describing different invasive techniques, such as thalamotomy. In such cases the proportionality of the intervention must be considered. This principle states that good actions with disproportionate bad effects should not be performed. Also, the principle of justice should be posed, as it refers to the fact that allocation of resources should be distributed regarding the need and merit of each person. One should look for the maximum good in every action, considering both principles at hand next to each other. Although, taking this into practice at the health care system level in Mexico, where there is a minimal access to this very highly specialized type of rehabilitation will be hard to attain. In addition to the challenging economic factors, the lack of hospitals in Mexico in which one can be trained in neurorehabilitation (only

two), also accounts for the little number of available specialists. In the personalist view of bioethics, the principles of solidarity and subsidiarity are interwoven with justice. They propose to distribute goods as each person needs it, but when receiving it, one becomes co-responsible of the good received. Lastly, the paper will explain the principle of therapeutic proportionality, which would be another form of considering the precaution principle.

CHAPTER 24

EXPERIENCIAS CERCANAS A LA MUERTE: REPORTES, TEORÍAS Y RELEVANCIA PARA LOS PROFESIONALES

Near Death Experiences: Reports, Theories and their Relevance for Professionals

María Teresa Araiza Hoyos

Abstract

Near Death Experiences (NDEs) are mainly reported by individuals who were supposedly dead (no heartbeat, no breathing and flattened brain waves in an electroencephalogram), and then returned to life. After the period of unconsciousness they narrate perceptions such as Out of Body Experiences (OBEs), seeing a tunnel and a bright light, meeting dead relatives or feeling unconditional love; they are able to describe what was happening while they were unconscious and they present positive changes after the experience, including a decreasing fear of death, more altruism and empathy, less materialism, greater acceptance of individual differences, a sense of oneness with others and the feeling that love is the most important thing. The experience is described in a very similar way by subjects all over the world, regardless of their religion, culture or background. The explanation to this phenomenon has not been found. If it is true that a person who reports NDEs is dead when he or she is experiencing them, then it stands to reason to assume that personal consciousness is independent from the brain. On the other hand, if personal consciousness depends totally on the brain function, then the individual was not dead when he or she was experiencing the NDEs. Neither one nor the other theories have given indisputable evidence, but they contribute to the neuroethical discussion about the origin of consciousness and its implications to science and metaphysics, as well as to the controversies surrounding the definition of death and the importance of all this to organ transplants.

CHAPTER 25

MUERTE ENCEFÁLICA (CEREBRAL): ¿MUERTE DE LA PERSONA?

Encephalic (Brain) Death: ¿Person's death?

Yael Zonenszain Laiter

Abstract

Medical advances, especially those related to organ transplantation, have led to a new definition of death: brain death is now equal to human death. This purports some ethical problems that

have not been wholly studied within the realms of bioethics and neuroethics. One such ongoing dilemma with still no definite answer, is the question of whether brain death represents a valid criterion to define the death of a person, given the changes observed throughout history in the concepts of "personhood" and "death". The purpose of this chapter is to provide a view that analyzes and demonstrates that the concept of brain death is not a defining criterion of human death, but a prognostic one, in which only the rights owed to the patient are altered, even though his or her status as a person does not change by his or her condition.

CHAPTER 26

NEUROBIOÉTICA Y LA INCIDENCIA DE LAS NEUROTECNOLOGÍAS EN LOS DERECHOS HUMANOS Y JUSTICIA

Neurobioethics and the Impact of Neurotechnologies in Human Rights and Justice

Alberto García Gómez, Chiara Ariano

Abstract

Nowadays, current advancement of neuroscience cannot explain complexity of the voluntary human act, without admitting the possibility of free will. Therefore, Law desiring to keep faithful to its telos that legitimize its role in society, namely to contribute to justice and common good, should foster development of neurosciences in respect of juridical fundamental goods that we mention in this essay: identity, integrity, privacy and inviolability of human beings, whose body is not a merely physical-biological support and accordingly he or she are entitled to and endowed with moral and legal goods that inherit his or her personal nature.

CHAPTER 27

ASPECTOS ÉTICOS EN LA INVESTIGACIÓN NEUROCIENTÍFICA CON SUJETOS HUMANOS

Ethical Aspects in Neuroscientific Research Involving Human Subjects

Manuel Velázquez de León Calvillo

Abstract

Any researcher engaging in neuroscience research with humans should be aware of the different ethical aspects that must be considered to prevent exposing the subjects to unnecessary physical and/or psychological risks. Fortunately, international codes provide guidelines to address ethical considerations related to the different stages of any biomedical research. However, these documents have not been developed to recognize risks and provide guidance on ethical considerations specifically within a neuroscience research

context. Although practically all ethical aspects in the international codes of biomedical research also apply to neuroscience research with human subjects, some unique issues, regarded as neuroethical considerations, could emerge in this context. These issues might require special attention and a deeper understanding of neuroscientific concepts and awareness of the current limits of scientific pursue, given the paramount changes that can be caused to the human subject when manipulating the mind or the brain. The following chapter serves as an introductory guide which draws from the international ethics codes and focuses on how to identify and address general ethical issues specifically in neuroscience research with human subjects.