

neuroethics



magazine

ISSUE 01

What is “neuroethics”?

A digital publication from the Public Communication and Publishing
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Letter from the editors

Why a Neuroethics Magazine? To answer this question, let's divide it into two more simple and straightforward questions. First, Why neuroethics? And second, why a magazine?

Why neuroethics?

Neuroethics lies at the intersection of neuroscience and ethics, exploring the many ethical, societal, cultural, and legal implications of advances in neuroscience and neurotechnology. It explores questions of consciousness, identity, privacy, autonomy, and justice, among others. As our understanding of the brain grows, and technologies such as brain-computer interfaces and brain-modifying drugs become increasingly sophisticated, the need for thoughtful reflection on the ethical dimensions of these developments becomes ever more pressing.

Why a magazine?

Social media thrives on delivering a vast amount of information in a short span of time. However, when it comes to complex topics like ethics, it's critical to engage critical thinking and reasoning. Social media platforms are not great spaces for deep reflection; they encourage fast consumption and instant reactions. Instead, a magazine offers a platform for presenting concise, well-researched information that encourages readers to pause, contemplate, and form their own informed opinions.

We believe that discussions about neuroethics should extend beyond the confines of academic institutions and reach a broader audience, YOU. Neuroethics affects us all, shaping the future of medicine, technology, law, and society. It is a field that demands participation and engagement from diverse voices, not just experts in neuroscience and ethics. It needs YOU.

So, we invite you to join us in exploring neuroethics through our magazine. Our goal is to make neuroethics accessible and comprehensible to everyone, fostering dialogue, understanding, and collaboration. Let's embark on this journey together, where diverse perspectives are valued, and thoughtful discourse is celebrated.

If you've been reading this and thinking to yourself 'But what is neuroethics after all?', don't worry – we knew you'd ask that. So keep reading – for our first issue is specifically dedicated to answering this question.

Enjoy your read,
Katherine Bassil and Erin Morrow



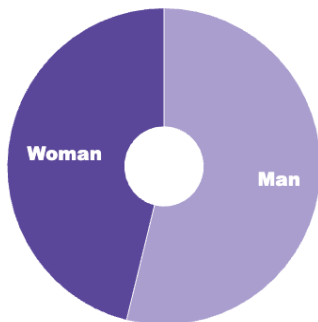
Who performs **neuroethics**-related work? (26 respondents)



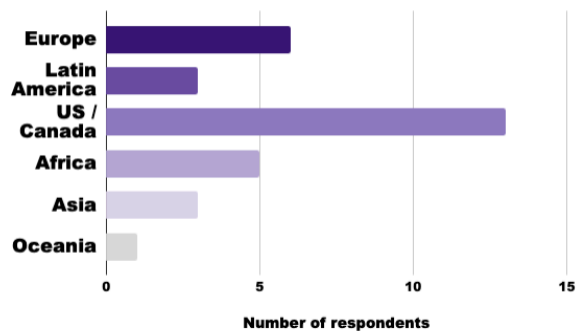
With what fields do you think **neuroethics** intersects? (26 respondents)



Demographics



What region (or regions) do you live in or identify with?



Is this the “New Neuroethics” era?

by **Francisco Rosero-Villarreal**
MD, PhD Bioethics (c), MSc, MSc, Esp

It has been over two decades since the term "neuroethics" was first introduced in the Conference Proceedings "Neuroethics: Mapping the Field" in San Francisco, California. Since then, the fields of neuroscience and neurotechnology have undergone rapid development, presenting increasingly complex ethical dilemmas. What was once considered "science fiction", is now a reality.

***These pivotal
advancements push
us to engage in
discussion for a "New
Neuroethics."***

Several ethical frameworks have been proposed, one of which arose from fears surrounding genomic research. Over time, researchers have turned to the "Responsible Research and Innovation" (RRI) methodology and considerations of Ethical, Legal, and Social Issues (ELSI) as guiding principles. Critics of RRI have highlighted concerns regarding vague terminology and inadequate practical incentives for adopting RRI principles.

Some groups have embraced a Human Rights framework, yet this approach also presents limitations, particularly in navigating discussions entangled with legal regulations on neurotechnology. While government oversight and regulation are important, they should not hinder the progress of neurotechnology, and ethics should serve as the foundation for any legal discourse. However, it is evident that

this model may not adequately address the complexities of present and future neurotechnological research.

These fast-paced neurotechnological developments invite us to move away from frameworks that were established over 75 years ago. While human rights considerations remain vital, they may prove insufficient in addressing the multifaceted applications of neurotechnologies across various sectors.

Interdisciplinary dialogue involving international agencies, academia, and neurotechnological developers is crucial to navigate the diverse landscape of neurotechnology applications, spanning entertainment, work & employment, wellbeing, marketing education, health and medicine, industry, military use, and beyond, and to advance research in this "New Neuroethics" within a globalized context.

Emphasis should be placed on translational neuroethics, bridging the gap between academic findings and real-world applications. Moreover, active involvement of the general public in decision-making processes is essential to ensure ethical considerations are aligned with societal needs.

Whether we like it or not, political realities are embedded in decision-making processes surrounding neurotechnology. Political influences may skew discussions toward particular interests, potentially resulting in unethical outcomes. We do not have to be naive about this possibility and as neuro-ethicists we have an obligation for political activism to protect what makes us humans, our brains.

In essence, these paragraphs serve as a call-to-action, urging global stakeholders to collaboratively advance the fields of neuroethics and neurotechnology. Through interagency cooperation and the establishment of comprehensive guidelines with more general public participation we can forge a much needed new framework for this evolving "New Neuroethics."

Francisco Rosero-Villarreal
MD, PhD Bioethics (c), MSc, MSc, Esp



Fig. 1.

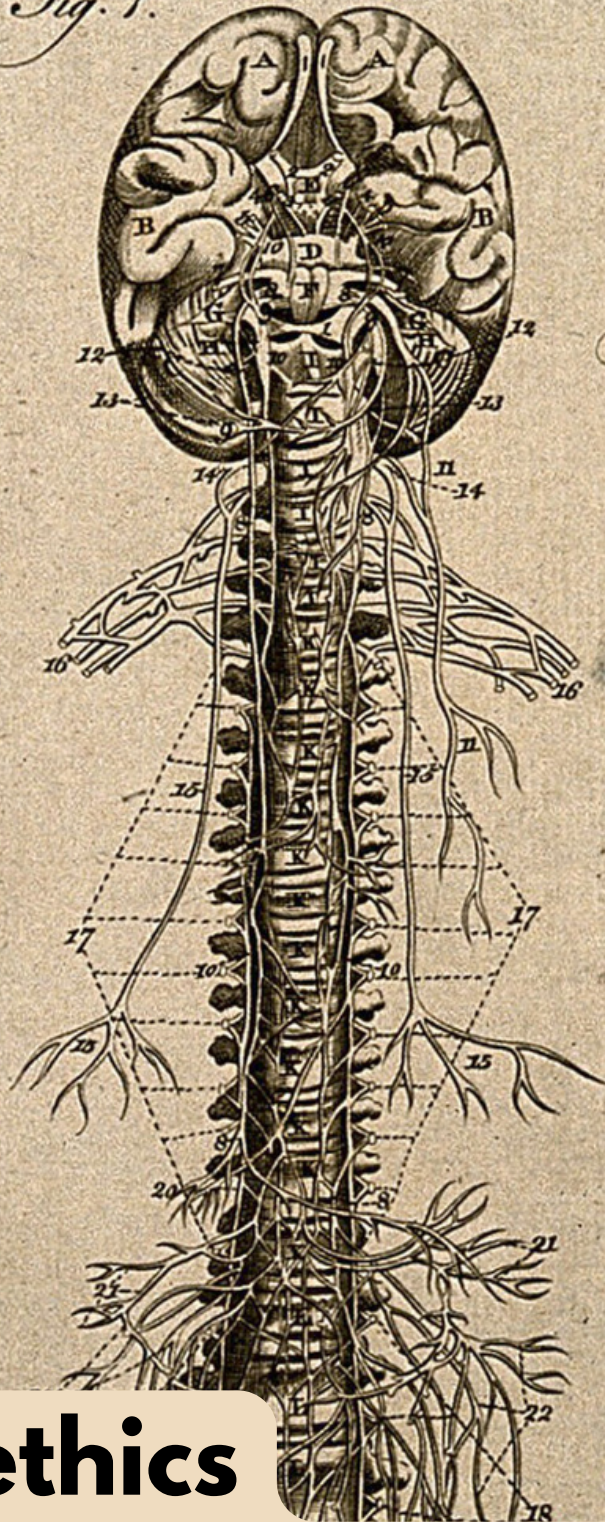


Fig. 2.

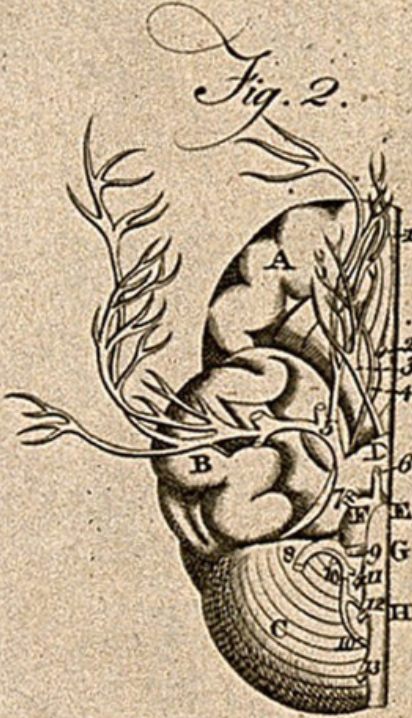


Fig. 3.



Fig. 4.

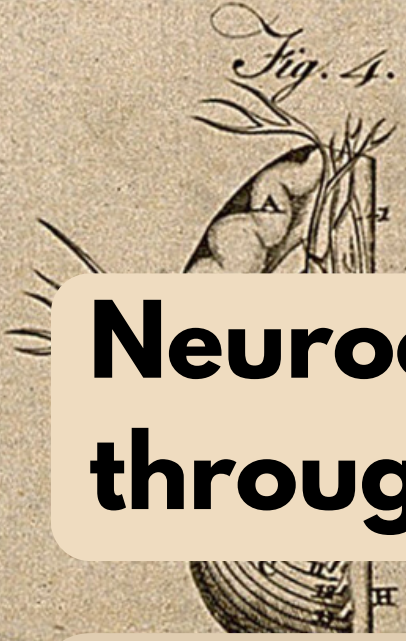


Fig. 5.



**Neuroethics
throughout the years:**

A TIMELINE

23 → ← 23

Type of timeline item



Practice



Insight



Event(s)

Field of study*



Bioethics



Medicine



Neuroscience



Psychology



Neuroethics

*These classifications do not endorse the item's scientific validity or moral value.

Initial concerns about science and society

Europe (Greece)
Plato speaks of the potential dangers of an 'enhanced' class of humans in *The Republic*.



375 BCE

Rising popularity of phrenology

Global
European physicians attempt to classify humans into racial categories depending on the shape of their skulls. This practice spreads globally.



1810 - 1840

Mental asylums

Europe and North America
People with mental illness are confined to 'insane asylums' of religious and moral framing to keep them away from society. This leads to significant stigma that people like Dr. Wilhelm Griesinger eventually combat through asylum reforms.



LATE 1800S-1990S

Emerging ideas about the mind and body

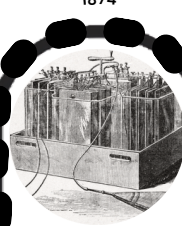
Europe (Greece and Rome)
Galen proposes a continuity between the mind and body—that no sharp distinction exists between the mental and the physical. Descartes disagrees, proposing mind and body dualism—that the mind and body are two distinct substances.



100 AD - 17TH CENTURY

'Unethical' practices in brain medicine

North America
Cases arise, raising concerns about brain safety. For example, Mary Rafferty approaches physician Bartholow with a large hole in her skull caused by cancer. Bartholow experiments with applying current to Rafferty's brain, leading to seizures, convulsions, and eventually death.



1874

Rise in psychosurgery

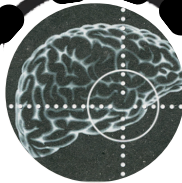
Europe and North America
Frontal lobotomy, the surgical sectioning of the brain's prefrontal cortex, comes into fashion. This is done to treat mental disorders and solve the pressing problem of overcrowding in mental institutions.



1930S - 1950S

Prominent, challenging cases in neurology

North America
Cases continue to challenge how we treat those with neurological conditions. For example, parents refuse surgery to address their child's birth defect because of Down syndrome (Baby Doe case, 1982) and a family is conflicted with the choice to continue life support for a woman in an irreversible vegetative state (*Terri Schiavo case*, 1990).



2002

Controversial studies of psychology

North America
Several studies uncover shocking things about the behavior the mind is capable of producing. The *Milgram shock experiment* (1961) shows that people will administer lethal levels of electric shock to others when they are obeying authority. In the *Stanford prison experiment* (1971), participants instructed to act as 'guards' in a fake prison become violently abusive.



1960S

Wartime brain experimentation

Europe (Germany)
In Nazi-controlled Germany, prisoners are put in a low-pressure chamber to simulate high-altitude conditions. If prisoners survive, vivisections are performed. This involves removing samples from their brains, along with other organs.



1945 - 1946

Start of neuroethics-related meetings

North America
The Dana interdisciplinary meeting in San Francisco (USA), 'Neuroethics: Mapping the Field', founds neuroethics as a new discipline (2002).



1980S - 1990S

Introduction of the word "neuroethics"

North America
Anneliese A. Pontius first uses the word 'neuroethics' when discussing the ethical implications of using devices to help infants learn to walk.



1973

Abuse of children with developmental disabilities

North America
Staten Island (NY, USA) opens *Willowbrook State School*. Many unsanitary and abusive practices are uncovered at this school.



1947

International society focused on neuroethics

Global
The International Neuroethics Society (INS) meets for the first time in Washington, DC (USA) to discuss the development of the neuroethics discipline.



2008



Rise in neuroethics-related writing

Global
The first neuroethics specialty journals are founded: Neuroethics (2008) and American Journal of Bioethics Neuroscience (2010). Moreover, the Presidential Commission for the Study of Bioethical Issues released two Gray Matters including two recommendation articles on neuroethics topics at the request of American President Barack Obama (2014, 2015).

2008 AND 2010



2013 - 2016



Medical advances continue to pose neuroethics concerns

Global
Physicians claim to have performed the first human head transplantation between two brain-dead organ donors (China, 2017). Scientists claim to have restored certain functions in pig brain cells up to 4 hours after presumptive death, sparking ethical questions related to consciousness, animal research, and other issues (USA, 2019).

2017 - PRESENT



Global neuroethics movements

Global
The International Brain Initiative (IBI) is founded by representatives from Japan, Korea, Europe, USA, and Australia. This initiative hopes to speed up progress on "cracking the brain's code." China and Canada later join the initiative.



2017



Legislative responses to neuroethics issues

South and North America
Chile passed Law No. 21.383, which aims to protect mental integrity in the face of emerging neurotechnologies (2021). Colorado (USA) extended privacy protections on sensitive data to include neural data (2024).

2020S - PRESENT




Development of commercial neurotechnology

North America
Ventures into commercial neurotechnology continue to expand, raising neuroethics questions. For example, Elon Musk's company Neuralink claims to have implanted their first neural implant chip into a human.



PRESENT

A long, brightly lit hospital hallway with a polished floor. On the left side, there is a row of yellow chairs with armrests. The walls are white with several doors, some of which have yellow handrails. The ceiling has recessed lighting fixtures. In the distance, a blue cart and a potted plant are visible.

**Exploring neuroethics
around us through**

CASE STUDIES

Neuroethics in the real world: Current cases



Dr. Andrew Huang, a doctor specializing in neurology and palliative (serious illness) care, recently faced two challenging cases. The first case involved a man we'll call Wade*. One day, Wade suffered a sudden cardiac arrest and quickly received CPR. Nonetheless, Wade suffered severe brain damage, and his wife was told that there was a **90% chance that her husband would need 24/7 care** in a nursing facility upon discharge. Wade's wife was ready to let him have a natural death when, unexpectedly, he **"woke up."** Wade went on to fully recover.

The second case involved a man we'll call Gino*, who also experienced cardiac arrest, but did not receive CPR quick enough. Similarly, Gino suffered severe brain damage. He was put on life support for nine months and was said to be in a "minimally conscious" state. Although Gino's wife was told that the likelihood of his recovery was slim, some clinicians gave her false hope. They told her that sometimes the extent of recovery is unknown for many years after the injury. However, when Dr. Huang talked to Gino's wife, he noticed this **false hope was causing her distress**. She expressed that she was "98% sure" that Gino would never want to live like this. Ultimately, after a few discussions, **she decided to allow Gino to pass naturally**. Gino died a few days later in the palliative care unit at the hospital.

In the first case, doctors were too pessimistic about Wade's chances of recovery, almost leading to a decision to let him die before he could improve. In the second case, doctors were too optimistic, nearly going against Gino's assumed wishes to let him live in a state he wouldn't have wanted. Fortunately, discussions between clinicians and families allowed for a change in course. However, Dr. Huang is concerned about this. He says that **life-and-death decisions shouldn't depend on which doctor you happen to see on a given day**.

Dr. Huang stresses the importance of better preparation for both clinicians and families facing such difficult situations. Clinicians need clearer guidelines on how to approach end-of-life discussions. These conversations often lack standardized training across fields like palliative care, rehabilitation, and general medicine. Having open discussions with patients and their families can strongly impact how they navigate these emotionally intense scenarios. On the family side, it's essential for people to talk with their loved ones about their wishes in such situations, should they ever face them. For example, writing these decisions down in "advance directives" can provide invaluable guidance to bioethicists and physicians in clinical settings. In his practice, Dr. Huang helps run support groups for cardiac arrest survivors and has advisory panels to aid individuals in navigating these complex situations.

Together, Wade and Gino's cases underscore the **importance of understanding our beliefs about hope, life, and death**. They reveal that, even though we usually avoid thinking deeply about these existential questions, addressing them and acknowledging our mortality can lead to more informed and compassionate decisions in challenging medical situations.

Eunice Kamaara, an ethics professor, has a friend we'll call Taman*. Taman is in the hospital, diagnosed with chronic heart disease while also struggling with a self-labeled alcohol addiction. Taman explains that his problems come from the home — his wife is assertive and dominant, putting high expectations on him. He says he drinks to numb the exhaustion he feels from these expectations. Despite being advised to quit drinking because of his heart condition, Taman found himself **unable to break his pattern of drinking**. He eventually resorted to cheaper, illegal alcohol after stopping work and losing financial support from his wife.



After hearing Taman explain his behavior, his wife became annoyed, feeling that he was avoiding responsibility for his actions. She argued that it was, in fact, his alcoholism that caused her to become dominant over time — as Taman's drinking led him to become an irresponsible husband and father to her children. The wife was convinced that Taman was the source of his own problem.

This complex situation has left Professor Kamaara wondering how we should consider people's free will and agency. At what point should individuals be held accountable for their health issues, especially when **addiction has harmed their decision-making abilities**? Was Taman's wife aware of the impact of her behavior? Can Taman be held responsible for choosing to drink illegal alcohol, when addiction might have impacted his ability to choose? Is there a systemic failure, such as lax enforcement of laws on illegal alcohol, that should be addressed?

This story is representative of many individuals and their families who face addiction. It can be easy to follow only one perspective and miss the whole story. We blame people for their actions, even when the underlying reasons for them are unclear. Professor Kamaara also notes similar issues, such as students using stimulant drugs to enhance performance on exams.

Learning about substances and behaviors that change how our brain works can help us appreciate the risks involved. It can also help us reflect on how we can harm ourselves or others, how we place blame on others for behavior that we may have contributed to, and where society places the blame. Learning how to support those affected with addiction could **lead to greater empathy, rather than immediate criticism**.

This story shouldn't be misunderstood to mean that humans have no control over their behaviors. The reality is more nuanced. Making decisions about accountability is often difficult, especially in neuroethics, brain biology, and behavior.



Nicole Chiapponne, an Assistant State Attorney in Florida, has recently realized the potential threat that neuroscience poses to the criminal justice system if not managed properly. In one of her most recent cases, the defense hired a neuropsychologist for a juvenile review hearing. We'll call him Dr. Johnson*. In the State of Florida, children and teens under 17 years old convicted of capital (very serious) crimes have the right for their life sentence to be reviewed after 25 years is served. After conducting several clinical interviews, Dr. Johnson **diagnosed the defendant with a specific mental health disorder.**

However, Attorney Chiapponne quickly realized the **diagnosis was based on unreliable methods.** She decided to file a *Daubert motion*, which challenged the admission of Dr. Johnson's diagnosis in the case. In response, Dr. Johnson went back and performed the appropriate tests, changed his opinion, and **withdrew his previous diagnosis.** The hearing is still yet to be heard.

There are many ethical concerns in this case, but perhaps the most significant was that **Dr. Johnson had no specific training in forensic psychology.** From a legal standpoint, Dr. Johnson's original methods did not meet the legal threshold for admission, yet he was prepared to present testimony before a court that could have a major effect on the judge's decision. A misdiagnosis is a great concern for many reasons, including the chance that the patient will not receive the appropriate treatment and will fail to progress through the healthcare system. Here, it also could have had legal consequences.

Attorney Chiapponne believes it is important that expert witnesses, especially in neuroscience, be held accountable and have unreliable methods challenged. This case highlights the importance of the judge's role as a gatekeeper to keep out invalid science. It also serves as critical information for anyone who finds themselves as a juror in a case where neuroscience is mentioned.

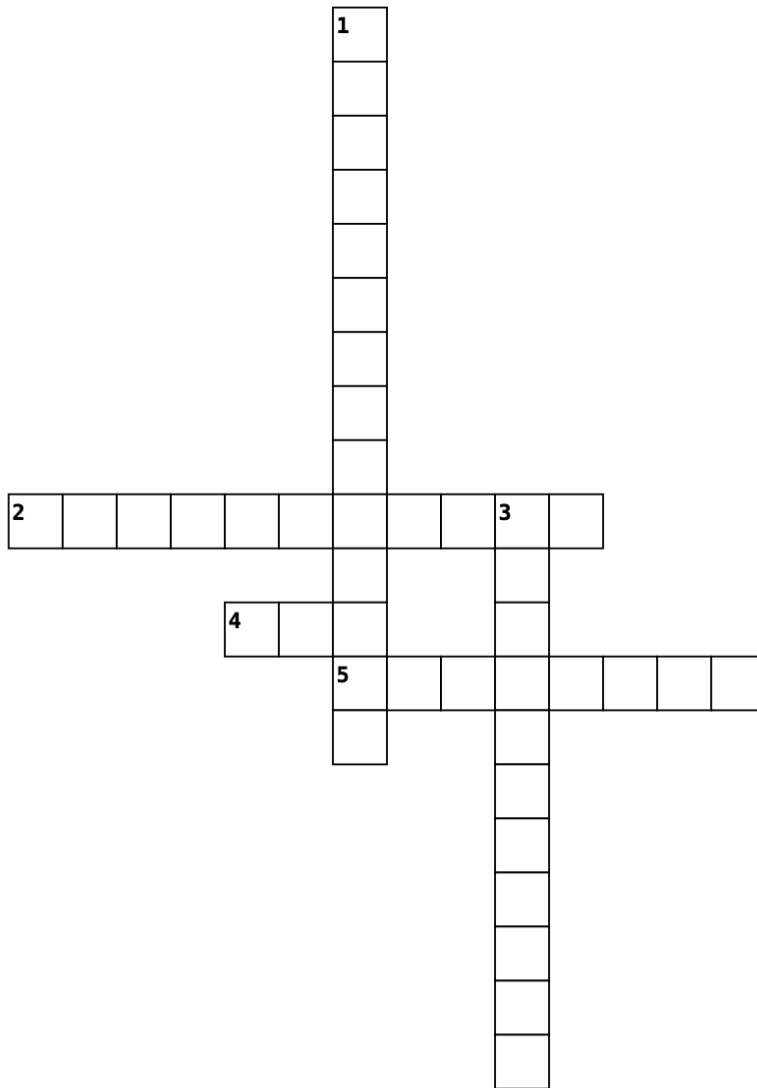
One idea, Attorney Chiapponne says, is for lawyers to establish independent review committees for experts in their fields. When thinking about the costs and benefits of such committees, lawyers should consider both scientific opinion and the legal process to determine when science is 'ready' to be used in the legal system. Attorney Chiapponne emphasizes that we currently lack definitive answers to these questions.

Attorney Chiapponne stresses that this case is **not about trying to keep out any evidence that could help a defendant;** it is about keeping bad science out of the courtroom. The same concerns apply, regardless of whether the prosecution, criminal defense, plaintiff, or civil defense is trying to use bad science. Bad science could even change the outcome of a trial, leading to unfair results based on questionable methodology.

*Name changed for privacy

Neuroethics crossword puzzle

Identify these Neuroethics Topics



Across

- 2. Improvement, often through technological or medical means
- 4. An implantable neurotechnology making headlines
- 5. Neuroscience and Law

Down

- 1. Neuroscience and Marketing
- 3. Right to Cognitive Liberty

A big thank you to affinity group members!



Robert Beets



Diana M. Urian



Jennifer Brown



Francisco Rosero



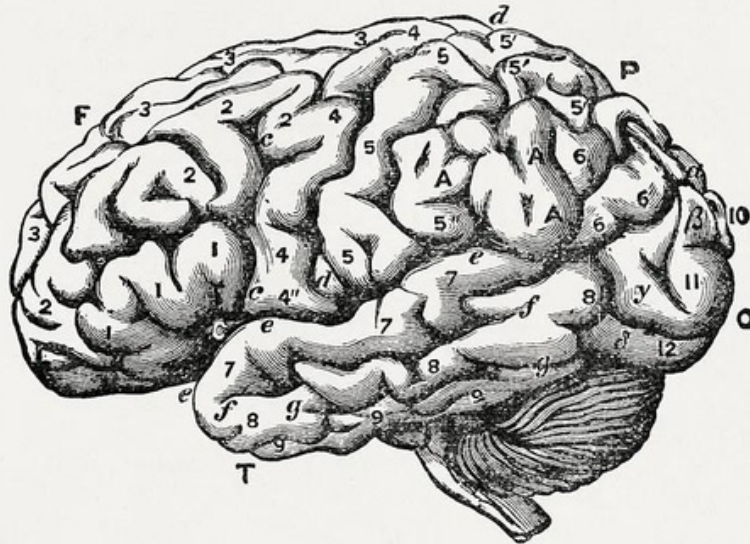
Nicole Chiappone

*(Credit: Amy Beth Bennett/
South Florida Sun Sentinel)*

And...

**Zuha Ajlan
Andrew Huang
Abigail Oppong
Adam Steiner**

Thank you for reading!



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