

Introduction: Understanding Genocide as a Means to Prevention

IN JANUARY AND FEBRUARY 2023, I was in Cambodia working at the National University of Battambang. I was staying in a small hotel not far from the city center, where one of the workers was a French immigrant who decided to stay in Cambodia more than a decade ago. He married a Cambodian woman, had children with her, and spoke the Khmer language fluently.

One day, he said something that really stuck with me. Referring to the Cambodian genocide that unfolded between 1975 and 1979, he said, “You know, these people, they are so nice, so kind by nature. How can you explain that they started killing each other like that?”

While researching this exact question, I discovered that, for many, the answer they would probably give is that they were simply following orders.

Around the world, the phrase “I was just following orders” is used in every conceivable context to justify why people do things that can aptly be described as “bad,” “immoral,” or “illegal.” I have heard this simple sentence so many times now that it is like an incessant chorus playing in my head.

Indeed, the “just following orders” argument has been used across many documented wars and genocides throughout history in different countries, on different continents, and with people from very different cultures. What accounts for the fact that this justification is used so consistently across time and place? Could it be that it reflects, at least in part, a reality in perpetrators’ brains – a reality of how we perceive ourselves that might be shared across all the members of our species? Moreover, does obeying orders alter our natural aversion to hurting others? From an evolutionary perspective, such a finding would probably make sense. After all, following rules is part of the blessing and the curse

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of being hyper-social animals, which enabled us to overcome many obstacles, but also led to committing atrocities.

Human behaviors are incredibly complex to study and understand, and can be influenced by a plethora of factors, ranging from our biology and our genetics to social, economic, cultural, and historical factors. This is certainly the case for a phenomenon like genocide.

Genocides do not happen suddenly. They happen because of a number of events, circumstances, and individual decisions that played out over many years. The genocide in Rwanda, for example, arose in a context of economic difficulties and political instability exacerbated by past and ongoing ethnic tensions. Following the colonial period in Rwanda, first under German and then Belgian rule, the Tutsis – a minority ethnic group – were often favored by colonial policies, which resulted in disproportionate access to wealth, better jobs, and educational opportunities compared to the majority Hutus and other groups. When Rwanda gained its independence in 1962, the Hutus became the leaders and frequently portrayed the Tutsis as the reason for every crisis. In 1993, the Radio Télévision Libre des Mille Collines (which can be translated as Free Radio and Television of the Thousand Hills), which was supported by the government, started to broadcast hate propaganda messages against the Tutsis and to dehumanize them. It was reported that the Tutsis were planning to kill the Hutus and take over the country. In April 1994, after a plane crash resulted in the death of the Hutu leader of the government, President Habyarimana, the Tutsis were blamed, and a genocide was launched against them. In only three months, about 500,000 to 600,000 individuals were murdered.¹

A somewhat similar pattern played out in Cambodia against any individuals perceived as not part of the Khmer Rouge ideology. Influenced by the communist ideology and by their willingness to create a classless agrarian society, Saloth Sâr (best known as Pol Pot) and the Khmer Rouge took power in Cambodia in 1975. These events followed years of instability after both a civil war and the Vietnam War. Immediately, the Khmer Rouge set about radically reorganizing Cambodian society. They forced people who lived in urban areas to work as farmers and split up families. They turned the entire country into a huge rice field that had to produce three tons of rice per year, according to the leaders' plans. Their plan was inspired by the "Great Leap Forward" campaign of Mao Zedong, former President of

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China, who pursued the total collectivization of agriculture. In the new society of the Khmer Rouge, individuals were given roles based on their gender and age. Opponents and intellectuals – or sometimes simply individuals wearing glasses* – were killed or re-educated. Every person who complained, did not work hard enough, refused a forced marriage, did not produce enough rice, met in groups, revolted, or was denounced as a traitor (whether true or false) was tortured and/or killed. Mass graves popped up everywhere in the country. In four years, a quarter of the Cambodian population was killed by the Khmer Rouge or died because of starvation or disease. This so-called “auto-genocide” ended in 1979 when the Vietnamese army took over the country.

The Nazi genocide, too, unfolded in the wake of longstanding instability for which a part of the population was designated guilty. The end of World War I left people in Germany, already traumatized by the war, in a situation of high insecurity. The Treaty of Versailles (June 28, 1919) set up a peace settlement that drastically impacted the economy of Germany. The Treaty required Germany to disarm, to lose territories, and to pay reparations to several countries. The cost of those reparations is estimated to be equivalent to \$442 billion in 2022. The German population was hungry and desperate, which gave Adolf Hitler and the National Socialist German Workers’ Party significant popular support. His party blamed the country’s instability on the Jews, the Roma, and people with physical or psychological disabilities. Despite being in a modern and educated society, the Nazi leaders were able to convince the population that those undesirables had to be “exterminated.”

The three above-mentioned examples are a simplistic résumé of very complex situations, with each of them deserving more than a single book to be fully understood. No single discipline alone can explain how and why they emerge, and how and why they unfold the

* It is often heard that “those wearing glasses were killed” during the Khmer Rouge regime. However, it is essential to note that simply wearing glasses did not guarantee a death sentence, nor was it an official rule under the Khmer Rouge regime.² While such incidents did occur, they were primarily a consequence of the Khmer Rouge targeting intellectuals as dangerous individuals. Thousands were killed merely because they had an education or belonged to a higher socioeconomic class, rather than having a rural background. Individuals wearing glasses were more likely to be associated with a higher social status, making them susceptible to being controlled or targeted by the regime.

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way they do. An interdisciplinary scientific approach is necessary. For instance, psychology may focus on individual traits and mental health. History may delve into previous group conflicts. Politics may examine the political situation in the country. Sociology may examine the group and the social environment. Anthropology may help us understand why a specific group is targeted.

And brain sciences, which are the main focus of the present book, can study the brain structure and functioning.

Trying to understand how genocide and mass atrocities can happen thus has enormous complexity. On the one hand, we have collectively recognized that being under the immediate threat of physical harm – such as torture or death – is a mitigating circumstance when obeying an order to kill another person.[†] But, clearly, many people have taken part in mass-extirminations without the existence of such threats. Wars and genocides involve the participation of thousands and thousands of individuals, with a plethora of factors explaining their group and individual actions. Our role, as scientists, is to help identify the processes that lead to such acts of destruction.

Crucially, understanding and studying the factors that explain mass atrocities does not excuse the actions of the perpetrators nor does it diminish their individual responsibility, an aspect that will be explored in more depth later in the book.

Rather, identifying the neural mechanisms associated with the execution of atrocious acts out of obedience has the potential to raise hopes of developing efficacious interventions to prevent blind obedience, even if there is still a long way to go. Unfortunately, however, when interventions are planned to prevent some behaviors or to promote some behaviors, the neural level is currently barely considered, except in some recent disciplines such as neuromarketing. This means that even if some changes are observed as a result of the intervention, no one really knows how those changes occurred and if some aspects of the intervention should be more emphasized to produce a greater behavioral change.

[†] International Military Tribunal at Nuremberg, No. 21948–04-09, “The Einsatzgruppen Case, Case No. 9, United States v. Ohlendorf et al., Opinion and Judgment and Sentence” (1948), 480, accessed June 8, 2016.

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In neuromarketing, the one contemporary exception to this generalization, it is widely assumed that consumer behaviors are driven by subconscious motives that questionnaires cannot detect. The discipline thus uses more objective methods such as brain scanning and physiological tracking. Neuromarketing has certainly proven its efficacy at influencing people's behaviors. It stands to reason, therefore, that neuro-based interventions could be similarly helpful for changing people's harmful behaviors towards others.

In the case of obedience, however, the question remains: Should such interventions target empathy and compassion, or rather target individual responsibility for one's own actions, or even other mechanisms? By using more objective and precise methods – by understanding how our brain processes the information in situations of obedience – we may be able to find strategies to help people resist blind obedience.

THE ROLE OF NEUROSCIENCE

I am sometimes contacted by people searching for answers to what happened to them or their families during wars or other events, hoping to find an explanation thanks to neuroscience for what they had to endure. Obtaining answers is clearly a critical part in the healing process. Unfortunately, the answer is not simple. Many biological, societal, cultural, and historical factors have been explored to explain how and why atrocious acts are perpetrated. Neuroscience, however, has only recently begun to address this question and may provide novel and complementary information. The objective of this book is thus to bring a new element into the equation by looking at the structure and function of the brain in relation to obedience and the perpetration of violence.

Notably, neuroscience is not a miracle solution to understanding genocides or other mass atrocities – as mentioned, a single discipline could not boast of having the answer to such a broad and complex question. However, in this book, I explain what is happening in the brain of individuals who have accepted and followed orders to hurt another person, and I offer significant insight into understanding how they can perpetrate the cruel acts they do. Moving beyond previous books and scientific research on obedience, this

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book thus seeks to understand immoral behaviors out of obedience to authority at a deep and individual level – that is, at the neural level.

Any decisions we make, any actions we perform, originate in the brain. The brain is a complex structure composed of trillions of neurons that produces our thoughts, our feelings, our decisions, our memory, our senses, and that regulates our body. While a high range of environmental and social factors can modulate how our brain processes information and computes decisions, the brain is nevertheless the central processing system. To generate actions, the brain continuously processes all the information received from our environment as well as our past and present experiences to compute a decision, which is then sent to our muscles to make us perform movements. Thus, to have a more complete overview and a better understanding of how people can commit atrocities when they obey orders, neuroscience has significant learning to contribute.

The most common approaches to neuroscientific research rely on physiological measurement, especially neuroimaging. Two crucial dimensions in neuroimaging are space and time, which provide insights into where and when brain activity occurs. Magnetic resonance imaging (MRI) is conventionally used to reveal with a very good spatial resolution the anatomical structure of a region of interest (the “where”). It is used not only when there is suspected brain damage, but also when medical doctors want to ensure that your foot is not broken or see if there are any tumors, cysts, or other anomalies in your body. fMRI, or functional magnetic resonance imaging, is an MRI technique that specifically measures blood oxygenation. Thinking, speaking, or moving involves specific parts of our brains, whose neurons suddenly demand more energy to fire. This request for local energy increases the blood flow roughly 4 to 6 seconds after a neural activity – especially the oxygenated blood in this region. While these changes are captured spatially by the MRI scanner, however, the lag between the targeted neural activity and the increase of blood flow prevents MRI scanners from providing a good temporal resolution of brain functions.

This is where electroencephalography (EEG) and magnetoencephalography (MEG) come in. These technologies offer a very good temporal dynamic of brain functions (the “when”), although they have a weaker spatial resolution. When clusters of neurons fire because we are thinking, speaking, or moving, an electrical current is conducted to the scalp

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through tissue, cerebrospinal fluid, and the skull. With electrodes positioned on the scalp, this current is recorded with a millisecond precision. Unfortunately, however, the specific source of this activity is much more difficult to determine, partly because the scalp has spread the electrical information. For instance, while the spatial resolution for fMRI is typically in the range of 1 to 2 millimeters (sometimes even less), it is typically around 2 to 3 millimeters for MEG and around 7 to 10 millimeters for EEG,³ resulting in differences of hundreds of thousands of brain cells. Being able to position the electrodes of the EEG directly inside the cranium at the surface of the brain allows a better spatial resolution, but such methods are reserved for animal studies or patients already undergoing surgery.

There exist many more techniques in psychobiology and neuroscience, such as facial electromyography, galvanic skin responses, heart rate monitoring, neuropharmacology, neuromodulation, and lesion studies. Some of those methods will be approached in the different chapters, when necessary. However, in the present book, most of the studies mentioned will be based either on (f)MRI or on EEG.

A central premise of this book is that when human beings perform actions, they are the only ones making the decision to follow or not follow an order, especially without the presence of immediate threats, as mentioned earlier. Thus, a crucial aspect of conducting this research is reiterating again and again that uncovering the neural mechanisms explaining how people can commit atrocious acts out of obedience does not offer an excuse or an escape door for people trying to justify their actions. Although obeying orders may be considered a factor diminishing one's own accountability in the eyes of the law, we should never forget that deciding to follow an order does not fully remove the agency of perpetrators. In fact, throughout history, several examples have demonstrated that people sometimes use the excuse of obeying orders to commit even more terrible acts.

During the genocide against the Tutsi in Rwanda, for instance, some of the cruelest acts ever recorded in the history of humankind were observed. Perpetrators did not simply obey the order to kill other human beings. They went further by conducting atrocities and acts of torture that are beyond imagination and went beyond murder. Even though obedience can be blind, it is also, often, cruel. Further, history is filled with examples of individuals who have taken enormous risks to

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save others, even strangers, as we will see in the book. Obeying orders may thus not be the only option.

NEUROSCIENTISTS ALMOST NEVER MEET NON-WEIRD POPULATIONS

If you come from a Western, Educated, Industrialized, Rich, and Democratic society, you are probably WEIRD.

In 2020, Joseph Henrich, a US anthropologist, published *The WEIRDest People in the World: How the West Became Psychologically Peculiar and Particularly Prosperous*.⁴ He conducted a very detailed analysis on how WEIRD people have their own culture, their own way of thinking, their own way of behaving, and how this brought the West to conquer most of the world in 1500 CE.

Because the West has been able to develop critical scientific knowledge due to its development, many scientific disciplines are WEIRD-centered. For instance, almost all the questionnaires used in sociology or psychology have been developed and validated on WEIRD samples. They were written by WEIRD researchers, with their own WEIRD culture and education. They have put into the questionnaires their own WEIRD definitions, their own WEIRD conceptions of life.

Neuroscience is no exception to this WEIRD-centrism. And the availability of neuroscientific technologies exacerbated the phenomenon. Neuroscience relies on very recent technologies that can cost several million euros and are used by people who have received a very long and specific university training. These technologies are clearly not available in many places on Earth. As a consequence, most WEIRD researchers recruit participants predominantly from their own WEIRD societies, often university students, who are convenient to test due to their easy accessibility. These researchers then draw conclusions about the human brain based on this limited sample.

This is of course highly problematic. First, the WEIRD do not represent the majority of the population on Earth. In 2008, Jeffrey Arnett, a US psychologist, calculated that roughly 95 percent of participants recruited in published behavioral research are from WEIRD societies.⁵ However, the WEIRD population represents only 12 percent of the entire human

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population. No need for a degree in mathematics to understand the problem. Nowadays, additional societies across the world have started to also acquire neuroscientific equipment and are running neuroscientific studies. This is notably the case in China or Japan, for instance, where there are numerous teams of active neuroscientists. Yet the huge majority of the world is still excluded. A team of researchers indicated that, in 2016, just 3 percent of the submissions to a famous journal in social neuroscience were from Central and South America, South Asia, Africa, and the Middle East.⁶

Second, we know that our social environments can strongly shape our brains. Recent findings in neuroscience, for instance, showed that our sociocultural environments influence neural activity during different cognitive, affective, perceptual, or attentional tasks.^{7,8} This makes it difficult to know whether neuropsychological functions discovered in WEIRD populations extend to “all human brains” or are culture specific. Not extending research to non-WEIRD populations is thus a terrible flaw in neuroscience. And this is the case for all disciplines.

Furthermore, I firmly believe that remaining solely within a laboratory setting and testing convenience samples is insufficient to fully understand the motivations behind genocide perpetrators and mass atrocities. While lab studies are critical for understanding how obedience alters our natural aversion to hurting others, how can we develop theories about obedience if we never talk to people who have been in the situation? How can we fully understand human behaviors without also conducting interviews with people to learn about their subjective experience?

These questions also supported my decision to undertake the highly unusual step in neuroscience of going into the field. I now travel the world with my portable electroencephalograms and my audio recorder as a means to better understand human behaviors. I also wanted to meet genocide perpetrators and talk to them, to try to understand them. I was – and I still am – convinced that it is only by considering what people have to say, and what we understand from the brain, together with contextual factors, that we will obtain critical answers as to why atrocities are conducted on the grounds of obedience.

Yet conducting field research in neuroscience is clearly a challenge, for many reasons. When I started to consider doing such research – in Rwanda first, and then in Cambodia – my colleagues largely told me that

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it was totally unfeasible. I did not obtain some research grants specifically because reviewers on the scientific panels evaluating my projects considered that they “raised deep concerns regarding feasibility.”

The challenges were, indeed, many: transporting the neuroscientific material to these destinations, recruiting populations that may be hesitant to meet or talk to strangers about the atrocities they committed, asking them to wear an electroencephalogram on their head while most of them had never seen electronic devices before, testing in dusty and uncontrolled environments, the list goes on. This is why such field research in neuroscience is extremely rare, with only a handful of researchers in the world doing it.

Part of this book’s objective, therefore, is to detail how such projects were conducted so that we can begin to see more of them in the future. I will thus hereafter briefly describe some critical steps to consider.

In many countries around the world, the methods used in neuroscience do not exist, so it is necessary to send research materials by plane. The simplest way would be to put the material in the luggage. However, everyone probably knows how risky it is to do this. A survey published in 2006 indicated that about seven bags are lost on every jet.⁹ Another recent investigation further reports that the chances of seeing your bags lost by the airline companies are drastically increasing.¹⁰ As I did not want to be part of those terrible statistics, especially when I transport such an expensive and precious cargo, I did not even consider putting the material in my luggage. Even though I have many insurance policies, if my cargo got lost, I would spend months dealing with administrative paperwork and miss out on important research activities. Rather I use the system of diplomatic bags to ensure that my boxes of material arrive safely at the closest embassy I can find – although this process is significantly more expensive.

Neuroscientists also like very clean and controlled environments to conduct their study: a proper experimental room, with electricity, no surrounding noises, no visual distractions. In the field, you are unlikely to find such five-star testing conditions. Dust on your apparatus, goats, chickens or dogs passing by, children staring at what you are doing all day long, noisy crows on the metal rooftops, heavy tropical rains are but a few of the testing conditions one might encounter. I usually prioritize buildings with electricity, at least, to ensure that my batteries will last for the entire day. In many villages in Rwanda, inhabitants did not have