# 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 Milles 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, wich 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-exterminations 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.

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. *f*MRI, 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 *f*MRI 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



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electricity in their houses, so we found ourselves testing in churches or bars. In Cambodia, we also tested in the backyard of a small shop, surrounded by rice fields. To minimize visual distractions, we find ourselves tapping into our very basic carpentry skills, building walls out of wood or whatever materials we can find around.

Then, we must explain to the local population what an electroencephalogram is and convince them that it will not hurt them. Many of the individuals we recruited have never used a keyboard in their entire life or even looked at a computer screen. And here we come with a weird contraption to put on their head that makes them look like an alien. Understandably, most of them are afraid because they think it will hurt them, alter their health, or that we could read their mind with it. Simply saying that it is a safe and non-invasive technique is not sufficient to reassure them.

For presenting the electroencephalogram and the computer tasks, we must therefore use very simple language. Usually, we use as an example the situation where someone has a temperature, and you put your hand on their forehead to feel if the temperature is too high or not. We then explain that the machine does the same, it is only touching their head to record what their brain can reveal to us, and not injecting something or reading their mind. We sometimes even make a demo where one of us wears the electroencephalogram in front of them to show that it is entirely safe.

And finally, we must always remember that we are guests in a country with a different culture, history, and sensitivities. When conducting neuroscience research with such populations, particularly those who have endured the trauma of genocide, we must approach the study with deep understanding and respect for cultural differences and sensitivities. These populations often bear the weight of profound experiences that have shaped their collective and individual psychologies in unique ways. Cultural norms, beliefs, and the societal impact of such catastrophic events play a significant role in how these communities perceive, interpret, and engage with scientific research. It is crucial to recognize that standard methodologies and interpretations, often developed in WEIRD contexts, may not be directly applicable or appropriate in these diverse settings. Therefore, collaboration with local individuals is crucial, as they provide invaluable insights necessary to contextualize research within their specific cultural and historical landscape.



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Clearly, field research in neuroscience is a challenge, but it is worth it to avoid WEIRD-centered conclusions about the human brain and to help humanity to understand non-WEIRD history and phenomena.

## CONDUCTING INTERVIEWS AS A RESEARCH METHODOLOGY

This book combines scientific research in psychology and neuroscience with interviews conducted with the perpetrators of genocide. As previously mentioned, combining interviews and experimental approaches is a powerful way to better understand mass atrocities.

Interview-based qualitative studies of perpetrators are important to understand how genocides or other mass atrocities can develop in our societies. Academics can indeed develop lab experiments or make in-depth analysis of demographic data or of historical precedents. However, we will never fully understand the implication of our results if we also do not speak with the persons who committed such atrocities. This approach helps to integrate theory, practice, and real-world cases, providing a more comprehensive view of the bigger picture. They are all critical if one wants to have the most complete overview possible of the problem. Undoubtedly, staying in an office or in a lab is not sufficient.

Shedding light on the subjective experience of perpetrators when they conducted atrocities is thus a necessary step towards a better understanding of such events. But trying to understand the behaviors of genocide perpetrators is not always well received by the general public. Popular culture generally describes perpetrators as psychopaths, cold-hearted individuals, or monsters who experience pleasure when they see their victims suffering. Although it may be the case for some of them, the reality is much more complex and troubling. In fact, such a simplistic view denies all the factors that can lead regular people to become perpetrators of horrific acts.

A specific personality trait, psychiatric condition, or neurological malfunction cannot simply be the cause. One cannot say that all the individuals who participated in the Nazi genocide had brain damage or were psychiatrically ill. Neither can one say that the hundreds of thousands of Hutus who participated in the genocide against the Tutsi in Rwanda had similar issues. In Cambodia, every adult was assigned a role in the Khmer Rouge's novel society (i.e., Palm unit, mobile units, soldiers, teachers, medical unit,



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prison guards, cadres, etc.). Refusal meant being considered as a traitor and risking being killed – thus participation was in the majority of the cases not the result of psychopathy or "being a monster." It is clearly difficult to think about ordinary people turning into evil perpetrators, but this is the task of those who seek to understand genocides.

The disturbing truth is that perpetrators are not that different from the rest of us. Past research, for instance, failed to observe that Jihad members planning terrorist attacks had any mental health problems.[11] Actually, most of them were educated, married, and had children. They felt lonely and isolated and were willing to join a group movement that shared a strong connection with their own values, but they were not suffering from psychiatric illness. Hannah Arendt, a famous political philosopher and survivor of the Nazi genocide, has already concluded that Adolf Eichmann, one of the main organizers, was not a monster. She saw him, rather, as a bureaucratic clown at the service of the Führer and sharing his ideology.[12] As Jewish survivor Elie Wiesel stated: "It is demonic that they were not demonic."[13]

Interviews conducted with genocide perpetrators have not been frequent. Some authors have argued that the rareness of interviews with genocide perpetrators is in part due to the psychological difficulties associated with hearing unspeakable atrocities while trying to understand the decisions of the perpetrators. It is something that cannot be improvised; it requires deep psychological and emotional preparation.[14] For sure, reading or hearing stories where perpetrators blindly attacked individuals in a church with machetes,[15] how others threw babies into trees to kill them, how some raped young girls and then cut open their bodies and ate their livers[16] is emotionally very difficult. Recitals of atrocities committed in wars and genocides can be appalling to hear. Academics or journalists choosing to interview genocide perpetrators must be prepared to preserve their own psychological wellbeing. Not everyone is willing or ready to hear such stories.

Moreover, it is important to acknowledge that interviews present methodological challenges, an aspect which can also reduce their reliability. Indeed, one of the main challenges is that the results are not objectively verifiable.[17,18] As the interviews rely on what the interviewees agree to share, some of the responses can be, consciously or



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unconsciously, false, distorted, attenuated, or incomplete. Furthermore, many former genocide perpetrators suffer from psychiatric diseases such as post-traumatic stress disorder[19,20] or addiction.[21] For instance, during our interviews, a former genocide perpetrator in Rwanda was completely drunk. It is a very frequent problem because abusing such substances helps perpetrators numb themselves to what they did. Admittedly, alcohol in this case was making the interviewee very talkative. But are his words reliable enough to be integrated into the interviews?

For instance, even if some individuals have been judged for their crimes, they may also keep hidden other crimes in order to prevent future or additional conviction in court. Others may deny their crimes as part of a psychological process aimed at rebuilding a positive image of themselves. Others again may distort their responses or find external causes to attenuate their responsibility. People are usually ashamed or want to forget what they did. In Cambodia for instance, only five people have been brought to trial for the decimation of a quarter of the Cambodian population by the Extraordinary Chambers in the Courts of Cambodia (ECCC, 1997–2022). Thus, almost none of the killers have been officially recognized or sentenced. Most of them have decided to never tell anyone what they did to avoid revenge or prosecution.

Analyzing qualitative data is also tricky because researchers have to avoid putting their own subjective appreciation of the data into the analysis. In psychology, a common method that we used as well to prevent the issue of subjective perspective is to analyze qualitative interviews as follows: the main researcher first classifies each answer into different categories based on what is reported in the interviews. Then, several independent judges are given the responsibility to read all the answers and to indicate in which category or categories they belong. The answers of those different judges are then combined, and the majority determines the final classification.

But overcoming the above-mentioned obstacles is worth it: interviews are a rich source of information. They provide insights from the persons themselves into how killings were perpetrated and why.

Yet finding and interviewing genocide perpetrators is extremely complicated, for several reasons. First, most of the time, the events happened decades ago, as it is difficult – sometimes almost impossible – to reach the perpetrators during the ongoing events or rapidly in their aftermath. As



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a result, perpetrators may not be alive anymore. Second, for many of the recent or ongoing genocides, the political situation in the country is such that the genocide is either largely denied or the ongoing nature makes it almost impossible to conduct interviews with the individuals involved.

There are, however, genocide perpetrators who are still alive and who are living in countries where the genocide is officially recognized, thus allowing interviews. This is the case for Rwanda and for Cambodia. However, the perpetrators of these genocides are growing older. In Cambodia, the Khmer Rouge indoctrinated thousands of children in their early teens and taught them to follow any orders to kill without hesitation.[22] Even considering the youngest children at the beginning of the genocide in Cambodia, the youngest "perpetrators" are nowadays at least 55 years old. This is already quite old for a country where the life expectancy is estimated to be 70 years old according to the World Bank.

In addition, knowing who a "real perpetrator" was is complex in Cambodia. Members of the Khmer Rouge also lost many family members because of starvation, or because they suddenly became considered as traitors by the organization and were imprisoned and tortured, even killed. They may also have been killed during the "year of revenge" that happened after the end of the genocide. In Cambodia, it is considered that the perpetrators also largely suffered; they are thus considered "survivors," and even "victims," as well as perpetrators. With only five individuals brought to trial for the entire genocide, with many perpetrators already dead, and with those still alive preferring to remain silent, it is very hard to estimate how many people participated in the killings and "extermination" process.

With all this in mind, it is incredibly difficult to find in Cambodia people officially recognized as genocide perpetrators and have them agree to talk and reveal their innermost thoughts and feelings.

After the genocide against the Tutsi in Rwanda, a court-based justice process commenced, but there were so many potential perpetrators that it would be impossible to prosecute everyone, and the process would have taken many decades to complete. The perpetrators would have died awaiting trial in their cells and prisons were already overcrowded. The Rwandan government thus instituted the Gacaca courts in 2002 to try the perpetrators of the genocide.[23] Instead of using professional judges, trials were conducted by laypeople in the form of a community court. Those recognized as



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"upright" were placed in the roles of judges and the entire community was invited to participate. The lay judges had to listen to everyone, determine who did what, and give the appropriate punishment. These Gacaca courts have enabled the identification of genocide perpetrators on a mass level.

It is still a matter of debate, however, just how many individuals took an active part in the genocide in Rwanda. Past research suggested that between 14 and 17 percent of the adult male population of Rwanda took part in the genocide, which represents between approximately 175,000 and 210,000 participants.[24] After the Gacaca courts, it had been suggested that the number could actually be between 600,000 and 700,000 participants, but those numbers also involve those who were looting or being present at roadblocks.

## CONDUCTING THE INTERVIEWS

In August 2021, when I flew to Rwanda with my partner Guillaume for research activities in neuroscience and to interview perpetrators, we were told that we would not have access to the prisons for the interviews because of the drastic increase in the number of Covid cases. My colleagues and contacts in Rwanda told me that it would probably be better to conduct the interviews in 2022. However, as I was already there and because of the unpredictability of the evolution of the Covid-19 pandemic that hit the world, postponing the interviews until the following year would actually not have been a safer option. But trying to find former genocide perpetrators by myself outside of prisons would have been almost impossible. People tend, understandably, to avoid talking about what they did during the genocide, especially to strangers.

I was not deterred. For the research activities we had to conduct in Rwanda, I fortunately was in contact with Prison Fellowship Rwanda, a local NGO whose aim is to foster psychological healing after the genocide as well as reconciliation between former genocide perpetrators and survivors. As Prison Fellowship Rwanda accompanies former perpetrators during their prison sentence and after, they thus know who has been officially recognized as a former perpetrator of the genocide. And since my planned research activities in neuroscience already involved recruiting them, I agreed that the interviews could also be conducted on former perpetrators released from prison. The approach worked.



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The day we were to conduct the first interviews and experiments, we woke at 5.30 AM; I do not quite remember the day of the week. We had to quickly pack our material, which consisted in roughly 30 kg of equipment, including two electroencephalograms, four laptops, electrodes, electronic-based gel, and of course, the precious questionnaires and the audio recorder for the interviews. We charged all the electronic equipment in the car, took our two research assistants with us and started driving in the direction of an eastern province of Rwanda, which we understood was just over an hour away from Kigali.

We had to hurry because the curfew due to the Covid pandemic started again at 8 PM. Believe me, you do not want to be out past curfew in Rwanda. One of our research assistants told us that if you are caught twenty minutes after the curfew time, you have to pay a fine of 150,000 RWF (the equivalent of $150), you have to sleep in the stadium in Kigali, and your car is confiscated for five days. In addition, the journey time of 1.1 hours suggested by online maps was purely theoretical. There is just a single road with tarmac in the direction of the eastern province, with a single traffic lane in each direction. And on that single road, there was a never-ending parade of very old and slow trucks. Thus, the return journey time was regularly more like four hours leaving us with only a few hours to conduct our research activities and the interviews.

In the first reconciliation village we visited, we met with François, a representative of Prison Fellowship Rwanda. Reconciliation villages exist in different provinces of Rwanda and are supported by Prison Fellowship Rwanda. In those villages, survivors and perpetrators live side by side as neighbors. People get to decide whether or not to live in these villages. If they do, they are provided with material to build new homes, critical for people in a low-income country. Being part of those reconciliation villages also involves participating in sociotherapy sessions and activities aiming to rebuild some sort of relationship between victims of the genocide and former perpetrators.

François came to meet us as soon as we arrived in the village. We were driving a big four-wheel-drive car in a rural village of Rwanda made up of mud houses with straw roofs. We were unusual visitors and were of course spotted from afar. François was dressed very elegantly, with classic long pants, a shirt, and a V-neck sweater. Like many Rwandans born before the



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genocide, François had learned French and appeared to be quite happy to practice with us.

After installing the equipment in the church, which had been converted into an experimental room for the occasion as it was the only building around with electric plug sockets, I went for a small walk with him. He explained to me what happened to him and his family during the genocide. During our conversation, we suddenly crossed the path of an old man who barely looked at us. François calmly told me, "You see this man, he killed 13 people during the genocide," and then he continued his story.

I must admit, I felt a small chill run down my spine. In the past, each time I had met with perpetrators, I met them in prison. Information about their crimes was expected. This was not my first time in Rwanda, and of course I was there to meet with them. But even though I had taken the time to get used to the idea that I would cross paths with many of them, I was really not expecting François' announcement, delivered so casually.

I asked François if he thought that this man would agree to be interviewed regarding what he did during the genocide, especially by a stranger. He told me that he would certainly be open regarding my questions during the interview. Being part of the reconciliation village involves having publicly recognized one's crimes during the genocide and being ready to discuss them openly during the sociotherapy sessions.

In the end, this man was one of the first we spoke to among many perpetrators living in the village.

In Cambodia, I faced many hurdles before actually finding a way to conduct interviews with former Khmer Rouge members. I contacted several associations, but either they never responded or refused to help, because "it took too many years to gain their trust and they did not want them involved in any research projects." I almost gave up several times because it actually sounded unfeasible. As a last resort, I contacted Georges Weiss, the director of Radio La Benevolencija, who told me that perhaps the Documentation Center Cambodia could help.

The Documentation Center Cambodia (or DC-Cam) is a non-profit organization for whom one of the main missions is to collect testimonies from the survivors of the genocide. I contacted its director, Youk Chhang, to explain the project – even though I had no idea if it would be yet another flop. But Youk did reply to me after only one day and offered an online meeting.



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He told me that the question of obedience to authority was crucial because the huge majority of former Khmer Rouge used it to explain that they followed orders and perpetrated killings. He, too, wanted to understand this phenomenon better. He nonetheless told me that the electroencephalogram sounded intimidating to him.

DC-Cam has several centers across the country, working with survivors of the genocide – both "victims" and "former Khmer Rouge cadres." Youk put me in contact with the local directors of those centers: Dr. Ly Sok-Kheang at the Anlong Veng Peace Center (in the north); Mr. Seang Chenda at the Kampong Cham Documentation Center (in the central part of Cambodia); and Mr. Pheng Pong-Rasy at the Takeo Documentation Center (in the south). I thought that the interviews would be complicated, as I was told so many times that the survivors rarely talk about what they did. That aspect, however, proved less difficult than expected. Since DC-Cam has been in operation for more than twenty years, they have gained the trust of the survivors who then agree to talk to them about their experience during the genocide. However, talking about their *experience* does not mean talking about what they *did*, as we will see in Chapter 1.

The electroencephalogram did prove to be a complicated part of the process. Some directors were very reluctant to use it as it was totally new to them. One even refused at first, saying that for cultural reasons, he did not want the survivors to be involved in computer tasks. Beyond convincing the potential participants, we thus also had to explain everything to the directors of the centers. It was clearly a historical encounter between neuroscientists and the local population.

The organization of villages in rural Cambodia is also quite hierarchical. Before being able to meet the villagers, we had to meet the village chief. On most occasions, the day before starting data collection, we thus drove into the different villages to meet the village chief or the deputy village chief. Upon their approval, we were authorized to meet villagers to explain the project.

The testing in Cambodia was much more complex than in Rwanda because if one participant was unhappy with the electroencephalogram for some reason (e.g., too long, not happy to sit for 40 minutes in front of a computer, did not like to look at a computer screen), we were very likely to lose the entire village. Each day was thus totally unpredictable. We



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nonetheless managed to obtain interviews with about sixty former Khmer Rouge and were able to analyze their reports.

## THE PRESENT BOOK

In this book, I offer insight based on my years of neuroscientific research combined with first-person interviews with the perpetrators of violence in Rwanda and Cambodia. What I have found is that the activity in some brain regions – although critical for understanding the pain we cause to others and our responsibility in the act – is reduced when people obey orders compared to when they are acting freely. In other words, when people accept and comply with the orders of someone else, they do not fully take the measure of the consequences of their action. Their brains do not process the information as it should.

Is such a result consistent with what genocide perpetrators report when asked why they participated in the massacres? Could it be critical to understanding why mass atrocities are conducted on the grounds of obedience?

These are questions I explore in the chapters to come.

Even though the majority of the book focuses on the situation of obedience to authority, I wanted to offer a broader perspective on the very complex question of participating in mass atrocities. Obedience represents merely one, albeit intricate and critical, determinant in the multifaceted dynamics characterizing such events. But other determinants should not be overlooked. In some chapters, I will thus also take the time to explore other equally important mechanisms at play, such as dehumanization or intergroup prejudice. I will also delve into the brain mechanisms involved for those giving orders, as they are a crucial part of any hierarchical system and bear critical accountability for atrocities committed. An entire chapter will further be dedicated to the psychological and neurological consequences of conflicts, wars, and genocides for both victims and perpetrators. Understanding and gaining knowledge of what happens in the aftermath of such events is important for understanding how a society can ever recover from such atrocities.

The book is written to be understandable by a broad audience. However, readers may find some sections more complex than others.



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I therefore provide a general conclusion at the end of each chapter, summarizing the main message of each chapter.

**CHAPTER 1.** This book starts by listening to individuals who took part in a genocidal process in order to understand how mass atrocities can take shape in our societies. Chapter 1 analyzes the many interviews I have conducted with former perpetrators of the genocides in Rwanda and Cambodia. For a deep understanding of what happened in their minds during the killing acts, we must dive deeply into their own words and perspectives.

A critical question I asked in this research was, of course, why individuals perpetrated the crime of genocide and/or why they did not stop working for the regime. Interestingly, in Rwanda the majority of perpetrators share the same phrases and explanations about why they killed, almost as if they had learned what to answer. Sentences such as "The reason why I did it was because of bad government that trained us to kill Tutsis," "I followed orders," "The bad government is responsible," and "I am not responsible as I obeyed orders of the government" were almost systematic. Indeed, claims that they were simply following orders of the "bad government" is a very common justification that a huge majority of the perpetrators reported in my interviews.

In the case of Rwanda, one might consider that since perpetrators had been in prison together and were talking to each other, they may have constructed a sort of common narrative to justify their acts and defend themselves during the Gacaca courts. But in Cambodia, the same justification was also used, again and again. None of the respondents admitted doing anything bad during that period, neither former soldiers nor those transporting prisoners to be killed. Yet all the respondents who agreed to answer this question said that they had to obey orders. It thus appears that obedience to orders strongly influenced their individual actions during the genocide.

**CHAPTER 2.** This chapter explores past experimental research to explain how obedience is studied in a lab context, as a foundation for understanding the neuroscientific research that followed. Experimental research, largely headed by the highly controversial work of Stanley Milgram, famously showed that humans can potentially



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kill another individual for the sake of the experiment they are involved in, even if they can hear the screams and pleas of the other person. These experiments showed that under certain circumstances, a majority of individuals could be coerced into inflicting harm on others at levels generally deemed unacceptable, even without any tangible social pressures such as a military court or job loss.

Critically, Milgram's studies on obedience, as well as the variants that have been conducted since, only allow us to study if, in a given situation, an individual will obey the injunctions of an authority figure. Milgram's studies were thus important for exploring situational factors that support obedience. However, no previous studies have allowed us to understand *how* it is possible that people commit atrocities when they follow orders. *How* can humans turn evil just when they follow orders while they would not act in such a way if they had not been incentivized by an authority figure? *How* does the simple fact of obeying orders have such an influence on people's behaviors?

*"How"* is a critical question but, strangely, one that has been largely avoided by experimentalists within the scientific community for decades. However, as this book shows, answering "*how*" is critical to better understanding human nature and trying to prevent future atrocities. Chapter 2 thus shows how human obedience is captured in an experimental set-up, showcasing that a different research methodology can help us understand "*how*" on a neurological level. By understanding the mechanisms of obedience, we will be better armed to prevent destructive obedience.

**CHAPTER 3.** This book then moves into the neuroscience research that allows us to understand better how obedience can alter behaviors. To understand how humans can commit atrocities when they obey orders, I had to target neurocognitive processes that are usually involved in moral decision-making. One of the most essential cognitive components for making decisions is the feeling that you are the author of your own actions, and thus responsible for the consequences. Academics have called this subjective experience the sense of agency. If you do not feel you have agency over your actions, you are less likely to feel responsible for the consequences of your actions. This reduction of responsibility can



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influence your decision to make good or bad actions, to decide between acting righteously or not.

We should in theory be able to recognize equal agency and responsibility for all the actions that we conduct. Yet this is not necessarily the case.

When people obey orders, they are undoubtedly the authors of their actions. Yet, as we see in Chapter 3, there are many social situations which diminish our sense of agency and our feeling of being responsible for the consequences of our actions, including the situation of obedience to authority. As this chapter shows, obeying orders impacts the sense of agency and the feeling of responsibility at the brain level. Further, working and living in some highly hierarchical and sometimes coercive social structures, such as the military, can also impact the sense of agency when people make decisions. It thus appears that hierarchy is a powerful facet of reduced feelings of responsibility and agency in individuals.

**CHAPTER 4.** Other critical neurocognitive processes involved in decision-making are moral emotions, notably the empathy we may feel for others, and how guilty we feel regarding our decision to hurt them. Humans, like other mammals, have the capacity to feel what others feel. They have empathy. Empathy is a capacity deeply engrained in our biology and is explained by shared neural activation when we both suffer or witness another human suffering. This innate capacity to feel empathy for others, be it for their pain or emotional states, is a critical cognitive and affective process that prevents us from hurting others.

In the case of obedience to authority, our inner aversion to hurting others should prevent us from obeying even when ordered within a hierarchical setting to hurt other human beings. Yet, as we will see in Chapter 4, complying with an order may alter this inner aversion. The research results showcased in this chapter suggest that our brain reduces the processing of the pain of others when we follow an order.

Moreover, when we transgress social norms, for instance by hurting someone physically or emotionally, we usually experience a feeling of guilt. Guilt is a powerful emotion because if you feel guilty about an action, it is less likely that you will repeat the same action in the future. You may even be willing to make amends and beg for pardon. Yet, I



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observed that activity in guilt-related brain regions was reduced when people obeyed orders compared to deciding to perform the same actions but freely. Chapter 4 thus illuminates how moral emotions are impacted when we follow orders – even immoral ones.

**CHAPTER 5.** While the first four chapters focus on unraveling the neural mechanisms at play for those who have obeyed orders and perpetrated violence, Chapter 5 turns to those who order the act of violence. Even if they do not execute the action themselves, they also bear responsibility for the violence that occurs under their command. Indeed, the behavior of those in positions of authority has a significant impact on the behavior of those below them, and understanding how authority is wielded and how decisions are made by commanders is essential to understanding the dynamics of obedience. By focusing not only on those receiving orders, but also on those giving orders and on those transmitting orders, researchers can gain a more complete understanding of the factors that influence obedience and develop strategies to promote more ethical and responsible behavior at all levels of the hierarchy.

Neuroscience research has revealed that giving orders also impacts the way the brain processes information and behaviors. In different studies, we observed that giving orders leads to a reduction of the sense of agency and moral emotions towards the pain of victims. Further, the chapter shows that being in an intermediary position, by simply *transmitting* orders received, can lead to a drastic increase in destructive obedience. Chapter 5 thus reveals how hierarchical situations can actually be very dangerous and how they can open the door to atrocious actions.

**CHAPTER 6.** Wars and genocides only bring desolation. Chapter 6 is about how surviving wars and genocides impacts mental health and can lead to feelings of revenge, which in turn may constitute a risk for future atrocities.

We often think about the dramatic psychological consequences for those who survived extermination programs or those who witnessed their families and friends being killed or mutilated. The strength that is necessary to survive such events and to overcome the psychological distress is enormous. Massive psychological trauma leaves a long-lasting



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imprint on individuals, who may suffer notable life-long post-traumatic stress disorder (PTSD) symptoms. Moreover, the effects of the trauma can also extend to the following generations.

Importantly, the psychological disaster observed in the aftermath of a war or a genocide does not only touch the victims, their relatives, or their descendants. It also has disastrous consequences on the mental health of those who commit acts of atrocious violence and their descendants. In Rwanda, many former perpetrators, as well as their children, suffer from mental health issues, such as PTSD and addictions. For instance, the generation of children born after the genocide is called the "forbidden generation," because instead of going to school and growing up as children, they had to rebuild the country, they had to take care of the land when their fathers were sent to prison for their crimes. They also have to carry a strong feeling of their parents' guilt as a family burden. Military veterans or military still active who have witnessed or perpetrated an act in combat that transgressed their moral values can also develop moral injuries, which may involve a persistent sense of guilt, shame, regret, remorse, depression, self-loathing, apathy, contempt, cynicism, or resentment, as well as PTSD.

Chapter 6 argues that in order to stop the cycle of conflicts, we must also understand how both victims and assailants are impacted at the psychological level by their respective experience, and how to help them overcome their demons.

**CHAPTER 7.** The final chapter adopts a more positive tone by focusing on disobedience and on people who risked their lives to save others in adversity. Several stories can actually be found of people who courageously rescued those in danger. In 1994 for instance, a pastor named Gratien Mitsindo refused to give up on more than 300 Tutsi he had hidden despite facing the Interahamwe, the Hutu militia responsible for the genocide in Rwanda. "I was determined to save the lives of the people I hid, and I was prepared to pay any price to achieve that," he said.[25] Pastor Gratien Mitsindo has been officially recognized as a "Righteous Among the Nations." While such stories receive universal praise, such highly altruistic behaviors are rare, and the history of nations is instead plagued by immoral acts of obedience that have caused the loss of countless lives.



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Even though such stories are rare, history has fortunately shown that some individuals do resist the social constraint of receiving orders when their own morality is of greater importance than the social costs associated with defying orders. By presenting sociological, psychological, and neuroscience research designed to better understand the profile of those who risked their lives to rescue strangers in times of war, this chapter asks what makes this small subset of the population react differently than others and what hope it can bring to interventions designed to help people resist hate propaganda.

As this chapter shows, even if rescuers are few, they offer a glimmer of hope to show that all human beings potentially have the power to overcome hate.

## A SINGLE LIFE MATTERS

Together, these chapters support my argument that obeying orders impacts the functioning of the brain, which helps to explain how people can commit atrocities when obeying orders.

But as mentioned in the Preface, neuroscience is not a miracle solution. Even if we arrived at the point of understanding perfectly why people comply with immoral orders at the deepest levels, it is highly unlikely that we would be able to prevent "everyone" from complying with such orders. It would be utopian to think that there is a simple switch to determine when one should follow a rule and when not. Furthermore, the concept of morality, particularly what is deemed "right" or "wrong," shifts dramatically during wars and genocides. This adds a layer of complexity to the already challenging question of moral behavior under extreme circumstances.

But neuroscience definitely has to take part in this line of research, as all the information surrounding us is processed by the brain. It is the brain that uses this information to compute a decision, and it is the brain that sends the command to our muscles, making us act. Neuroscientific research can help identify individual differences in neural functioning that may contribute to differences in how we process (dis)obedience. This knowledge can be used to develop personalized interventions that take into account an individual's unique profile.

Even if the approach works for only a very few people, even if it helps save just a single life, then that research is worth it.



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