DIRITTO PENALE
E UOMO
Criminal Law and Human Condition

Intervista

Looking for the person between mind and body. Interview with Joseph E. LeDoux

Alla ricerca dell'uomo tra mente e corpo. Intervista a Joseph E. LeDoux

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Good afternoon – good morning for you – Professor LeDoux. We are here to talk about science, about neuroscience, which is your subject, and about how science could generate new questions, or give solutions, on issues that are linked to ethics, morality and law. I have listened to an interview of yours with Prof. Gazzaniga about the problem of free will. And free will is also the title of a song of your group, *The Amygdaloids*. Of course, we probably don't have an answer, we don't know how free is our will. The question is do you think that science could help us, now or in the future, to answer this kind of question?

I think the role of science is to lay out what we know and what we don't know. And I think when you have that information – where we are today and what we understand about the brain and free will and so forth – we don't have an answer, but maybe we can think about it in a more complex way than simply «yes or no». For example, if we take the kind of behaviors that I study primarily, which is responses to danger, we can identify five or six levels of responses that go from completely automatic to more intentional and controlled.

So, the first level would be a reflex. If you step on something sharp, your leg withdraws; there is no consciousness involved. You just respond because of the way your nerves are connected.

The next level would be something like an instinctual behavior, like freezing behavior. You encounter a snake or a robber or a mugger on the street, and you see the danger posed by this person who is aggressive and is about to attack you. And the first thing you do is to freeze. And as you freeze, and that freezing response is an innate response to a sudden unusual stimulus.

Another level is that we can learn how to behave in certain ways by the consequences of our action. So that's called goal-directed behavior, or instrumental action-outcome learning, whatever you want to call it. It is a kind of behavior that is acquired by its consequences. Therefore, if every time you go to a certain restaurant you get a good meal, then you would go back there, because you've been rewarded for being there. However, if you have a bad meal, you stop going to that restaurant because the consequences are not good. That is a kind of trial and error learning that we – and animals too, especially mammals – use to learn about what's useful and not in the world.

Now, another level, though, would be a habit, which is one of these goal-directed behaviors that has been acquired by their consequences but that has become so routine that every time you see the stimulus you perform the action, not because you've been conditioned to it. It's not like, you know, a tone that paired with a shock that causes freezing. That's not the same thing. An act of habit is a behavior that was goal-directed--achieved a goal. However, over time, it's become so routinized and so often occurs, that it is no longer related to the goal. Let's take smoking cigarettes, for example. You know, maybe you enjoyed it at first, but now you do it all the time because you can't stop, because it's become a habit.

Then, the next level will be using a kind of mental model, which means that we create an understanding of the world in our minds. Our minds have nonconscious or unconscious mental models, but we also have conscious mental models. An example of a nonconscious mental model would be your cognitive map or spatial map of a city: you know where the streets are and how to get around. So you use that map in your head to navigate how to get to the restaurant you want to go to. You don't have to think about it; you just have that information and you go there. But you are using information that you've stored and are calling upon it internally. It is not about the stimulus so much. You're using the streets to kind of guide where you go but it's the map that tells you where to make the turns and so forth. We do all this unconsciously. Now, we can also consciously decide, let us say «I don't know the way to the restaurant, but someone told me to make three right turns and two left turns». I can remember that information and say, okay, I took a right and I am taking a left and right. We're bringing a higher level of decision making there.

And all of those can probably come into play in a criminal situation, where you might plan to harm or even kill someone, or might have a reflexive response, because somebody startles you and you hit them and knock them out.

Yes. That's right. This is exactly one of the points I wanted to talk about. Let's think about self-defense, for instance. Self-defense is an issue that is often discuss in the United

States, and in Italy too. So, self-defence could be exactly what you told: you react, without consciousness, without thinking... You are not planning to hurt someone or shoot someone if you have a gun. You just do it. What about personal responsibility, in such cases?

Right. Most of our behavior is controlled non-consciously. And, you know, that's kind of a problem for the law, because we can say: it's my body that's performing the behavior, but my conscious mind is not. So who am I? Am I my conscious mind or am I my whole body?

Because the law treats it as pretty much you are one thing, and for the most part we are one thing, but… perhaps the only part of our brain or body that is not in perfect tune with the rest of the brain and the body is our conscious mind. The human conscious mind is the only entity in the history of evolution – the four billion years of evolutionary history – that has ever been able to make a decision that goes against the greater good of one's body.

Think, for example about suicide: there is really no convincing evidence that animals commit suicide. There are certain behaviors that certain animals perform, but there is no way you could know whether that animal is choosing to end its own life. To even know that a life has an end is a complicated thing. You know, we have a kind of brain that allows us to know we have a beginning and there is an end coming at some point. Therefore, we guide our behavior on the basis that we are going to die. We plan, we work and when we get older, we stop working. We have saved enough money and we think that it will allow us to get to the point when we die. We have many thoughts about death that are based on our assumptions about, you know, what death is going to be. Therefore, to choose not to live is a very complicated thing, because that means that the billions of cells in your body have given their rights to live over to your conscious thoughts. All of those cells, in fact, are working to keep your body alive; no matter what you are consciously doing; that's what your body is trying to do, keep you alive. Yet the conscious mind can say, no, I'm done with that. I'm going to kill all of the billion other cells because I don't want to live anymore. This one little part of the mind is controlling the destiny of the rest of the body.

We can also do something that is very dangerous for us, for the sake of someone else, for example, now in the pandemic situation, there are doctors who kept on doing their duty despite the danger.

Right. The conscious mind is a beautiful thing. It has great properties, but it also allows for narcissism, for greed and hatred. Therefore, you know, it is a complicated thing. It has good points and bad.

I have seen a video where you spoke about meditation. We usually are never in the present moment, whereas other animals always live in the present. We are used to thinking about what we are going to do afterwards or we have just done. So, it's very difficult for us to be in the very moment where we live.

Yeah, that is true. We have a prefrontal cortex, that's an area of brain that enables us to envision the future and that allows us to do great things. To design a house, to build a building, to write a novel or a song, to play a flute. You know, it's a very creative process.

You imagine something that doesn't exist and you make it. Other animals are very limited in this sense, they make nests and so forth, but they don't build the Empire State Building. They don't write an opera. One of our greatest talents is our ability to envision the future and move towards it. But it's also the source of our greatest problems, which is worry. We worry because we have a brain that can see the future…

It is the same with crime: all animals can kill, but only humans can plan a murder. If you plan in advance to kill someone it is something conscious. I mean, it's not simply a reaction to fear, danger or whatever.

Planning is an interesting topic. We can also ask the question: might we be able to have unconscious plans, nonconscious plans? In other words, every conscious thought is based on what was just nonconscious.Your thought is being shaped unconsciously and then all of a sudden it is in your conscious mind. However, that means that some of the plan is happening underneath your conscious mind.

Again, it is a very complicated, difficult issue when it comes to making a decision about whether someone is responsible, because what level of the mind and brain are we going to judge when we deal with responsibility? Obviously, sometimes acts are literally premeditated – I'm planning to do this, I'm going to kill that person –, but there can be cases in which plans take place non consciously; we know that from cognitive science, a lot of planning happens nonconsciously. If you have some bad history with someone, I imagine – I mean, I don't have proof of this – there could be a kind of nonconscious planning that is shaped by your bad history with that person.

Ultimately, when the act becomes premeditated, you're conscious of that plan and so you carry it out.

So, at some point it becomes conscious. For example, if you buy some poison or buy a gun to kill someone…

Well, if your mind is creating ideas, the concept, the thought – not a conscious thought –of buying poison may be working underneath. It is not in a Freudian way. It is just the way memory works. So memory and conception operate nonconsciously. Do know the French art critic, Roland Barthes? He said, you know, «The writer doesn't write; language writes». The writer is just kind of a vehicle for carrying out what is in the mind.

In psychology, it is called flow. Something similar to an autopilot.

Yeah, autopilot. You are writing and you like what you are writing, but you are not planning every word. It is as if you have a concept that is living before you start writing because it is based on what you know and what you understand. Therefore, a person that has a concept of poison and an association of that concept of poison with some person, then that information can be, you know, coming together nonconsciously. And the conscious act is just in the last part.

Okay. But do you think that this could change our idea of responsibility, especially for the law?

I'm just laying out what the science is. Then in terms of responsibility, we have to decide what the person is. Is the person the conscious mind,or the level just before consciousness as well? Or does it include your habits, your passions, your hatreds and other things that might be below the conscious level that don't ever necessarily come up, but may cause or prime you in a certain way?

We know that the memory phenomenon of priming takes place nonconsciously. Let's take a classic example: I give you the letters "u, r, s, e" and I show you a picture of a hospital and I ask you to put an end there. You write "nurse". What if I show you some money? You write "purse." So that the stimulus primes you to complete a piece of information that is already in your mind. Therefore, you might have these ideas, these concepts in your mind and in the presence of a stimulus – someone you don't like – that concept is brought together and tips you in a certain way. You didn't do it intentionally. It is just, you know, your mind did it. Your brain did it. But how much of you your conscious mind is that? Before we can answer that question about responsiblity, we have to decide, as Mike Gazzamiga's book says, "Who's in Charge?". And that's a terribly complicated question.

One thing science tells us is that everything is much more complicated than we think, because simplifying is very dangerous.

I think that, in the criminal context, if the jury understands how complicated it is, that makes the prosecutor's job much harder. However, it may also make it safer for people, because, you know, if you do not have a full understanding of where behavior comes from, it's almost criminal to send someone to jail without that understanding. We don't have a full understanding, but we have some.

One thing you discussed with Prof. Gazzaniga is if punishment is useful, if it is an efficient way to deal with crime, because the idea we have got is that punishment is to prevent crime or to keep people safe from crime.

Well, I haven't followed child psychology in a long time, but I know when I first got into the field there was a strong sentiment that punishment does not get your child to do what you want. You have to use positive reinforcement as well. I mean, you can – sometimes you have to – be a little negative. Nevertheless, if you are too harsh, it just creates helplessness.

In terms of adults, we have better understanding, so we should be more responsible than a child. I don't know what the statistics are, I'm not an expert in law and the brain. What is the outcome in terms of what happens to a person when they get out of jail? I don't know. I would think that the principle of learned helplessness is very important though. The more helpless you feel, the less opportunity you have to change yourself.

And to improve. Yes. You spoke about fear: now, in the pandemic situation, we have a feeling that fear is becoming an instrument of social control. Most of us are doing things that we never thought about doing – closing, you know, in our houses, sheltering or not getting out, not kissing friends – because we are scared. We are somehow discovering this emotion, because in my generation – I'm 60 – we have never been so scared in our life.

Yeah. Well, you know, it is a new threat. So, yeah, a lot of people are afraid. I am afraid. I am worried. What's more, we have never seen the virus, right? Fear is usually thought of as an emotion that occurs when you are in the presence of danger. Now we don't know when we're in the presence of the virus. Therefore, this is anxiety. It is worry about what has not happened yet. We don't want to get the virus, so we're worried about how to behave in order not to get it.

It is even worse because we never know when we can feel safe.

Right. Yes.

You wrote a book about danger. In your latest book, "*The Deep History of Ourselves*", you spoke about danger as well. It is important for our evolution.

The point of the book was to discuss about how far back in evolution does danger go? You know, trees or plants too respond to danger, they withdraw their roots and conserve energy when it is too hot and so forth. Bacteria respond to danger. And you know, bacteria are basically the oldest living organisms on earth. They began about 3.7 billion years ago, and they have been alive ever since. To get through the day to survive, they have to detect danger, incorporate nutrients, balance fluids and ions, thermo-regulate and reproduce.

Those are the same things we do. We eat, drink, thermo-regulate, go inside, turn on the air conditioning, use thermoregulation in your body as well. We reproduce. The things that keep us alive are the same that keep bacteria alive. This has nothing to do with psychology. But when we eat, we enjoy eating. Hunger is unpleasant, taste is pleasurable. We think of danger as fearful. We think of sex as enjoyable. We think of being too cold or too hot, you know, in a certain psychological way. But the psychology of that is a kind of afterthought. The whole point of that is to keep us alive, not to make us feel good or bad. And to feel good or bad, we have to have a brain that can know that that experience is happening to us. And that's something the human brain is especially good at, is being self-aware, to know that the snake is going to bite me or to note that the virus is going to infect me. It is often said that fear is universal because people, all around the world, express fear of faces.

But I don't think it is fear that's universal, it's danger that is universal. Fear is the conscious experience you have when you are in danger. That is something that is very personal, because my experience of fear is different from yours, because we have lived different lives and have come to understand fear in slightly different ways. That's true across cultures as well. So even though we can speak a word like "fear" and translate that into Italian… what's the Italian word for fear?

Paura.

You have that word and in French you have something else and in Swahili, something else. Therefore, all of these cultures experience fear in different ways. Only because we have a word we can translate across languages. We then think it is the same experience, but every culture is different. Fear is individual and cultural. It is not innate, it

is not given to us by evolution. Evolution gives us the ability to understand danger, to detect and respond to danger. Fears, instead, are personal constructions, given who we are, the culture we live in, a world we live in, our understanding of what danger is.

Well, so said, maybe law should use science but also culture, because we must take into consideration people's motivations, which are different for everyone. You said experiences, unconscious experiences, are different for anyone of us. Of course, if you judge someone for a crime, you must consider what really happened. Therefore, you must take into consideration all the different aspects, and science could be useful to do so.

Yes, I think that, in the end, we are simply a product of our genes and our experience. We don't know enough about genes to say that okay, this gene caused you to do that. There is no gene that makes you do anything. But genes assemble your brain and so they assemble it in a certain way. Experiences modify the genetic background of the brain. And we are certainly products of our experience. And I think that's why social programs are important, because they recognize that everybody is not the same. We are the same as people, but we all have different experiences. And some people need more help than others because they didn't have the opportunities.

Anyway, again, I am not saying that we're ready to make a law on the basis of any of the things I'm talking about, because I don't know enough about the law…

Well, neuroscience is entering the court already, prosecutors and criminal lawyers use brain scan, and genetics to prove guilt or innocence. What do you think about it?

I don't think we're ready for that. I don't think we're ready to read minds from brain scans. Personally, I have never accepted an invitation to be an expert witness, because I think we don't know enough. We know a little bit and a little bit is enough to get you in trouble. Neuroscience can help us to know about how the brain works, but it can't say «this person killed somebody or didn't kill somebody». You know, we're just not there.