

WHAT IS CONSCIOUSNESS AND WHAT IS IT GOOD FOR?

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What do you see around you right now? What do you hear or smell? How are you feeling—happy, sad, bored? And what thoughts are in your head? All the sensations, feelings, and thoughts you have every day are part of what is called your conscious experience—something that all humans have. But do they have a purpose? Would you act the same without them? These are the questions we will address in this article. We will first introduce the concept of conscious experience and then review the methods that scientists use to study it, which is not an easy task! Finally, we will explain why it is important to study consciousness at all.

WHAT IS CONSCIOUS EXPERIENCE?

Look at everything surrounding you right now. The computer screen upon which this article is displayed probably stands on a table. On this

PERCEPTION

The process of using our senses to capture signals and the interpretation of these signals in the brain. For example, our eyes (sensors) capture light (signal) and we see an image (interpretation).

CONSCIOUS EXPERIENCE

“What it feels like” to experience everything you can experience: emotions, sensations, feelings, and even thoughts. Conscious experience goes away under deep sleep.

SUBJECTIVE

Designate something that depends on your point of view and can vary from one person to another.

table, there may also be some strawberries you are planning to eat. You can have thoughts about the strawberries and objects you see: you can tell what color they are, and if they are warm or cold, for example. The information you get through your senses is called **perceptions**. Beyond perceptions, you can also feel whether you like each object or not. You could grab a strawberry and feel its sweet juice filling your mouth and be happy about it. Finally, you can remember things that happened in the room you are in, like when you used to play with your dolls, or when you celebrated your birthday there.

Everything that happens in your mind—including perceptions, emotions, thoughts, and memories—make up what is called **conscious experience**. You can be aware of all those pieces of information and feelings at any time, every second of your day. You cannot stop this flow of sensations and thoughts even if you want to—consciousness cannot be turned off. Every moment you are awake, you are experiencing something.

CONSCIOUS EXPERIENCES ARE FOR YOU, AND YOU ONLY

Conscious experiences are said to be **subjective**. This means that they belong to you and to you alone. No one else can directly feel the sweetness you feel eating a strawberry the way you feel it.

To make this clearer, imagine calling a friend on the phone—someone who has never been in the room you are in right now. You could describe the color, size, and texture of your environment; and you could tell your friend whether you like the room or not. But your friend will never feel exactly the way you feel in this room.

Experiences vary widely from one person to another, and the range is even wider when you consider other living species. You, because you are human, can have a rough idea of what it feels like for another human being to appreciate the taste of a strawberry, but you can have no idea what it feels like [1] for bees to sense the direction of the North Pole, for example.

Yes, honeybees can sense the planet’s poles! (Figure 1). For humans, the direction of the North Pole is information we can access by looking at a compass. But you do not, and probably never will, directly *feel* what it is like to gather that information through one of your senses. You do not need to use a device like a compass to know that a strawberry tastes sweet. In the same way, honeybees do not need a compass to know where the North Pole is, they just feel it.

Figure 1

Honeybees can sense Earth's poles. It is as though they have a compass inside their bodies that can sense the direction the North Pole is in! This ability helps them to navigate. In addition to honeybees, some kinds of turtles and birds possess similar abilities. Humans will never know what it feels like to sense the North Pole the way honeybees do.

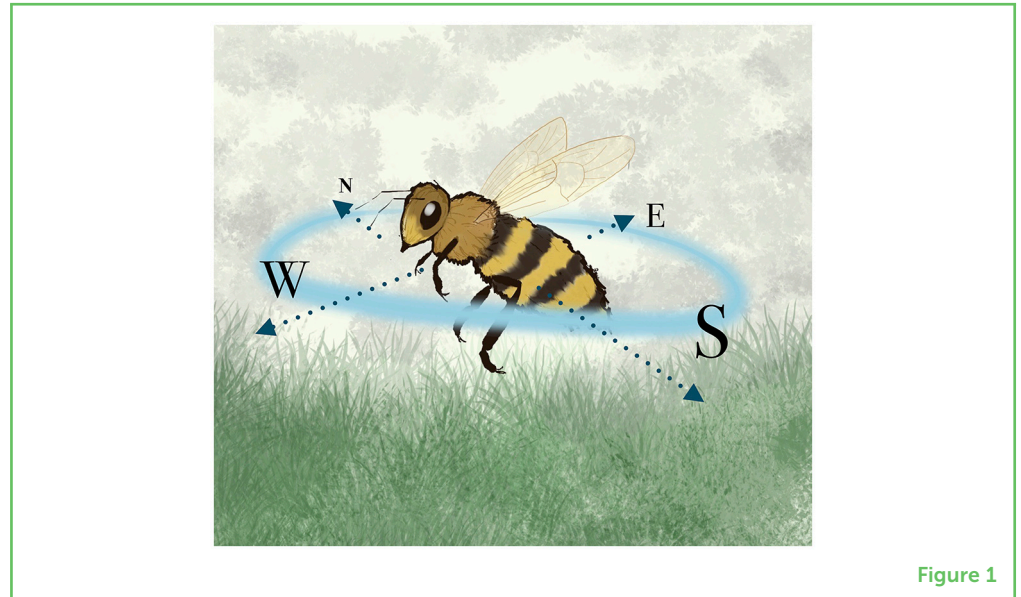


Figure 1

HOW CAN THERE BE A SCIENCE OF CONSCIOUSNESS?

Knowing that honeybees can feel the direction of the North Pole is completely different from actually feeling it. And we cannot ask the honeybees to tell us what it is like! Now you may wonder: If no one can see, share, describe, or measure conscious experiences, how can scientists study consciousness [2] (Figure 2)?

Figure 2

Scientists have several ways of studying conscious experience. **(A)** People can report their experiences to scientists. In this example a child is talking about an image of a bunny they saw. **(B)** Scientists can use neuroimaging techniques to take pictures of brain activity, which they can view on a computer. **(C)** A person's body reactions, like heart rate, amount of sweat, and where their eyes are looking, can help scientists understand the person's conscious experience. None of these methods are painful!

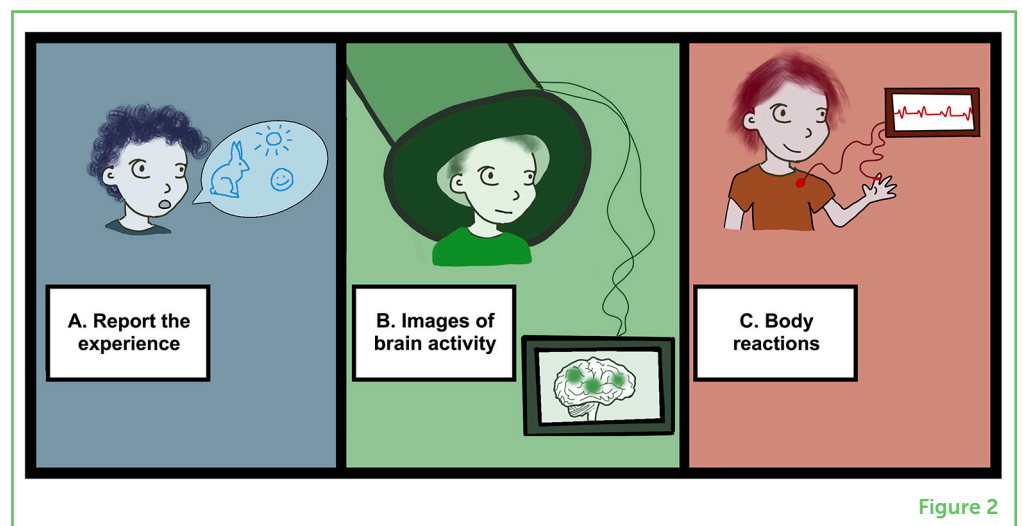


Figure 2

As mentioned earlier, one way for others to know about your experience of eating a strawberry is for you to communicate it with words. You can explain what you feel when you eat it. You can describe its sweetness and the juice filling your mouth. You can report many details about your experience. In this way, scientists can have partial access to what you are experiencing. However, the method of just asking people how they feel does not work on other animals. And it only works for awake human beings who know how to speak, and

NEUROIMAGING

A set of methods that make it possible for doctors and scientists to visualize brain activity on a computer screen.

HUMANATONS

Imaginary beings that appear and act as humans but lack consciousness. In the field called philosophy of mind, they are known as “zombies”—but are nothing like the ones from Hollywood.

who *can* speak. Some mental particularities, illnesses or injuries can indeed make someone unable to speak.

Scientists can also measure the brain activity related to an experience. These techniques are called **neuroimaging** because, using them, scientists literally get images of brain activity on a computer screen. However, there is not always a perfect match between the images scientists get from the brain and the experience itself. For example, scientists cannot tell the difference between the thought of a banana and the thought of a strawberry just from neuroimaging techniques.

Another way to access a person’s conscious experience is to look at their bodily reactions. For example, if you are afraid of thunder, your heart will most likely beat faster when the sky lights up: scientists can measure that rhythm. While scientists can never be absolutely sure about what caused the acceleration in your heart rate, they can use a type of math called statistics to gain confidence in their reasoning. Thanks to all these tools, scientists are slowly starting to gain a better understanding of how consciousness works.

A “HARD PROBLEM” REMAINS

While consciousness scientists have tools to understand how consciousness works, they still must deal with a very difficult problem that will keep them busy for a long time. This problem is: why do we have conscious experiences? This question is so hard to answer that people who study conscious experience actually call it the “Hard Problem of Consciousness” [3]. Let us try to make it a little easier.

The hard problem is hard because it is difficult to imagine what it would be like not to be conscious. We are always conscious, every second of every waking day of our lives. One way to better understand this question is by using your imagination. Imagine a world where there are human beings, like us, and also another kind of beings. Let us call them **Humanatons**. Humanatons look similar to us in every respect. They live their lives the same way we do. They wake up in the morning, eat their breakfast, play with their friends...but these Humanatons do not feel anything. They have no conscious experiences. They would not feel tired, nor the pleasure of tasting their cereal, nor the happiness of being with their friends. They would still function properly, they just would not feel themselves working (Figure 3).

In this imaginary world, the Hard Problem could be phrased this way: in comparison, why do we, human beings, feel ourselves living? Why not live our life like these Humanatons, if they are as good as we are at living their lives without any sensory experiences or any feelings? Do human beings have something more by having a conscious experience, beside the experience itself? Researchers are having trouble answering all these questions.

Figure 3

On the **left**, a human is having a conscious experience of happiness. On the **right**, a completely made up being called a Humanaton is smiling, but it does not feel happy. It does not feel unhappy, either. For example, if a Humanaton pinched its finger in a door, it would cry because Humanatons act like human beings, but it would not feel any pain. This kind of imaginary scenario can help researchers to think about important questions, like why humans have conscious experiences.

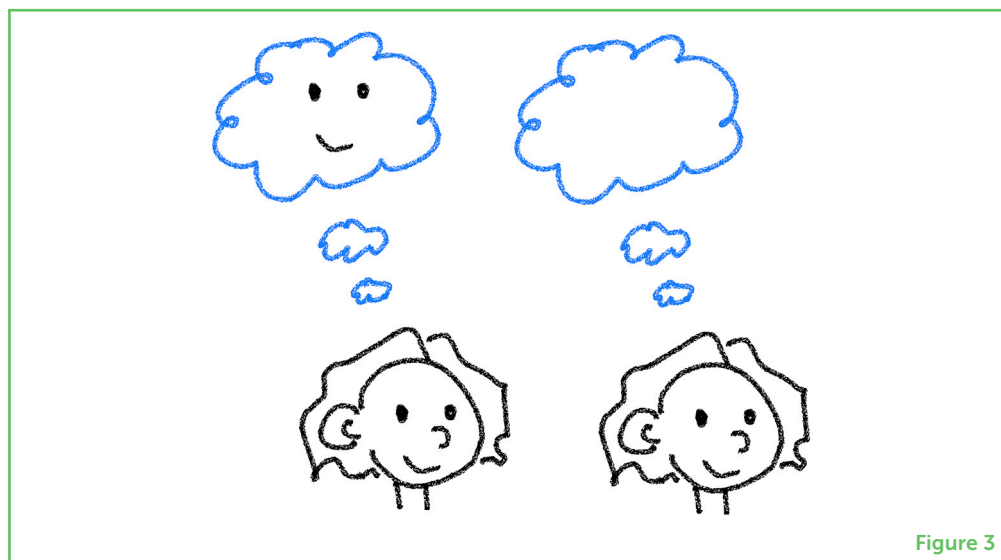


Figure 3

ONE POSSIBLE ANSWER

Scientists currently have several answers to the Hard Problem, but not every specialist agrees on one answer. We will now talk a little bit about our favorite answer: we say that, even in this imaginary world, Humanatons could not exist. Conscious experiences may have a function—they may motivate you [4]. The pleasure you feel eating the strawberry could motivate you to eat it. What would be the point of doing anything if doing it did not make you feel something? Why would you eat the strawberry if it were not for its taste or to stop being hungry? The answer is that you probably would not eat it. Actually, you would not do anything at all without your conscious experience.

To put it another way, the more you enjoy having an experience, the more you will try to replicate it; the less you enjoy it, the more you will try to avoid it. Our lead to the Hard Problem suggests that conscious experiences give us the feeling of having little goals all the time. The reason we do things would be that we feel good when we achieve them, and bad when we do not.

WHAT GOOD IS CONSCIOUSNESS RESEARCH?

You now know what consciousness is, how researchers study it, and that an unanswered question is “why do we have it?” This research may seem quite pointless to you. Why bother studying something that is both obvious to everyone and very hard to measure?

Well, as you read, a lot of beings cannot talk, and therefore they cannot communicate their needs to us. We then must assume what they feel based on indirect clues only. If a dog wags its tail, we have good reasons to trust that it is happy. But we may be wrong because we do not communicate the same way dogs do.

If a being (whatever it may be) is conscious, then it may be able to feel pain, sadness, or other negative feelings. And no one enjoys feeling pain or sadness. Thus, we should protect conscious beings from these negative feelings. To do so, we can write laws. For instance, it is forbidden to beat pets because we assume that they can feel pain. In comparison, there is no such law preventing us from beating a table. The reason is that we do not think a table is capable of feeling pain. Laws protect beings as long as we think they can feel, which means have a conscious experience. We are on a path toward treating animals differently in terms of their rights as conscious beings. That is a very important goal, and a good reason to want a better understanding of conscious experiences.

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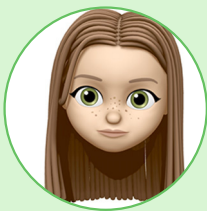
LEXI, AGE: 12

My name is Lexi and I am 12 years old. I like microbiology, macro photography, and cats. My plan is to become a microbiologist in research.



MISCHA, AGE: 11

Hi everyone! My name is Mischa. I love playing soccer, drawing, listening to music, watching The Simpsons and I also really enjoy reading! At school, my favorite subjects are sport, math, science, English and geography. I live near a beach and I am a "nipper", which means that every summer I practice swimming and paddling on a rescue board in the surf, for the local life saving club.



NOVA, AGE: 12

Hi, I am Nova! I am twelve and I love astrobiology and philosophy! My favorite book series is Keeper of the Lost Cities by Shannon Messenger, and I am a violinist and singer! I also love writing short stories and I am in the middle of writing a novel!

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Originally from Paul Sabatier University (Toulouse, France), Yanis is currently finishing his master's thesis at the Centre for Research in Cognition and Neurosciences in Brussels, under the supervision of Axel Cleeremans. He is studying the influence of our beliefs on our body. In the future, he is eager to continue working with Axel, as he wants to pursue the scientific journey that is the study of consciousness and perhaps answer the question: is there something more than that? [*yanis.mouheb@univ-tlse3.fr](mailto:yanis.mouheb@univ-tlse3.fr)



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