



Observations

Do We Actually Experience the Flow of Time?^[SEP]

Subjective experience must inform physics and philosophy, but it should be assessed carefully

By Bernardo Kastrup on November 14, 2018

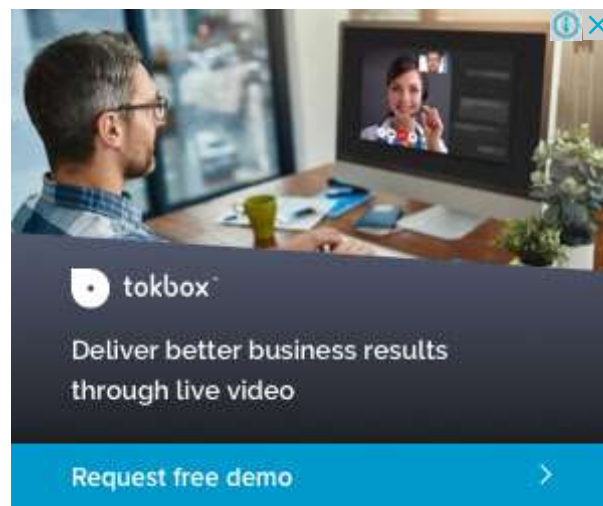


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Time is a contentious topic in physics. Some physicists, such as Julian Barbour, argue that it doesn't even exist. Others, such as Carlo Rovelli, hold that it arises as a secondary effect of deeper quantum processes. Yet others, such as Lee Smolin, maintain that time is the sole fundamental dimension of nature. And because the laws of physics are time-symmetrical, much debate has gone into figuring out why we seem unable to travel back in time.

All this theorizing is motivated by—and attempts to make sense of—our subjective experience of the forward flow of time. Indeed, our reliance on what we *think* we experience as the flow of time goes so deep that some philosophers take it for a self-evident axiom. For instance, writing for this magazine, Susan Schneider claimed that the flow of time is inherent to experience—so much so that, according to her, “timeless experience is an oxymoron.”

But do we actually *experience* the flow of time? We certainly experience something that looks like it. But if we introspect carefully into this experience, is what we find accurately describable as “flow”?



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There can only be experiential flow if there is experience in the past, present *and* future. But where is the past? Is it anywhere out there? Can you point at it? Clearly not. What makes you conceive of the idea of the past is the fact that you have memories. But these memories can only be referenced insofar as they are experienced now, as memories. There has never been a single point in your entire life in which the past has been anything other than memories experienced in the present.

The same applies to the future: where is it? Can you point at it and say “there is the future”? Clearly not. Our conception of the future arises from expectations or imaginings experienced *now*, always now, as expectations or imaginings. There has never been a single point in your life in which the future has been anything other than expectations or imaginings experienced in the present.

But if the past and the future are not actually experienced in the, well, past and future, how can there be an experiential flow of time? Where is experiential time flowing from and into?

Let’s make an analogy with space. Suppose that you suddenly find yourself sitting on the side of a long, straight desert road. Looking ahead, you see mountains in the distance. Looking behind, you see a dry valley. The mountains and the valley provide references that allow you to locate yourself in space. But the mountains, the valley, your sitting on the roadside, all exist simultaneously in the present snapshot of your conscious life.

An entirely analogous situation occurs in time: right now, you find yourself reading this essay. As you read it, you can remember having done something else—say, having brushed your teeth—earlier today. You can also imagine that you will do something else later—say, lie down in bed. Brushing your teeth and lying down in bed are respectively behind and ahead of you on the road of time—your “timescape”—just as the valley and the mountains were on the road of space. They provide references that allow you to locate yourself in time. But again, the experiences of remembering the past and imagining the future, as well as that of reading this essay right now, all exist simultaneously in the present snapshot of your conscious life.

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The problem is that we then construe from this that there is an experiential flow of time. Such a conclusion is as unjustifiable as to construe, purely from seeing the mountains ahead and the valley behind while you sit by the roadside, that you are moving on the road. You aren't; you are simply taking account of your relative position on it. You have no more experiential reason to believe that time flows than that space flows while you sit quietly by the roadside.

You may claim that, whereas the desert road scenario is static, lacking action, you actually did brush your teeth earlier. So time definitely flowed from then to now; or did it? All you have supporting belief that it did is your memory of having brushed your teeth, which you experience now. All you ever have is the present experiential snapshot. Even the notion of a previous or subsequent snapshot is—insofar as you can know from experience—merely a memory or expectation *within the present snapshot*. The flow from snapshot to snapshot is a story you tell yourself, irresistibly compelling as it may be. Neuroscience itself suggests that this flow is indeed a cognitive construct.

A thought experiment may help: suppose that you could return to your past—say, back to the moment when you were brushing your teeth this morning. In the corresponding experiential snapshot, the present would lie between, say, the memory of your having stood up from bed and the expectation of your dressing up for work. But once you landed on that snapshot, you would have no experience of any temporal discontinuity: you would look behind in memory and see yourself standing up from bed; you would look ahead in imagination and see yourself dressing up for work. The tape of history would have been rewound and you would have no memory of having time-traveled; otherwise you wouldn't have actually time-traveled. Everything would feel perfectly normal—*just as it feels right now*. So who is to say that you haven't time-traveled a moment ago? How do you know that time always flows forward?



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You see, whether time flows forward, or doesn't flow at all, or moves back and forth, our resulting subjective experience would be identical in all cases: we would always find ourselves in an experiential snapshot extending smoothly backwards in memory and forwards in expectation, just like the desert road. We would always tell ourselves the same story about what's going on. A mere cognitive narrative—based purely on contents of the experiential snapshot in question—would suffice to convince us of the forward flow of time *even when such is not the case*.

The ostensible experience of temporal flow is thus an illusion. All we ever actually experience is the present snapshot, which entails a timescape of memories and imaginings analogous to the landscape of valley and mountains. Everything else is a story. The implications of this realization for physics and philosophy are profound. Indeed, the relationship between time, experience and the nature of reality is liable to be very different from what we currently assume, as I discuss in my upcoming book, *The Idea of the World*. To advance our understanding of reality we must thus revise cherished assumptions about our experience of time.