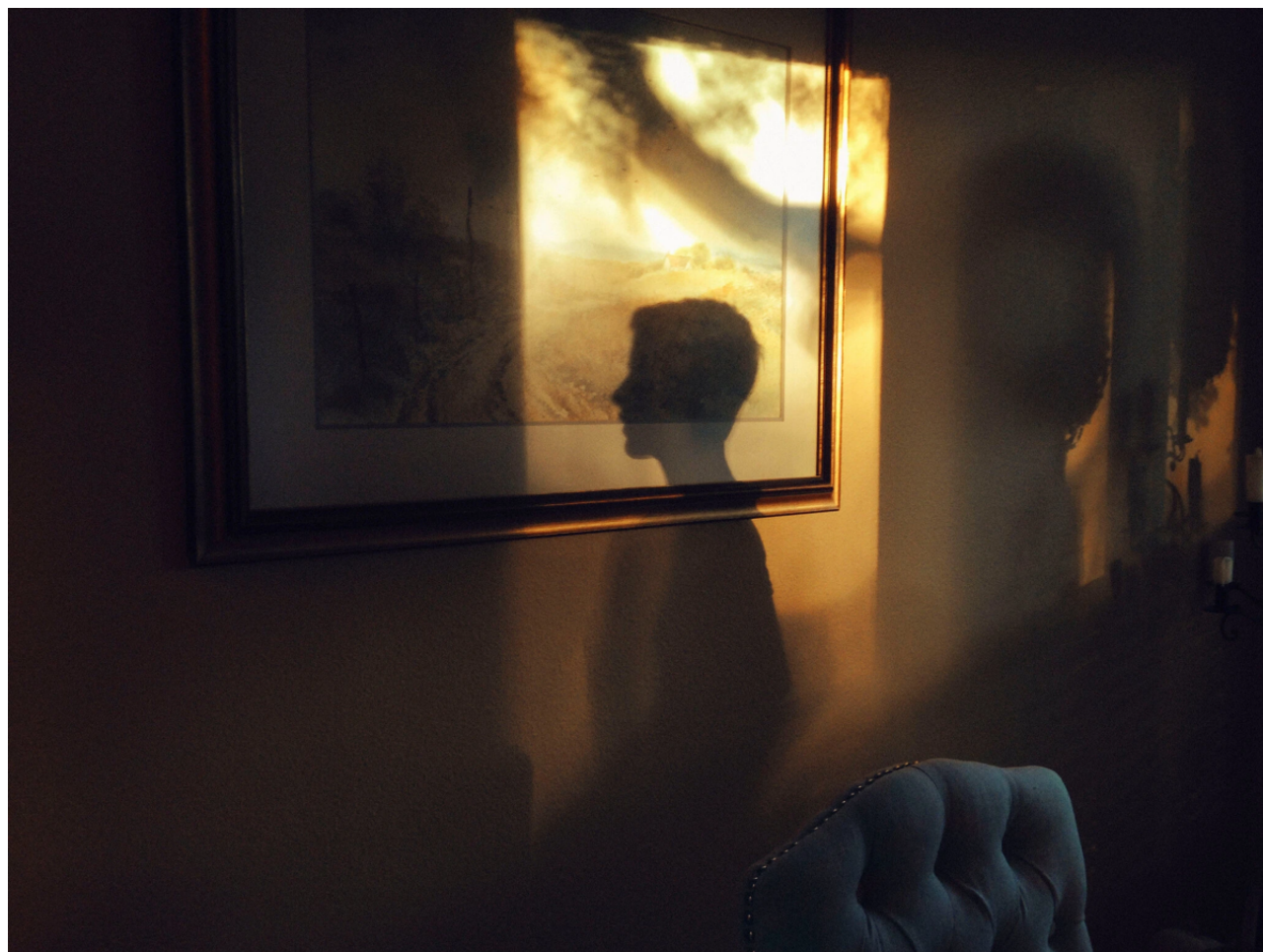


You Are Not Who You Think You Are

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Christopher Anderson/Magnum Photos

You may think you understand the difference between seeing something and imagining it. When you see something, it's really there; when you imagine it, you make it up. That feels very different.

The problem is that when researchers ask people to [imagine something](#), like a tomato, and then give some of them a just barely visible image of a tomato, they find that the process of imagining it is hard to totally separate from the process of seeing it. In fact, they use a lot of the same brain areas.

And when you stop to think about it, that makes some sense. Your brain is locked in the pitch-black bony vault of your skull, trying to use scraps of information to piece together the world. Even when it's seeing, it's partly constructing what's out there based on experience. "It turns out, reality and imagination are completely intermixed in our brain," Nadine Dijkstra [writes in Nautilus](#), "which means that the separation between our inner world and the outside world is not as clear as we might like to think."

We grew up believing that "imagining" and "seeing" describe different mental faculties. But as we learn more about what's going on in the mind, these concepts get really blurry really fast.

This is happening all over the place. Over the centuries, humans have come up with all sorts of concepts to describe different thinking activities: memory, perception, emotion, attention, decision-making. But now, as scientists develop greater abilities to look at the brain doing its thing, they often find that the activity they observe does not fit the neat categories our culture has created, and which we rely on to understand ourselves.

Let me give you a few more examples:

Reason/Emotion. It feels as if the rational brain creates and works with ideas, but that emotions sweep over us. But some neuroscientists, like Lisa Feldman Barrett of Northeastern University, argue that people construct emotions and thoughts, and there is no clear distinction between them. It feels as if we can use our faculty of reason to restrain our passions, but some neuroscientists doubt this is really what's happening. Furthermore, emotions assign value to things, so they are instrumental to reason, not separate from or opposed to it.

Observation/Memory. Observation feels like a transparent process. You open your eyes and take stuff in. In fact, much or most of seeing is making

mental predictions about what you expect to see, based on experience, and then using sensory input to check and adjust your predictions. Thus, your memory profoundly influences what you see. "Perceptions come from the inside out just as much, if not more, than from the outside in," the University of Sussex neuroscientist Anil Seth has [observed](#). The conversation between senses and memory produces what he calls a "controlled hallucination," which is the closest we can get to registering reality.

Understanding/Experiencing. Understanding seems cognitive; you study something and figure it out. Experience seems sensory; you physically live through some event. But Mark Johnson, now a professor emeritus in the University of Oregon's Department of Philosophy, [points out](#) that there is no such thing as disembodied understanding. Your neural, chemical and bodily responses are in continual conversation with one another, so both understanding and experiencing are mental and physical simultaneously. "When faced with a whole person," Joe Gough, a Ph.D. student in philosophy at the University of Sussex, [writes](#), "we shouldn't think that they can be divided into a 'mind' and a 'body.'"

Self-control. We talk as if there's a thing called self-control, or self-regulation, or grit. But the Stanford psychology professor Russell Poldrack tells me that when you give people games to measure self-control in a lab, the results do not predict whether they will be able to resist alcohol or drug use in the real world. This suggests, Poldrack says, that what we believe is "self-control" may really be a bunch of different processes.

Jordana Cepelewicz recently had an [excellent essay](#) on this broad conceptual challenge in Quanta Magazine. "You realize that neither the term 'decision-making' nor the term 'attention' actually corresponds to a thing in the brain," the University of Montreal neuroscientist Paul Cisek told her. She also reported that some in the field believe that the concepts at the core of

how we think about thinking need to be radically revised.

That seems exciting. I've long wondered if in 50 years terms like "emotion" or "reason" will be obsolete. Some future genius will have come up with an integrative paradigm that more accurately captures who we are and how we think.

I love how holistic the drift of research is. For a while, neuroscientists spent a lot of time trying to figure out what region of the brain did what function. (Fear is in the amygdala!) Today they also look at the ways vast networks across the brain, body and environment work together to create comprehensive mental states. Now there is much more emphasis on how people and groups creatively construct their own realities, and live within their own constructions.

I've often told young people to study genetics. That will clearly be important. But I'm realizing we all need to study this stuff, too. Big, exciting changes are afoot.

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