

Is the world real, or is it just an illusion or hallucination?

HF hopesandfears.com/hopes/now/question/216693-is-reality-real

10/15/2015

Is this real life? How do we know that we are not hallucinating it all? What if we're plugged into a *Matrix*-style virtual reality simulator? Isn't the universe a [giant hologram](#) anyway? Is reality *really* real? What *is* reality?

We asked renowned neuroscientists, physicists, psychologists, technology theorists and hallucinogen researchers if we can ever tell whether the "reality" we are experiencing is "real" or not. Don't worry. You're going to be ok.

Jessica L. Nielson, Ph.D.

Department of *Neurosurgery*, Postdoctoral Scholar, University of California, San Francisco (UCSF), Brain and Spinal Injury Center (BASIC)

What is our metric for determining what is real? That is probably different for each person. One could try and find a consensus state that most people would agree is "real" or a "hallucination" but from the recent literature using imaging techniques in people who are having a hallucinatory experience on psychedelics, it seems the brain is hyper-connected and perhaps just letting in more of the perceivable spectrum of reality.

When it comes to psychosis, things like auditory hallucinations can seem very real. Ultimately, our experiences are an interpretation of a set of electrical signals in our brains. We do the best to condense all those signals into what we perceive to be the world around us (and within us), but who is to say that the auditory hallucinations that schizophrenics experience, or the amazing visual landscapes seen on psychedelics are not some kind of bleed through between different forms of reality? I don't think there is enough data to either confirm or deny whether what those people are experiencing is "real" or not.

Sean Carroll

Cosmologist and Physics professor specializing in *dark energy and general relativity*, research professor in the Department of Physics at the California Institute of Technology

How do we know this is real life? The short answer is: we don't. We can never prove that we're not all hallucinating, or simply living in a computer simulation. But that doesn't mean that we believe that we are.

There are two aspects to the question. The first is, "How do we know that the stuff we see around us is the real stuff of which the universe is made?" That's the worry about the holographic principle, for example -- maybe the three-dimensional space we seem to live in is actually a projection of some underlying two-dimensional reality.

The answer to that is that the world we see with our senses is certainly *not* the "fundamental" world, whatever that is. In quantum mechanics, for example, we describe the world using wave functions, not objects and forces and spacetime. The world we see *emerges* out of some underlying description that might look completely different.

The good news is: that's okay. It doesn't mean that the world we see is an "illusion," any more than the air around us becomes an illusion when we first realize that it's made of atoms and molecules. Just because there is an underlying reality doesn't disqualify the immediate reality from being "real." In that sense, it just doesn't matter whether the world is, for example, a hologram; our evident world is still just as real.

The other aspect is, "How do we know we're not being completely fooled?" In other words, forgetting about whether

there is a deeper level of reality, how do we know whether the world we see represents reality at all? How do we know, for example, that our memories of the past are accurate? Maybe we are just brains living in vats, or maybe the whole universe was created last Thursday.

We can never rule out such scenarios on the basis of experimental science. They are conceivably true! But so what? Believing in them doesn't help us understand any features of our universe, and puts us in a position where we have no right to rely on anything that we did think is true. There is, in short, no actual evidence for any of these hyper-skeptical scenarios. In that case, there's not too much reason to worry about them.

The smart thing to do is to take reality as basically real, and work hard to develop the best scientific theories we can muster in order to describe it.

Holographic Principle

“If you asked anyone twenty years ago how many dimensions our world has, most of us would answer 'three spatial dimensions plus time.' The holographic principle would mean that this is actually a matter of perspective.”
Craig Hogan to [Motherboard](#)

The **theory** suggests that the entire universe can be seen as a two dimensional information on the cosmological horizon, such that the three dimensions we observe are an effective description only at macroscopic scales and at low energies.

The Nature of Space and Time: *Is Space Digital?*

Space may not be smooth and continuous. Instead it may be digital, composed of tiny bits. Physicists have assumed that these bits are far too small to measure with current technology. Yet one scientist... [Scientific American](#), 2014

Fredrick Barrett

Instructor in Psychiatry and Behavioral Sciences, *Behavioral Pharmacology Research Unit*, Johns Hopkins School of Medicine

With psychedelics or "classical (serotonergic) hallucinogens", individuals can often distinguish between perceptual disturbances, visualized experiences (it feels as if I was in another place, or I had traveled to another time, but I realized my physical body was still "here"), and whatever is happening "outside" in the "real" world. However, in psychosis (for instance, in the midst of a psychotic break in a person who has schizophrenia), hallucinations are quite clearly defined as something that an individual believes is real, persistent, and seemingly independent and autonomous in the world.

The "hallucinations" of schizophrenia and psychosis are accepted as real, and individuals with schizophrenia often do not have insight into the nature of their hallucinations as being "not real" to the rest of us. This highlights a bit of a misnomer in the name of the drug class "hallucinogens", in that the experiences with these compounds are not taken as consensual reality in the same way that psychotic hallucinations are taken as "real".

How or Why can we tell the difference between reality and what is perceived during the acute effects of psychedelics? I'm not sure science has definitively answered that question ... but I think it may have to do with access to the insight that you've consumed a substance that can have these effects. It also may have to do with the transient effect of many perceptual disturbances and visualizations that can occur with hallucinogens. Maybe if the subjective effects of hallucinogens acted more like every-day perceptions (i.e. they weren't so extraordinary) or if they were more fixed or persistent (i.e. they didn't shift, warp, or morph so often) they would seem more real to the individual experiencing them.

George Musser Jr

Contributing editor for *Scientific American* magazine, Knight Science Journalism Fellow at MIT 2014–2015, author of [The Complete Idiot's Guide to String Theory](#) and [Spooky Action at a Distance: The Phenomenon That Reimagines Space and Time--and What It Means for Black Holes, the Big Bang, and Theories of Everything](#)

The holographic principle doesn't mean the universe isn't real. It just means that the universe around us, existing within spacetime, is **constructed** out of more fundamental building blocks. "Real" is sometimes taken to mean "fundamental", but that's a very limited sense of the term. Life isn't fundamental, since living things are made from particles, but that doesn't make it any less real. It's a higher-level phenomenon. So is spacetime, if the holographic principle is right. I talk about the holographic principle at length in my book, and I discuss the distinction between fundamental and higher-level phenomena in a [recent blog post](#).

The closest we come in science to "real" or "objective" is intersubjective agreement. If a large number of people agree that something is real, we can assume that it is. In physics, we say that something is an objective feature of nature if all observers will agree on it - in other words, if that thing doesn't depend on our arbitrary labels or the vagaries of a given vantage point ("frame-independent" or "gauge-invariant", in the jargon). For instance, I'm not entitled to say that my kitchen has a left side and a right side, since the labels "left" and "right" depend on my vantage point; they are words that describe me more than the kitchen. This kind of reasoning is the heart of Einstein's theory of relativity and the theories it inspired.

Could we all be fooled? Yes, of course. But there's a practical argument for taking intersubjective agreement as the basis of reality. Even if everyone is being fooled, we still need to explain our impressions. An illusion, after all, is entirely real - it is the **interpretation** of the illusion that can lead us astray. If I see a smooth blue patch in the desert, I might misinterpret the blue patch as an oasis, but that doesn't mean my impression isn't real. I'm seeing something real - not an oasis, but a refracted image of the sky. So, even if we're all just projections of a computer simulation, like *The Matrix*, the simulation itself has a structure that gives it a kind of reality, and it is **our** reality, the one we need to be able to navigate. (The philosopher Robert Nozick had a famous argument along these lines.)

Karl Friston

Institute of *Neurology*, University College London, Wellcome Principal Research Fellow and Scientific Director, Fellow of the Royal Society

First, you pose an extremely interesting question about how do we know we are hallucinating. Strictly speaking, one never has insight into a true hallucination, if one does, these are generally referred to as pseudo-hallucinations, which are not unrelated to illusions. The very distinction between illusions and hallucinations is itself fascinating. This is because it suggests we have the capacity to represent our own representations – or representational validity. This speaks to all sorts of deep philosophical issues; for example, auto epistemic closure (in the sense of Thomas Metzinger), metacognition, self-awareness, lucid dreaming and so on.

The very fact that we can infer are perceptual influences are false speaks to a hierarchical composition of mind and perception; in which not only do we have perceptual influences but also inferences about those inferences (CF metacognition). The implications for self awareness are clear. This is why people like Allan Hobson are so fascinated by lucid dreaming. This provides a wonderful test bed to compare situations in which dream reality is perceived as real and when one becomes aware of the fact that it is a dream. Neurobiologically, this seems to rest on frontal lobe activity, suggesting, again, a hierarchical aspect to our fantastic organ (i.e. the brain – that generates fantasies that are checked against reality).

The usual notion that perception is just hallucination grounded by sensations is somewhat subverted by the fact that we can, on occasions, know that our perceptual inference is false.

Metacognition is "cognition about cognition", "thinking about thinking", or "knowing about knowing". It comes from the root word "meta", meaning beyond.

Self-awareness is the capacity for introspection and the ability to recognize oneself as an individual separate from the environment and other individuals.

A lucid dream is any dream in which one is aware that one is dreaming.

Epistemic closure is a property of some belief systems. It is the principle that if a subject S knows p , and S knows that p entails q , then S can thereby come to know q . Most epistemological theories involve a closure principle and many skeptical arguments assume a closure principle.

Autoepistemic closure (Thomas Metzinger) is an epistemological, and not (at least not primarily) a phenomenological concept. It refers to an "inbuilt blind spot," a structurally anchored deficit in the capacity to gain knowledge about oneself.

Rich Oglesby

Creator and editor of *Prosthetic Knowledge*

There is a well known phrase: "We shape our tools and thereafter our tools shape us" (often associated with media theorist Marshall McLuhan, although it was actually a quote from Father John Culkin, a Professor of Communication at Fordham University in New York). This makes sense from an anthropological perspective - to put it crudely, whilst early humans evolved the ability to speak, the controlled sounds and utterances gained meaning to each other through localized consensus. Fast forward to the twentieth century and industrial nations, one can discover technologies that we can recognize their purpose yet have differences to our own, depending on our cultures and others - for example, the differences with electrical sockets or which side of the road you drive from one country to another. This was noted in William Gibson's book *Pattern Recognition* which he labelled 'mirror-world'. Technology also can become taken for granted and familiar over time unless we find ourselves taken out of our habituated situation - nothing so easily reminds ourselves of change as a power cut, taking us back a couple of centuries.

In the past twenty years or so in the industrial world, the biggest impact on our experiences has been from the field of computing. While many focus on the internet as the biggest game changer, it neglects developments and permutations which other computing tech has reached - how the computer monitor tech has crossed over into television displays, graphics cards have altered how we work with colours transforming Pantone, photography and printing, sound cards and music sequencers, mp3 and Flac. Personal computing technologies have radically changed the way we make, define and experience the world we exist in. To describe the last twenty years, the best term I can think of is the *Recon-Naissance*, combining the terms *reconnaissance* (the practise of gathering, formulating or expressing information) and *renaissance* (both 'rebirth' and revival of interest), it is the widespread outcome of ideas and production of post-WW2 investment in computational and telecommunication technologies. The *Renaissance Man* polymath has been replaced with the *Renaissance Machine* - the personal computer. The same PC could be used by scientist or businessperson, coder or student, in the office or in the warehouse, in the studio or in the bedroom. This has been most advantageous to the modern creative.

With the development of the smartphone ten years ago, modern computing became pocketable. With it, computing components became smaller. Due to commercial popularity, upgrade cycles changed from a year and a half to just one. Information creation and reception became domesticated. It became mainstream and more conveniently portable. Music, photography and video could be captured and seen on the same device, replacing the personal media player and the portable camera. Life could be documented and experienced 'en plein Hertz'.

But the developments of the smartphone benefitted a once neglected but now up-and-coming field: Virtual Reality. With small displays and accelerometers now refined and cheaper, and gave the opportunity to start ups to produce a new experiences with a new computing medium. Initially produced to complement video games, other startups are

producing other narratives, such as 360 documentaries, animations and first person tools for creativity and design. Whilst the consumer implementation of these ideas are not truly available yet, the technology is being used by scientists, architects, artists and gamers with current developer builds. It would appear how we engage and relate with information will change again - the Recon-Naissance is still going strong.

Brad Burge

Director of Communications and Marketing: [MAPS](#), Multidisciplinary Association for Psychedelic Studies

These aren't really scientific questions per se though they are fascinating and valuable to think about. I think it comes down to our definitions of both "hallucination" and "reality"—to what extent is any experience we have really "real"? That may be one the main things that hallucinations teach us, regardless of whether they're caused by drugs, neurological conditions, or intense meditation: to trust in our own experience, while always remembering that our experience is always our own.