

Did Humans Evolve to See Things as They Really Are?

Do we perceive reality as it is?

By [Michael Shermer](#) on November 1, 2015

One of the deepest problems in epistemology is how we know the nature of reality. Over the millennia philosophers have offered many theories, from solipsism (only one's mind is known to exist) to the theory that natural selection shaped our senses to give us an accurate, or veridical, model of the world. Now a new theory by University of California, Irvine, cognitive scientist Donald Hoffman is garnering attention. (Google his scholarly papers and TED talk with more than 1.4 million views.) Grounded in evolutionary psychology, it is called the interface theory of perception (ITP) and argues that percepts act as a species-specific user interface that directs behavior toward survival and reproduction, not truth.

Hoffman's computer analogy is that physical space is like the desktop and that objects in it are like desktop icons, which are produced by the graphical user interface (GUI). Our senses, he says, form a biological user interface—a gooey GUI—between our brain and the outside world, transducing physical stimuli such as photons of light into neural impulses processed by the visual cortex as things in the environment. GUIs are useful because you don't need to know what is inside computers and brains. You just need to know how to interact with the interface well enough to accomplish your task. Adaptive function, not veridical perception, is what is important.

Hoffman's holotype is the Australian jewel beetle *Julodimorpha bakewelli*. Females are large, shiny, brown and dimpled. So, too, are discarded beer bottles dubbed “stubbies,” and males will mount them until they die by heat, starvation or ants. The species was on the brink of extinction because its senses and brain were designed by natural selection not to perceive reality (it's a beer bottle, you idiot!) but to mate with anything big, brown, shiny and dimply.

To test his theory, Hoffman ran thousands of evolutionary computer simulations in which digital organisms whose perceptual systems are tuned exclusively for truth are outcompeted by those tuned solely for fitness. Because natural selection depends only on expected fitness, evolution shaped our sensory systems toward fitter behavior, not truthful representation.

ITP is well worth serious consideration and testing, but I have my doubts. First, how could a more accurate perception of reality not be adaptive? Hoffman's answer is that

evolution gave us an interface to hide the underlying reality because, for example, you don't need to know how neurons create images of snakes; you just need to jump out of the way of the snake icon. But how did the icon come to look like a snake in the first place? Natural selection. And why did some nonpoisonous snakes evolve to mimic poisonous species? Because predators avoid real poisonous snakes. Mimicry works only if there is an objective reality to mimic.

Hoffman has claimed that “a rock is an interface icon, not a constituent of objective reality.” But a real rock chipped into an arrow point and thrown at a four-legged meal works even if you don't know physics and calculus. Is that not veridical perception with adaptive significance?

As for jewel beetles, stubbies are what ethologists call supernormal stimuli, which mimic objects that organisms evolved to respond to and elicit a stronger response in doing so, such as (for some people) silicone breast implants in women and testosterone-enhanced bodybuilding in men. Supernormal stimuli operate only because evolution designed us to respond to normal stimuli, which must be accurately portrayed by our senses to our brain to work.

Hoffman says that perception is species-specific and that we should take predators seriously but not literally. Yes, a dolphin's icon for “shark” no doubt looks different than a human's, but there really are sharks, and they really do have powerful tails on one end and a mouthful of teeth on the other end, and that is true no matter how your sensory system works.

Also, computer simulations are useful for modeling how evolution might have happened, but a real-world test of ITP would be to determine if most biological sensory interfaces create icons that resemble reality or distort it. I'm betting on reality. Data will tell.

Finally, why present this problem as an either-or choice between fitness and truth? Adaptations depend in large part on a relatively accurate model of reality. The fact that science progresses toward, say, eradicating diseases and landing spacecraft on Mars must mean that our perceptions of reality are growing ever closer to the truth, even if it is with a small “t.”