

What Constitutes Compelling Evidence and for Whom?

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“Exceptional claims require exceptional evidence”

- What constitutes an exceptional claim, merely one that is not widely accepted?
- But widely accepted by whom?
- What constitutes exceptional evidence?
- Does it need to be physical evidence, or might it be first-person, subjective evidence?
- In today’s world, the notion that science is the sole arbiter of truth is highly questionable.

The Scientific Ideal of Skepticism

Michael Shermer (Executive Director of the Skeptics Society):

“Skepticism is . . . the application of reason to any and all ideas—no sacred cows allowed. In other words . . . skeptics do not go into an investigation closed to the possibility that a phenomenon might be real or that a claim might be true. When we say we are ‘skeptical,’ we mean that we must see compelling evidence before we believe.

A Very Exceptional Claim

Psychologist B. F. Skinner (1904–1990):

“To agree that what one feels or introspectively observes are conditions of one’s own body is a step in the right direction. It is a step toward an analysis both of seeing and of seeing that one sees in purely physical terms. After substituting brain for mind, we can then move on to substituting person for brain and recast the analysis in line with the observed facts. *But what is felt or introspectively observed is not an important part of the physiology which fills the temporal gap in a historical analysis.*”

A Skeptic's Response

Christof Koch, Chief Scientific Officer at the Allen Institute for Brain Science:

- “The dirty secret is that we don’t even understand the nematode *C. Elegans*, which only has 302 neurons [in contrast with the nearly 100 billion in the human brain]. We don’t have a complete model of this tiny organism.”
- “Are [the mind and brain] really one and the same thing, viewed from different perspectives? The characters of brain states and of phenomenal states [of subjective experience] appear too different to be completely reducible to each other.”

Another Exceptional Claim

Philosopher John R. Searle:

- “There is a simple solution to the mind-body problem, and This solution has been available to any educated person since serious work began on the brain nearly a century ago, and, in a sense, we all know it to be true. Here it is: Mental phenomena are caused by neuro-physiological processes in the brain and are themselves features of the brain.”
- Mental phenomena emerge solely from the brain, much as bile is secreted from the gall bladder.

Skeptics' Responses

- Biologist Thomas H. Huxley (1825–1895): “How it is that anything so remarkable as a state of consciousness comes about as a result of irritating nervous tissue, is just as unaccountable as the appearance of the Djinn, when Aladdin rubbed his lamp.” [*The Elements of Physiology and Hygiene: A Text-book for Educational Institutions*. D. Appleton, 1869, p. 178]
- Neuroscientist Giulio Tononi: “How could mere matter generate mind?” This is a mystery “stranger than immaculate conception... an impossibility that defies belief.” [*Phi: A Voyage from the Brain to the Soul* (2012)]
- There is, in fact, no empirical evidence that proves consciousness is produced solely by the activation of neurons.
- The necessary causes and conditions for generating consciousness are unknown to science.
- Since consciousness itself is physically undetectable, its principal cause may also be physically undetectable.

Another Skeptic's Response

- Neuroscientist Donald Hoffman: “Now, Huxley knew that brain activity and conscious experiences are correlated, but he didn't know why. To the science of his day, it was a mystery. In the years since Huxley, science has learned a lot about brain activity, but the relationship between brain activity and conscious experiences is still a mystery.”
- All known functions of physical entities are themselves physical and therefore exhibit physical qualities that can be objectively measured.
- Mental phenomena display no physical qualities and cannot be objectively measured.

One More Exceptional Claim

Christof Koch:

“Any complex system, as defined below, has the basic attributes of mind and has a minimal amount of consciousness in the sense that it feels like *something* to be that system. If the system falls apart, consciousness ceases to be; it doesn't feel like anything to be a broken system. And the more complex the system, the larger the repertoire of conscious states it can experience.” [<http://www.scientificamerican.com/article/is-consciousness-universal/>]

A Skeptic's Response

- There is no empirical evidence to support the belief that any system that has even one bit of integrated information has a very minute conscious experience.
- No distinction is made in this theory between quantitative and qualitative information, where the former is defined as the pattern of organization of matter and energy, and the latter as some pattern of organization and matter and energy given meaning by a living being (or its constituent parts). [Bates, Marcia “Fundamental Forms of Information” *Journal of the American Society for Information and Technology* [Volume 57, Issue 8], pp. 1033–1045, June 2006].]
- The hypothesis that every complex system of integrated information is conscious implies that the Internet is conscious, but this, like this theory as a whole, is completely speculative, as acknowledged by Dr. Koch.
- There is no cogent theory that explains how the minds of individual complex systems (e.g., amygdale) bind together to form a unified mind of a larger complex system (e.g., a brain).

A Wildly Exceptional Claim

- Philosopher David Chalmers: The hard problem is the sheer fact of our first-person, immediate experience (qualia) and its relation to the brain.
- Physicist Michio Kaku: “There is no such thing as the Hard Problem.” A thermostat has the lowest possible level of consciousness while humans represent the highest level currently known.
- Princeton neuroscientist Michael Graziano: “How does the brain go beyond processing information to become subjectively aware of information? The answer is: It doesn’t... there is no subjective impression; there is only information in a data-processing device.”

A Skeptic's Response

Physicist Adam Frank:

“Thus the essential mystery of our lives — the strange sense of presence to which we're bound till death and that lies at the heart of so much poetry, art and music — is dismissed as a non-problem when it's exactly the problem we can't ignore. If we're to have anything like a final theory of consciousness, we had better be attentive to the complexity of how we experience our being.”

Yet One More Exceptional Claim

Neuropsychiatrist Eric R. Kandel (Nobel Laureate):

“Our understanding of the biology of mental disorders has been slow in coming, but recent advances like these have shown us that mental disorders are biological in nature, that people are not responsible for having schizophrenia or depression, and that individual biology and genetics make significant contributions... The brain is a complex biological organ possessing immense computational capability: it constructs our sensory experience, regulates our thoughts and emotions, and controls our actions. It is responsible not only for relatively simple motor behaviors like running and eating, but also for complex acts that we consider quintessentially human, like thinking, speaking and creating works of art. Looked at from this perspective, our mind is a set of operations carried out by our brain. The same principle of unity applies to mental disorders.”

A Skeptic's Response

- The revolution in pharmacology has given doctors more drugs to use, allowing millions of people to reduce their symptoms. Yet the overall impact of this drug revolution on public health has been mixed, and decades of research on the drugs' mechanism — on serotonin, for example, the target of antidepressant drugs like Prozac— has taught scientists nothing about the causes of mental illness.
- The benefits of antidepressants are now known to be “nonexistent to negligible” in patients with mild, moderate, and even severe depression, and high doses of antidepressants are hardly more effective than low ones. “Antidepressant Drug Effects and Depression Severity: A Patient-Level Meta-analysis” *JAMA*. 2010;303(1):47-53.

The Big Lie

George Orwell (*Nineteen Eight-Four*):

- “Blackwhite”: The habit of impudently claiming that black is white, in contradiction of the plain facts.”
- Doublethink: “To tell deliberate lies while genuinely believing in them, to forget any fact that has become inconvenient, and then when it becomes necessary again, to draw it back from oblivion for just so long as it is needed.”
- “*Crimestop* means the faculty of stopping short, as though by instinct, at the threshold of any dangerous thought. It includes the power of not grasping analogies, of failing to perceive logical errors...and of being bored or repelled by any train of thought which is capable of leading in a heretical direction. *Crimestop*, in short, means protective stupidity.”

Out with the Old...

Psychoanalyst Sigmund Freud (1856–1939):

“The problem of a world constitution that takes no account of the mental apparatus by which we perceive it is an empty abstraction, of no practical interest...No, our science is not an illusion. What would be an illusion would be to think that we might obtain elsewhere that which science cannot give us.” (*The Future of an Illusion*, 1927)

In with the New

Stanford physicist Andrei Linde (Recipient of the Fundamental Physics Prize, 2012):

“Will it not turn out, with the further development of science, that the study of the universe and the study of consciousness will be inseparably linked, and that ultimate progress in the one will be impossible without progress in the other? After the development of a unified geometrical description of the weak, strong, electromagnetic, and gravitational interactions, will the next important step not be the development of a unified approach to our entire world, including the world of consciousness?”

Exceptional Claims Regarding Compelling Evidence

- Michael Shermer: “Everybody has eyes and ears and a brain that perceives and so on. I think they’re all equally unreliable as eyewitnesses. We’re very bad at recounting things we think we saw.
- Neil deGrasse Tyson, director of the Hayden Planetarium: “As a scientist, I need something better than your eyewitness testimony. Because even if in the court of law eyewitness testimony is a high form of evidence, in the court of science it is the *lowest* form of evidence you could possibly put forth.”
- Psychologist Anne Treisman: Perception is a kind of externally guided hallucination. We create experience rather than “photographing it.”

A Skeptic's Response

- In terms of perception, if humans are all equally unreliable as eyewitnesses, then the whole of science is unreliable, for it is based on the observations of humans.
- Since all scientific observations are based on eyewitness reports of data, if this is the *lowest* possible form of evidence, then science is the lowest form of knowledge of reality.
- If perception is a kind of externally guided hallucination, then the perceptions of psychologists are as dubious as those of everyone else. The conclusion that perception is unreliable is itself based on perception, and if this is a hallucination, this conclusion is itself unreliable.

A Final Exceptional Claim

John R. Searle:

“If by ‘introspection’ we mean a special capacity, just like vision only less colorful, that we have to *spect intro*, then it seems to me there is no such capacity. There could not be, because the model of specting intro requires a distinction between the object spected and the specting of it, and we cannot make this distinction for conscious states.”

A Skeptic's Response

Inventor Nikola Tesla (1856-1943)

“From childhood I was compelled to concentrate attention upon myself. This caused me much suffering but, to my present view, it was a blessing in disguise for it taught me to appreciate the inestimable value of introspection in the preservation of life, as well as a means of achievement. The pressure of occupation and the incessant stream of impressions pouring into our consciousness through all the gateways of knowledge make modern existence hazardous in many ways. Most persons are so absorbed in the contemplation of the outside world that they are wholly oblivious to what is passing on within themselves.”

A Return to Empiricism

Psychologist William James (1842–1910):

- “Introspective Observation is what we have to rely on first and foremost and always. The word introspection need hardly be defined—it means, of course, the looking into our own minds and reporting what we there discover. Everyone agrees that we there discover states of consciousness.”
- “Introspection is difficult and fallible; and ... the difficulty is simply that of all observation of whatever kind... The only safeguard is in the final consensus of our farther knowledge about the thing in question, later views correcting earlier ones, until at last the harmony of a consistent system is reached.”

An Empirically-based Claim

- Each human mind emerges from an individual, subtle continuum of consciousness, which precedes the formation of the brain and continues after brain death.
- This deeper dimension of consciousness can be accessed through rigorous meditative training in highly focused attention and introspection.
- By so doing, one can gain access to past-life memories, the validity of which has been rigorously tested by contemplatives.
- There is further supportive scientific evidence in studies of near-death experiences and reports of past-life recall in children.
- For many centuries, Hindu, Buddhist, Taoist, Jewish, Muslim, Christian, and Shamanic contemplatives have made similar claims, not to mention Pythagoras, Socrates, Plato, and Plotinus.

A Skeptic's Response

- Such a claim calls for research involving sophisticated, sustained training in first-person, contemplative methods to complement third-person, scientific methods.
- Such research should examine the broadest possible range of states of consciousness, and be conducted by skeptical, rigorous, open-minded psychologists, neuroscientists, physicists, philosophers, and contemplatives.
- A network of research facilities should be created for training professional contemplatives in collaborative research with scientists and philosophers.

Research Outside the Law

Carl Sagan (*The Demon-Haunted World*):

“At the time of writing there are three claims in the ESP field which, in my opinion, deserve serious study:

- (1) that by thought alone humans can (barely) affect random number generators in computers;
- (2) that people under mild sensory deprivation can receive thoughts or images “projected” at them; and
- (3) that young children sometimes report the details of a previous life, which upon checking turn out to be accurate and which they could not have known about in any other way than reincarnation.”

Open-Minded Science

Physicist Richard Feynman (1918 – 1988):

“It is only through refined measurements and careful experimentation that we can have a wider vision. And then we see unexpected things: we see things that are far from what we would guess—far from what we could have imagined. . . . If science is to progress, what we need is the ability to experiment, honesty in reporting results—the results must be reported without somebody saying what they would like the results to have been . . . One of the ways of stopping science would be only to do experiments in the region where you know the law. But experimenters search most diligently, and with the greatest effort, in exactly those places where it seems most likely that we can prove our theories wrong. In other words we are trying to prove ourselves wrong as quickly as possible, because only in that way can we find progress.”