

Debate over ‘selfish gene’ theory heats up

The concept of the “selfish gene” has been around for more than three decades. First coined by evolutionary biologist Richard Dawkins in his 1976 book, *The Selfish Gene*, the term describes sequences of DNA that spread by forming additional copies of itself within the genome and make no specific contribution to the reproductive success of the organism in which it is found.

This notion became very popular, in large part, because it captured the idea that all living things, including humans, primarily act to maximize the number of their descendants. It also served as an addendum to Darwin’s Theory of Evolution, helping reinforce the validity of the theory of the survival of the fittest.

From the beginning, however, this idea has been questioned by many other scientists, researchers and journalists who scoff at the idea that humans are motivated by their genes and not by their own free will. Now, after David Dobbs wrote about the need to challenge the Selfish Gene Theory, [in aeon magazine](#), new life is being breathed into this decades-long argument.

In the provocatively titled “Die, Selfish Gene, Die,” Dobbs writes about the notion of rapid gene expression—the idea that the genes within any given organism can be re-read or re-expressed to make the organism better suited for survival. Evidence of this theory, Dobbs writes, demands that the scientific community revisit the idea of the selfish gene.

“The selfish gene is one of the most successful science metaphors ever invented. Unfortunately, it’s wrong,” he writes.

Dobbs explains:

For a century, the primary account of evolution has emphasised the gene’s role as architect: a gene creates a trait that either proves advantageous or not, and is thus selected for, changing a species for the better, or not. Thus, a genetic blueprint creates traits and drives evolution.

This gene-centric view, as it is known, is the one you learnt in high school. It’s the one you hear or read of in almost every popular account of how genes create traits and drive evolution. It comes from Gregor Mendel and the work he did with peas in the 1860s. Since then, and especially over the past 50 years, this notion has assumed the weight, solidity, and rootedness of an immovable object.

But a number of biologists argue that we need to replace this gene-centric view with one that more heavily emphasises the role of gene expression — that we need to see the gene less as an architect and more as a member of a collaborative remodelling and maintenance crew.

Almost immediately after Dobbs’s article was published, it was met with some sharp criticism.

“However good Dobbs’s other writing may have been, this is a dire piece: one that is loaded with

misinformation, wrong information, misleading information, and unsupported speculation,” [wrote science writer Jerry Coyne](#). “None of it even comes close to deposing the value of the ‘selfish gene’ metaphor, and I’m not saying that just because I’m friends with Richard Dawkins.

According to Coyne, Dobbs makes several mistakes:

First, he wants to claim that the metaphor of the selfish gene is wrong. Second, he wants to show that it’s wrong because new understanding of gene regulation—how genes turn on and off during development—render the selfish gene metaphor passé. Finally, he claims that a new theory, that of “genetic accommodation,” relegates much of conventional evolutionary theory to the dustbin, for the new theory deposes the centrality of the gene in favor of the centrality of the environment and its non-genetic effects on development.

There were numerous other sharply critical responses to the Dobbs piece. “While I admire Jerry’s take-down of Dobbs, I’m not sure that he (Jerry Coyne) fully appreciates these other criticisms of the selfish gene,” [writes science writer Laurence A. Moran, adding:](#)

I think we should refer to modern evolutionary theory as “modern evolutionary theory” in order to make sure we’re not talking about “Darwinism,” “neo-Darwinism,” or the hardened version of the “Modern Synthesis.” Modern evolutionary theory includes an important role for random genetic drift, Neutral Theory, and population genetics.

We could clarify a lot of discussion if we stopped talking about extending “Darwinism” or extending the Modern Synthesis or proclaiming once again that the selfish gene has died. In fact, the selfish gene has died, it died almost thirty years ago but most people don’t know that. RIP.

Dobbs [responded to the criticism in a post](#) on his own website, admitting that he may have “muddled” the message in his original piece:

Most crucially, I seem to have not made clear that my challenge was less to a technical account of nature than to a metaphor and story used to describe those technicalities. To put it another way: I apparently did not make clear that “Die, Selfish Gene, Die” is a story less about how genetics and evolution work than about the stories we tell about how genetics and evolution work—and, most crucially, about how those stories about nature percolate out beyond academia and into the minds of the lay public.

Dobbs’s article, and the pushback it received, is a good example of how scientific theories are seldom unanimously agreed upon or remain static. But that is not a bad thing. It is the constant challenge that helps drive science forward.

Dobbs writes of his critics, “Despite discord they have engaged under the noble assumption that drives all

the best science and all the best writing: That, absent evidence otherwise, we are all here trying to tell true and constructive stories about a nature gorgeously and maddeningly complicated.”

Additional Resources:

- “[Higher order thinking](#),” Pharyngula
- “[Jerry Coyne Mucks Up and Misreads ‘Die, Selfish Gene, Die’](#),” David Dobbs
- “Adversarial Journalism and The Selfish Gene,” Richard Dawkin
- “[Grandma’s Experiences Leave a Mark on Your Genes](#),” Discover