Reporter David Dobbs revises ‘selfish gene’ coverage under fire

The term “selfish gene” 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. After David Dobbs wrote a critique of the concept earlier this month in *Aeon* magazine that stoked a firestorm of his own making, the science writer revisited his article, putting the theory and the role of science writing in public discourse under healthy scrutiny.

The notion of the “selfish gene” has been around for more than three decades, since evolutionary biologist Richard Dawkins first coined the term in his 1976 book, The Selfish Gene. For just as long, the idea has been quite controversial, polarizing scientists, researchers and journalists. Dawkins’s book promoted the hotly debated idea that all living things, including humans are ‘motivated’ by their genes and see the metaphor as being outdated in that it doesn’t allow for randomness.

After the publication of Dobbs’s piece provocatively titled, “Die, Selfish Gene, Die,” numerous writers sharply criticized his take on the subject, including writer Jerry Coyne, who argued that the article made 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.

Blogger Sergio Graziosi, a former molecular neurobiologist, called it “well written” and “well documented” but wrong.

> Claiming that we need new evolutionary concepts to replace the faulty idea of the selfish gene is just downright wrong. What we do need to understand and model in new and more reliable ways is how a genome entirely made up of selfish genes (and other selfish non-coding sequences) can evolve to create monstrously complex networks that allow the astonishing adaptability of human bodies. The challenge is to see how, why and when “selfish”* elements associate and “collaborate” in ever more complex ways (generating the variability that is impossible to pin down to a single gene).

Facing many similar rebukes, Dobbs revised and significantly expanded his article and posted a blog entry explaining his reason for doing so. As Dobbs explained, he modified his original article based on the “public conversation” his article article stirred:

> I am not saying that the all the science described or suggested by the ‘selfish gene’ model is

> wrong. I am observing that while the selfish gene story is adept at taking in new findings and ideas from genomic studies, anthropology, and other evolutionary studies, it does so these days with increasing discomfort to both host and guest. And I am asking, in an age when such new ideas and disciplines are flourishing and new tools are revealing astounding new things about the genome, whether the selfish gene story remains the best way to account for or inspire them.

Graziosi praised Dobbs's willingness to revisit his work in the wake of the criticism, but still contested much of the science writer's take on the subject.

> I was wrong in my evaluation of Dobbs' intentions. He just gave me a lesson on journalistic integrity, leaving a clear and open trace of what he did, why and how, while enriching his content significantly. That's an example that all science journalists should follow, bravo!

In his post and in a comment sent to the GLP following the original posting of this story, Graziosi provided more context to the 'selfish gene' theory and amplifies his concerns about the concept is often mis-characterized:

> The selfish gene metaphor emphasises that selection acts on unique sequences of DNA that can be replicated as a unit (genes). Whenever the effects of a particular DNA sequence favour its propagation (replication within the same cell, the same organism/genome and across generations), the sequence will tend to become more frequent. This creates an environment where each gene's propensity to get copied competes with the same propensity of other genes. The key point is that it is mathematically possible to explain how this basic "selfish replication drive" may generate the whole diversity of life on earth. The theory does include "just selfish" genes that spread without providing any advantage to their host (as you say) but also predicts that (explains why) genes have "an interest" in the welfare of their host: "helping" their host will increase their own chances to get passed on to subsequent generations. From this basic concept it is possible to build models that show how genes will evolve to produce cooperative networks of genes as well as cooperative behaviours between individuals. The "selfish gene " is a simple explanation of how the complexity of life has evolved, it is *not* challenged by such complexity. The more complex mechanisms are found, the more it becomes relevant, not the other way round.

Dobbs's original article, the criticism it provoked and his willingness to revise it show an important and necessary aspect of writing about and researching science. Although the debate over the selfish gene won't end anytime soon, the debate hat it stimulated underscores how important public discourse and intellectual flexibility are when it comes to addressing complex and evolving science.

Read the full, original article: "Die, Selfish Gene, Die" Has Evolved

Read the revised, expanded article: "Die, Selfish Gene, Die" Has Evolved

Read the full, original blog post: “Die, Selfish Gene, Die” Has Evolved

Additional Resources:

- Debate over ‘selfish gene’ theory heats up, Genetic Literacy Project
- The popular (and misleading) view of DNA, Science 2.0
- Adversarial Journalism and The Selfish Gene, Richard Dawkin