

Science looks worse as it's getting better

Science today seems to have more problems. This trend has been attributed to its increasing scale and complexity. It has also fueled the emergence of a multidisciplinary field: *science of science*, which uses data and models to probe science's inner workings.¹

But do we study science because there are actually more problems? Or does science appear to have more problems because we study it?

Consider related lessons from medicine. When new treatment methods are invented, we typically see an increase in patients who may benefit, not decrease, because conditions previously undetectable or ignored are now uncovered systematically.

Science could be the same way. Today we study in minute detail the dynamics of scientific discoveries, careers, teams, and institutions, likely uncovering new problems we didn't know existed.

Cognitive bias too can play a role. Simply attending to specific things can make their prevalence appear to rise, due to selection bias. When my wife was pregnant with our first child, for example, I was struck by how many pregnant women I saw in daily life. Of course, the actual pregnancy rate didn't rise that year; it was just that pregnancy as a phenomenon registered more on our radar.

Similarly, as our quantitative understanding of science deepens, one natural consequence is that we will observe more problems around us in science. Indeed, when you have a hammer, everything could look like a nail.

Therefore, while we might study science more deeply today because of the problems we see in it, we must not forget that science will also appear to have more problems if we study it more.

This suggests a dramatic shift in perspective. As science is increasingly associated with descriptors like "crisis" or "broken," it gives us a reason to be optimistic, not pessimistic. Indeed, it's important to realize that renewed calls for improvement don't mean that things have gotten worse, and science looks worse because it's getting better.

That, to me, offers a hopeful message. While no one wants disappointing news from their doctors, we'd all prefer to be diagnosed sooner rather than later.

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Reference:

1. Fortunato, *et al.* "Science of science." *Science*, 359.6379 (2018): eaao0185.