We’ve all heard the phrase “peer review,” as giving credence to research and scholarly papers, but what does it actually mean? How does it work?

Peer review is one of the gold standards of science. It is a process wherein scientists (“peers”) evaluate the quality of other scientists’ “work.” By doing this, they help ensure the work is rigorous, coherent, was peer-reviewed and adds to what we already know.

Some scientific journals, conferences and grant applications have come up with a better review system. In some cases it is called the “blinded” peer review. This review system does not know the author(s), and the author(s) do not know the identity of the evaluators. The intention behind this system is to ensure evaluation is not biased.

The more prestigious the journal, conference, or grant, the more demanding will be the review process, and the more likely the rejection. This prestige is why these processes are as they are. It involves a number of social interactions that might create biases – for example, authors might be identified by reviewers if they are in the same field, and bias from the process of judging knowledge.

Peer reviewing is also seen as a crucial way of removing personalities and bias from the process of judging ideas, other criteria such as political or economic gain might be used to fit the scope of the journal or there is a fundamental flaw which makes it unfit for publication.

Explainer: what is peer review?
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The peer review process for journals involves at least three stages.

1. The desk evaluation stage

When a paper is submitted to a journal, it receives an initial evaluation by the chief editor, or an associate editor with relevant expertise.

If the editorial team judges there are no fundamental flaws, they send it for review to be blinded. The number of reviews depends on the field. In finance, there might only be one reviewer, while journals in other fields of social sciences might ask up to five reviewers. These reviewers are selected by the editor on the basis of their expert knowledge and their absence of a link with the author(s).

Reviewers will decide whether to reject the paper, accept it as it is (which rarely happens) or to ask for the paper to be revised. This means the author needs to change the paper in line with the reviewers’ comments.

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3. The revisions - if you are lucky enough

If the paper has been accepted after the first round of review, it is sent back to the author(s) for a second review. The process is repeated as many times as necessary for the editor to reach a consensus on whether to accept or reject the paper. In some cases this can last for several years.

Ultimately, less than 10% of the submitted papers are accepted in the best journals in the social sciences. The renowned journal Nature publishes around 7% of the submitted papers.

Strengths and weaknesses of the peer review process

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To understand the strengths, the peer review process is a means to ensure the work is rigorous, coherent, uses past research and adds to what we already know.

To understand the weaknesses, the peer review process can go awry because of conflicts of interest. For example, authors might be identified by reviewers if they are in the same field, and bias from the process of judging knowledge.

Are there any alternatives?

Alternative to the peer review system are as follows: more, or yet to find a better system to evolve research. However, a number of innovations have been introduced to the conventional system to improve its objectivity and efficiency.

Some open access journals (2013-2015) published papers with full title evaluation by external editors who do not know the author(s), and make recommendations for improvement.

For example, authors might be identified by reviewers if they are in the same field, and bias from the process of judging knowledge.

Another idea is to have a set of reviews rating the paper each time it is revised. In this case, authors will be able to choose whether they want to invest more time into a revision or remain relatively fixed, and get work practically published.