# Researchers prefer citing researchers of good reputation

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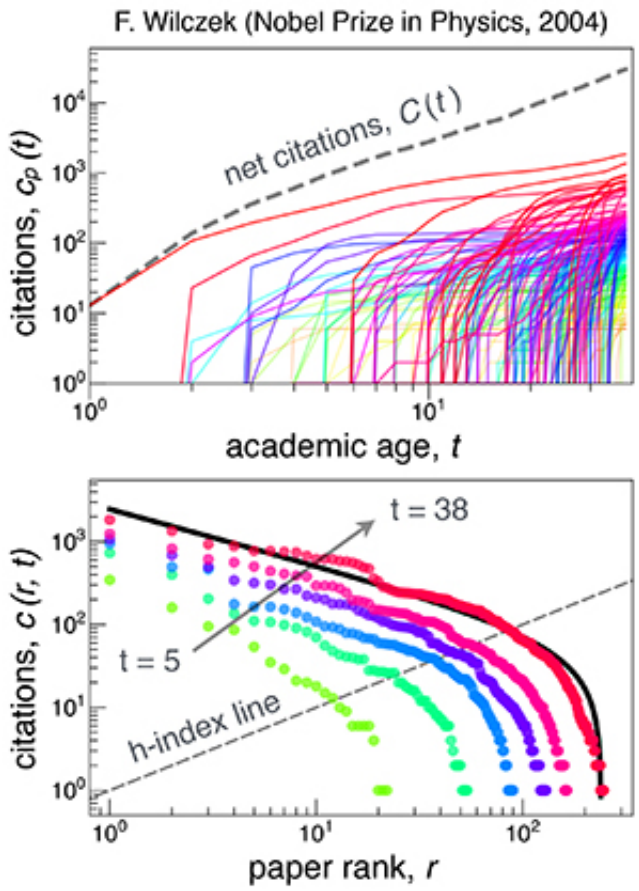


A microscopic perspective of career growth. The number of publications and the net citations from all papers, C(t), are two common aggregate measures used to quantify an individual's scientific productivity and impact. However, little is known about the rate of career growth, illustrated here for F. Wilczek (notable for publishing his Nobel Prize winning research in his first publications as a doctoral student). This graph shows how a career profile can be decomposed into the citation trajectory of individual publications over time. Modeling a career as a complex growth process, based on the feedback loop between capturing new

opportunities and building reputation, provides insights into the patterns of success, strategies for career sustainability, and the value in getting out of the gate running.

If a scientist has a good reputation among his colleagues, other scientists are more likely to cite his publications. According to a study, reputation is crucial for the impact of publications.

"Author reputation is key in driving a paper's citation count early in its life cycle, before a tipping point, after which reputation has much less influence compared to the paper's citation count," says Aalto University Professor Santo Fortunato, pointing out that this is a key finding of the study.

## Quality – not quantity – of publications build authors' reputation

As the quality of science is more and more linked to citation counts, understanding the mechanisms that underlie the life spans of scientists' careers becomes increasingly essential.

The result encourages publishing quality, not quantity. Just a single widely cited high-impact article is very likely to cause what the group calls "a reputation boost".

"The number of journals increases rapidly and so do opportunities for publication. The reputation boost effect speaks in favour of aiming for quality instead of quantity in publishing. This reinforces a research strategy beneficial for science and scientists alike," asserts Fortunato.

The life cycle of heavily cited articles is long in mathematics, where

some publications even seem to "live forever". The papers in other sciences studied – biology and physics – display a "half-life" of roughly five years. The group puts this down to the fast pace of ideation in these fields.

## Effects of reputation on the impact analysed with quantitative methods

The effects of researchers' reputation on their scientific impact can now be analysed with quantitative methods. Statistical physicists at Aalto University Department of Biomedical Engineering and Computational Science (BECS) are collaborating in a study that studies how the value of individual scientists' reputation emerges and how scientific knowledge advances.

The group clarifies how an author's reputation influences the impact of a published article. They have analysed the citation patterns of over 80 000 articles and 7,5 million citations.

"A researcher produces many comparable products – publications – over her career. We use the citations that the publications receive as a measure of scientific impact," explains group leader Professor Alexander Petersen from IMT Lucca.

"The relation between the reputation and the career growth of an individual researcher still remains poorly understood. We wish to provide methods to better evaluate not only scientific output but also the scientists themselves," says Fortunato.

"The career evolution of a scientist is a complex process. Understanding the role of social ingredients – reputation, cooperation, competition, creativity – which underlie it, is an emerging interdisciplinary research

front," says Petersen.

**More information:** Alexander M. Petersen, Santo Fortunato, Raj K. Pan, Kimmo Kaski, Orion Penner, Armando Rungi, Massimo Riccaboni, H. Eugene Stanley, Fabio Pammolli: Reputation and Impact in Academic Careers. *PNAS*, DOI: 10.1073/pnas.1323111111

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