Description

Publishing an article in a science journal earns its authors recognition and respect. It is a form of academic currency. This is because, traditionally, the meaning of an author reflected someone making a substantial contribution to the research project. However, in recent times, the meaning of an author, especially co-author, is rapidly changing. Should it still be understood to represent the complex work and practice of doing science? The ethical basis of academic authorship appears threatened by hyper-competition and the digital revolution in scientific publishing made possible by the Internet.

Goodbye, Good Scientific Practice

The culture of journal authorship varies between major fields. Scientists tend to publish short articles, more than once per year in journals, with multiple authors. By contrast, scholars in the humanities publish less frequently, either alone or with one co-author, in either books or journals. Yet, the pressure to publish is felt across academia. So, looking at trends in authorship is obviously important.

Recently, Schmidt and his two co-authors published a detailed report online. They used Scopus records, from 2010-2016, to investigate co-authorship for 27 fields. In it, they looked at the trends in number of authors per article by focusing on the 20 highest performing authors in each field. The results and conclusions of this study may concern some. To others, it may simply reflect the inevitable changes and differences in scientific working styles.

Main Findings

The analysis by Schmidt et al. shows that over the 6-year period, there has generally been a slight increase in the number of authors per article. Two disciplines showed a zero increase (Psychology and the Arts & Humanities), one actually decreased, and 23 more fields had increases of 0.5 or less. However, one field had an incredible increase of 57.8 authors.

This outstanding field is Physics and Astronomy. It had a mean number of authors per article of 1268.2 (maximum value = 5154). However, this was not because of the influence of one or two papers with many authors. This field is surely complex, and some experiments require many contributors, each performing a crucial task. But is this really being an author? Those writing the 5154-word paper contributed just 1.1 words each.

Ranked next was Medicine and Biochemistry, Genetics, and Molecular Biology. They had corresponding means of 11.0 and 16.7 authors each per article. Both fields had papers with more than 1000 authors on it (respective maximum values of 1193 and 1269). Among the 20 most productive authors in Medicine, half had “authored” more than 200 papers each over the 6 years. The other 10 authors published more than 400 articles under their name.

Schmidt et al. also report a very noteworthy statistic. For Physics and Astronomy and Medicine, the 20 most productive scientists in each field "authored", on average, 59.5 and 43.5 articles per year over their entire career. That amounts to almost 4–5 papers published per month!

Key Conclusions

The sheer number of authors in Physics and Astronomy is mind numbing. In this field, the definition of academic authorship has clearly changed. It no longer follows the idea of a substantial and not merely technical contribution, or of being able to defend the paper as your own. It seems almost pointless to list so many authors, as it makes a mockery of authorship. Looking at the issue from a different perspective, the scale of the experiments is also getting larger and more expensive as this field advances (e.g., CERN hunt for Higgs Boson). A longer author sequence would thus be unavoidable.

In other fields, notably Medicine and Biochemistry, Genetics, and Molecular Biology, authorship is clearly on the rise. It matters for reputation, which in turn matters for funding and for the prestige of the institution where the author works. Moreover, it now seems much easier than before to be a co-author on a paper. This dilution of traditional academic authorship means that key guidelines for journal authorship are no being longer respected (e.g., Vancouver Recommendations).

Science as a Business

Hyper-authorship is not altogether new. By 1985, the "apparent champion" medical paper had 160 authors listed on it. However, this published paper appeared in a Japanese-language journal (as pointed out in a letter by Dr. Newman in the *British Medical Journal*). At that time, 12 authors of a single English-language medical article was thought to be the maximum.

Schmidt et al. argue that the most plausible explanation for this trend in academic authorship is the rise of "factory science". The product is knowledge, packaged in a publication. The workers are the post-docs and PhD students, the bulk of the researchers. The lab head is usually tenured and runs the show. Earlier, the lab head would forego authorship; however, nowadays the price in missed funds and prestige is perhaps too great.

The factory is owned by the university and strives to increase the quantity of its knowledge product (which also serves as a sales currency). The price, if too rushed, is its quality. One well-known way to increase productivity is to divide the scientific labor required into very small, specialized tasks. This is what empirical physicists and biomedical scientists seem to be doing. The Internet makes it easier for people from around the world to collaborate on a project. The big ethical question is should these singular small tasks still merit being a co-author?

In the humanities fields, factory science is harder to pull off. The subject matter is unlike the pure and applied sciences. Here, the medieval guild system prevails, where the author is still involved in most aspects of making the product. He or she can work alone, or when needed has very few helpers (apprentices). In this sense, they are craftspeople.

Looking Ahead

Typically, the first author of a scientific journal article means that you have made the greatest contribution. Following that was the co-author sequence corresponding to one's declining contribution. Successful academic authorship is needed for research funding and career advancement. However, this is done primarily on a competitive basis that relies heavily on bibliometrics (and possibly altmetrics). Unless this evaluation system changes, the incentives to see your name as the co-author of a paper, by whatever means, will only get stronger. We can expect the meaning of authorship to become watered down in the process. One day, it may only be symbolic.

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Category

1. Journal Guidelines
2. Reporting Research

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