

## Coauthorship Hitchhiking: Indicators and Effects in Scientific Development in Mongolia

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### Abstract

This paper discusses about a phenomenon newly called as the “coauthorship hitchhiking,” a term we coined to denote the inclusion of coauthors in peer-reviewed publications without significant intellectual input from these coauthors to the published works. We feel that this phenomenon has become fairly common due to increasing international research interest in Mongolia as international authors include Mongolian researchers as coauthor(s) in their publications. Collaborative work is important and indeed required to advance knowledge frontier, but it needs significant input from all coauthors to be a truly collaborative research output, namely a scientific publication. Although the coauthorship hitchhiking is beneficial to career of individual researchers, it is detrimental to overall improvement of scientific thinking in the country. The authorship should be limited to those who have substantially contributed to the work and who have a shared responsibility for the results.

**Key words:** author, irresponsible coauthorship, collaboration, substantial contribution

### Introduction

Science aims at producing new knowledge, always questioning available knowledge in the light of new data and new theories. In science, the prestige of a given researcher is usually measured by the number of articles published in the peer-reviewed journals of a high standing and how many citations these papers receive. The latter index measures the impact factor on the scientific community (Garfield, 1971). These data can easily be obtained from online international indexes, such as the Journal Citation Report, Science Citation Index, Social Sciences Citation Index, and Arts & Humanities Citation Index.

The Institute for Scientific Information (ISI), established in 1960 and presently a part of the Thomson Reuters Corporation maintains the largest current database on international publications from all fields of science, which can be accessed from the Internet (<http://apps.isiknowl->

[http://thomsonreuters.com/products\\_services/science](http://thomsonreuters.com/products_services/science)). It contains almost forty million international scientific publications dating back to 1945, and once every week, somewhere between twenty and seventy thousand new references are added (Christoffersen *et al.*, 2009).

Mongolia is considered by the Third World Academy of Sciences as one of the 80 science and technology-lagging countries in the world (<http://twas.org>). Although organized infrastructures for modern science were established in the country with the foundation of the National University of Mongolia in 1942 and the Mongolian Academy of Sciences in 1961, it appears that Mongolia was not adequately prepared to delve into the unprecedented venture of modern science. This can be readily seen from the general lack of knowledge, even among scientists, on how scientific research should be done and how quality of scientific output is judged. Data compiled several years ago on the worldwide scientific publishing activity indicate that the number of publications (per million people) by Mongolian researchers was one of the fewest in the period of 1996-2001, and trend was not positive (showing negative trend) compared

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to the period of 1989-1995 (Perez-Iratxeta & Andrade, 2002). Their result was consistent with analyses by Boldgiv *et al.* (2004), who analyzed records of ISI database between 1979 and 2002, and concluded that although the total number of publications by Mongolian authors has increased for the given period, there was no significant increase in the relative citation impact (RCI). Changes of publication quality as measured by RCI showed different trends for various scientific disciplines for Mongolia, but all the fields are well below the world's total publication quality for a comparable period. Additionally, the percentage of papers by Mongolian senior authors has declined (though the trend was not significant). Quality of publications by Mongolian first authors and only Mongolian authors, as indicated by RCI, were significantly lower than collaborative ones (Boldgiv *et al.*, 2004).

All these analyses point to an inevitable conclusion, the same conclusion as that was made by TWAS: the scientific output and quality by Mongolian researchers are poor and that we are lagging behind the world. Of course, there are some glaring exceptions to this general pattern, but the aim of this communication is not to advertise or discredit individual researchers. It is to call the attention to one particular issue. We will elaborate below.

It should be noted that in the science in particular, citation can be dependent on many variables other than scientific merit: an author's reputation, a controversial subject matter, circulation of the journal, availability and extent of library holdings, dissemination of reprints, coverage by secondary indexing and abstracting services and allocation of research funds. Far from representing all that is published in science, the references indexed by the ISI only represent the production from a selected pool of international journals upon which the status of respectability has already been conferred by the international scientific community according to the criteria of visibility, periodicity, regularity, language, extent of indexing by international reference vehicles (master journals), circulation range and place of publication.

Noting these, we consider that we should make our views public in the hope that both foreign and Mongolian researchers will rectify the causes of our concern. If authors respond

positively to our remarks then we believe that Mongolian scholars will move ahead in acquiring ability to publish their research results individually or in responsibly collaborative ways, improving quality of their outcomes. We hope this overview of different views of coauthorship will help facilitate these discussions toward more productive ends.

### **What is coauthorship?**

Coauthorship (collaborative authorship) is a collaborative act whereby multiple authors create the content of a written work. A coauthor is any author of a publication other than the one listed first (Berk, 1989). Coauthoring is common in modern academic works, and it is often necessary because completing a given work may require broader expertise, equipment or resources than a single author can provide. In many cases, the collaboration of different researchers is essential in performing scientific study, and successful collaboration occurs especially when each participant is able to make a unique contribution toward achieving a common vision or goal statement. Supporting this common goal are objectives that have been generated by each of the participants. It is important for each participant to "feel" as though he or she has a significant contribution to make to the achievement of goals. It is also important that each participant be held accountable for contributing to the writing paper.

Collaborative writing can lead to papers that are richer and more complex than those produced by individuals. It is often the case that when collaborators can directly contribute to the manuscript and feel that they have made a difference, they become more involved with the writing, resulting in a better final outcome.

However, the coauthorship should be limited to those who have substantially contributed to the work and who have a shared responsibility for the results. The "substantial contribution" could include some combination of one or more of the following: a) concept or design, b) data collection and processing, c) analysis and interpretation of the data, d) writing substantial sections of the paper, and e) approving the final draft of manuscript before publication (Osborne & Holland, 2009). Therefore, coauthors should have participated sufficiently in the work to take

public responsibility for the content.

### **What is coauthorship hitchhiking?**

In evolutionary biology, there is an interesting phenomenon in which a nucleotide variant becomes fixed in a population as natural selection fixes another favored locus that is closely linked with the nucleotide variant. The nucleotide variant may not necessarily be adaptive to the carrier (Futuyma, 2009). It is also known as genetic hitchhiking (selective sweep is another term for it), or a free ride in a layman's term.

This note discusses about another hitchhiking phenomenon, in case of authorship of scientific outcome. We call this phenomenon the coauthorship hitchhiking, which is specially widespread in the publications of biological research results in Mongolia because its fields require more collaborative effort than some other scientific disciplines, creating possibilities of coauthorship hitchhiking in some cases.

Claxton (2005) reported that over the course of ten years, 20 authors in one particular field were identified as having each published an average of 32 papers or more per year (which is equivalent to publishing a paper on average every 11.3 days). A survey of non-first authors in the basic and medical sciences revealed that 26% admitted to not having contributed substantially to the paper (Shapiro *et al.*, 1994). Similarly, in the business literature 35% of authors surveyed reported assigning authorship to someone who had done little or no work (Manton & English, 2008).

Coauthorship implies personal responsibility for the content of the paper. Hence, gratuitous coauthorship makes coauthors vulnerable to charges of fraud, if the content of the paper is subsequently shown to have been falsified. It is no defense for the coauthor to claim, "I am not guilty of fraud. I really had nothing to do with the paper". The coauthor is, indeed, guilty – unwittingly perhaps – but guilty nevertheless. In other circumstances, by assigning coauthorship irresponsibly, the first author gives the coauthor the legal right to steal his work. Coauthors are free to use the work in any way they see fit and to claim it as their own without recognition of the first author. The first author may have no defense when he sees that some of his work has

been published by a gratuitous coauthor without credit to the person who truly did the work. Therefore, responsible coauthorship requires the coauthor to have made a substantial and specific contribution to the work. It indicates active participation with contribution of thought and effort, and it guarantees that the coauthor has the ability to defend the results and that he or she assumes responsibility for them. It is different from names that appear in an acknowledgment, which serves to recognize lesser contributions (Berk, 1989).

### **What is indication of coauthorship hitchhiking?**

In many works published by international authors with Mongolian coauthors, we often found that assignment of coauthorship has obviously been abused, which no longer guarantees that the listed person has truly made a substantive contribution to the paper, which can be considered as coauthorship hitchhiking.

Table 1 provides some of the most apparent indicators of coauthorship hitchhiking and their explanation. The list is not exhaustive, as there are more subtle indicators of hitchhiked coauthorship.

### **Why do we discuss about coauthorship hitchhiking?**

We believe that most international researchers have been attempting to improve scientific education and science capacity in Mongolia. However, their intention can be misused. Just as a nucleotide variant that is not necessarily adaptive can be swept to fixation by genetic hitchhiking, coauthors, who are not necessarily capable of carrying out independent research may be "swept" to scientific laurels in small countries like Mongolia.

We have the impression that, in most cases, not all of the authors named, especially Mongolian ones were fully involved in the process of preparing the manuscript for publication. Often we find that well known senior authors do the compilation of manuscript, take a responsibility for review processes, but the names of Mongolian coauthors are enclosed as gesture of charity. In addition, as the editors of Mongolian Journal of Biological Sciences,

Table 1. More apparent indicators of hitchhiked coauthorship and their explanations.

<p>1. <i>Misspelled coauthor names</i> If a publication has the name(s) of Mongolian coauthor(s) misspelled, it is the most glaring example for the lack of any input by the latter coauthor(s).</p> <p>2. <i>Misspelled geographic and personal names</i> Misspelled Mongolian geographic and personal names within the paper mean that Mongolian coauthor(s) has not done at least the proof-reading of finalized manuscript. If this much effort was not made, it is clear that the rest of the publication has not received a significant intellectual input from Mongolian coauthor(s).</p> <p>3. <i>Coauthors in the acknowledgement section</i> If a coauthor is also included in the acknowledgement section of that particular publication, then it is a clear way of senior author saying that there was no contribution by Mongolian coauthor(s) in the actual research and writing of the manuscript.</p> <p>4. <i>Incorrect or incomplete affiliation and contact addresses</i> The misspelling or incomplete writing of the contact addresses including e-mail account, and/or incorrect compilation of their affiliations rather than official description of organizations in Mongolia all indicate the absolute lacking of the participation of Mongolian coauthors in the preparation or finalization of the manuscript.</p> <p>5. <i>Inclusion of Mongolian coauthors in the works of irrelevant fields of study</i> If the Mongolian researcher's name is included as a coauthor in a particular publication even he or she worked in different field than topic of that paper, and lacking of concrete information on certain contributions of the Mongolian author to the achievement of goals or obtaining results, then it is evident that the latter one did not took in part of the writing manuscript.</p> <p>6. <i>Absence of Mongolian funding institutions in the acknowledgements</i> If only the foreign funding organizations are acknowledged although the research project was bilaterally supported, then it expresses delusive coauthorship of the Mongolian ones.</p>
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the only single peer-reviewed English language journal existing in the history of modern science in Mongolia, occasionally we discover that manuscripts have been compiled and submitted or revised without the knowledge of named Mongolian coauthors.

Therefore, we have only to conclude that well-experienced foreign scientists are encouraging the development of such bad habits by their example in some cases and that these irresponsible attitudes may hamper the advancement of Mongolian scientists. We are not pleased by such examples of gross lack of professional conduct.

Instead of such a indecorous trusteeship, it would be much beneficial to Mongolian researchers if international experts indoctrinate and demonstrate how to design research and write scientific outcome rather than endowing ready products. Otherwise, researchers might

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remain incapable in producing high-standard scientific outcome.

With regard to coauthorship again, we believe it is the duty of all individuals to satisfy certain criteria if they are to be listed and share the credit for a multi-authored manuscript. The International Committee of Medical Journal Editors has published a Special Report on Uniform Requirements for Manuscripts Submitted to Biomedical Journals. We quote part of the section of the 4th edition of their report on authorship. It states the requirements that need to be met if one wishes to be named as a co-author. "All persons designated as authors should qualify for authorship. Each author of a paper should have participated sufficiently in the work to take public responsibility for the content". "Authorship credit should be based only on substantial contributions to (a) conception and design, or analysis and interpretation of data; and

to (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published. Conditions (a), (b) and (c) must all be met” (<http://www.nejm.org/general/text/requirements>). This is also that same in case of some other journals, such as the Proceedings of the National Academy of Sciences of the USA (PNAS), which requests and publishes information about the contribution of each person named as having participated in a submitted study, at least for original research articles (<http://www.pnas.org>).

Other journals require that the senior author of a manuscript should have a duty to ensure that all the named authors have seen and approved the original and revised versions of the manuscript and are in agreement with its content before it is submitted to the editorial office. The senior author should also ensure that all those who have contributed to the research are included or acknowledged appropriately either as a coauthor or in the acknowledgements (Anderson *et al.*, 2000).

Finally, authors need to address the issue of how to acknowledge those whose role was a limited contribution. The technical help, such as collection of sample materials, raw data or literature sources, assisting in the field and laboratory works, financial and material support, general supervision do not all constitute a substantial contribution worthy of authorship. Those who have contributed in ways that do not merit authorship should be appropriately acknowledged in the “Acknowledgements” section. It means individuals who do not have intellectual ownership of the final product are the candidates for acknowledgement, rather than authorship.

### What we should do in the future?

We have reached the end of the “lost decades of science and technology” in Mongolia since the country opened its door to the modern science. Until recently, no peer-reviewed scientific journal has existed in Mongolia, during the more than 60 years of activities of research institutions. One of the main aberrations of the development of science in Mongolia, which should be highlighted here is the simplified approach of understanding of the real scientific standard as there had been

no criteria for evaluation of research outcomes of scientists. Instead of making a contribution to the global science, all research institutions in Mongolia established local periodicals of limited significance and distribution, such as proceedings at academic institutes or scientific transactions at universities. Those periodicals have been irregularly published over many years in Mongolian with low quality in both scientific and publishing merits, accepting whatever submitted, without broader audience and circulation. Unfortunately, majority of research fellows were adapted to this and restricted their publications to produce papers that are rhetorical in appearance, but limited in substance, rather than creating internationally recognized outcome with valuable results. This situation still exists in the scientific community of Mongolia, except few individuals who intend to accept the modern standard of scientific development. However, the current concept of scientific judgment and outworn notion in Mongolia should be changed immediately.

The other disadvantage of science development in Mongolia is that there is no consistent nationwide investment in research, with exception of research grants provided by the Science and Technology Fund of the Ministry of Education, Culture and Science. Research institutions and many researchers in the country have come to depend exclusively on its insufficient funding to sustain their scientific output. Under these conditions, and considering the average size of research grant, it becomes difficult even to think about a truly high standard of science.

As we have alluded above, when compared to other major countries, Mongolia has a smaller number of international publications and fewer citations in internationally indexed periodicals as compared to the number of research fellows with advanced degrees. Both these measures, however, only represent quantitative assessments of information production and its relative impact. The number of publications by few researchers is not necessarily an indication that scientific community of Mongolia has attained a higher level of competence, and especially when most of researchers publish more articles in junior authorship than senior authorship.

In addition, wherever scientific argument is stagnant, we could argue that it is an indicator

of relative inactivity of scientific research. That is exactly the case in Mongolia. Most of us do not question each other's results, but most of us take whatever we read or hear as granted, that probably means one or all of the following: we are not enthusiastic enough what we do, we are not willing to make changes, and thus, scientific activities by us are not dynamic enough. These kinds of situation are not well received by real scientists.

What we can conclude is that science in Mongolia as collectively practiced still has not reached the minimum threshold of how science should be practiced in developed nations. Certainly, the country has progressed scientifically during recent few decades, but this progress is not truly sufficient. The challenge for Mongolian researchers is how to both publish and become recognized for work that effectively contests the status quo. Consequently, in order to participate in effectively international science, we depend primarily on the quest for truly qualified scientific enterprise.

Having alluded to many disadvantages, it must be emphasized that we have no doubt in the potential capacity of Mongolians to produce qualified scientific outcomes involving high technology or to question and modify important aspects of universal knowledge. After all, new and interesting ideas are not the privilege of a small group of nations or cultures.

We appreciate the fact that some Mongolian authors are disadvantaged in having to publish in English since it is not their native language. Usually, referees and editors routinely make minor corrections to language and presentation, but cannot be relied upon to do so. Authors who are uncertain of their ability to write clear scientific English should be reminded that it is essential that they consult a native English speaker before submission. When the scientists may not excel in the dominant language, acceptable writing skills, prevailing cultural norms etc., their chances of publishing in high status journals become dim, even if their papers contain important new perspectives.

Finally, we must always give precedence to quality over quantity of publications, creativity over visibility of scientists. We should always stress long-term progress over short-term products and give priority to questions over answers.

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