

**Opinion**

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Converting Science into a More Democratic, Multilingual Activity

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Although not everyone has a computer yet, science has become much less an elitist activity compared to centuries before the 21st thanks to the use of internet by millions of new scientists. Dozens of papers are available after few minutes search and this is much a better situation compared to previous personal visits to sound libraries located far away. Yet social inclusion efforts in the scientific community are far of fully recognizing the work of women, ethnical groups, people speaking mother languages other than English, and English-speakers living outside western countries, and working at non top-ranked universities. An insight into the history of the acquisition of knowledge suggests that multilingual –instead of monolingual has been practiced by successful collectors of knowledge like ancient the Greek voyagers or Middle Age priests. In our times of internet, scientists using fewer languages and neglecting to consult papers by women and countries poorly represented in the bibliometrically manipulated search engines are more prone to discover what has been already found by someone else. Science needs scientists to turn back to the times where the person, not the engines, were guiding the search of information based on academic but also geographic and (why not) gender equilibrated criteria.

Keywords: Bibliometrics; Gender- bias; History of scientific publications; Nationality-biass; search engines**Opinion**

Although not everyone has a computer yet, science has become much less an elitist activity compared to centuries before the 21st thanks to the use of internet by millions of new scientists. Still the efforts for social inclusion in the scientific community are far of fully reaching women, linguistic minorities, people speaking mother languages other than English, and even English speakers living outside western countries, and working at non top-ranked universities. What we call science is a western-culture-invented way of acquiring knowledge by critically contrasting ideas with real evidence. Per thousands of years, the exciting adventure of getting basic knowledge, sharing it, and criticizing the ideas of each other has been an activity made by plutocratic groups called scholars. Slaves and other exploited people had-and in many countries have to work for producing the surpluses paying the free time used by thinkers and experimenters. That occurred in ancient Greece, monasteries-and-palaces during the middle Age, and even in the very rich universities of England, the United States, and other

countries which power resulted from the Industrial Revolution. Concomitantly, the sequence of languages used by the “elite of scholars of the west” for exchanging ideas has included Greek, Latin, French, and English. Publications in languages different to the mentioned ones were (and still are) considered as vulgar or, in the best of the cases, “second class” knowledge. Moreover, publishing in English –but in journals settled in countries like India, the African continent, and the Middle East is considered as “second-class” science by mainstream publishers and bibliometrics generating the most sound “impact factors” and indexations.

Agriculture provides a good example of the importance of multilingualism in the search of knowledge. Food production is much older than science so people from many different languages have developed their own methods and knowledge on how to produce food. Therefore, restricting the exchange of agricultural ideas by means of using only one language reduces the chances of experts from different backgrounds to learn from

each other. For ignoring the languages of the Indigenous groups like the Mayan, Guna and Kichwa in Latin-America, western-educated agronomists there tried to impose monoculture over traditional Agroforestry during the 1950's, 60's, 70's, and 80's. Only towards the last 15 years of the 20th century the traditional, more sustainable agroforestry systems became widely recommended by the scientific community for keeping food security and a healthy environment, something indigenous scholars learned hundreds of years earlier.

Back to the preeminence of particular languages from Greek to English in science, it can be argued that scholars have used such languages as linguae francae facilitating communications among researchers from different countries. This is just partially true: ancient Greeks exchanged information with Egyptians, Babylonians, Persians, and even Indians and it is hard to imagine that Greek was the only language used for such interactions. In the realm of religion, some Christian priests, even trying to monopolize knowledge during the middle Age, used diverse forms of German, Italian, and even Hindi, Mandarin, Tagalog, and Latin-American indigenous languages as well. Thus, trying to standardize science by bibliometrically prizes papers written in one single language, printed by expensive, western-biased journals reduces the volume of exchanged ideas compared to multilingualism.

Internet has made scientific information more available than before. Yet scientists need to individually become more multilingual, and find ways to escape the virtually default-given papers provided by the algorithms of those electronic engines. Some publishing companies, fiercely trying to monopolize science, seem more interested in profit than in Science itself. They get payments by authors -without paying reviewers, and -in an effort of staying attractive for the academics, such companies apply pressures influencing bibliometrics. All these probably in

order to authors paying the publishing oligopoly to feel like "well qualified". Before the internet, scientists like the developers of the current Evolutionary Theory tried to be multilingual. Ernst Mayr was German but also used English, G. Ledyard Stebbins was US-American, yet knew Italian, Theodozious Dobzhansky knew at least Ukrainian, Russian, and English and that enabled him to recommend Western biologists to keep an eye on the works by Soviet Union's Ivan Ivanovich Smallhaussen. The moral is that, for providing more sound and useful scientific ideas, it is recommendable to have a wide cultural scope, significantly enhanced by learning more languages.

The "publish or perish" dilemma has generated an age of industrial, no-more handcrafted scientific writing. By only typing keywords and clicking on the searching engines, current researchers need just a few hours for getting large amounts of literature, yet the first papers appearing are the ones put "in fashion" by artificially generated bibliometrics where sectors like women and developing countries remain underrepresented. Scientists themselves can find a solution: look for journals and information about a particular topic by country or region, and not only by keywords. Check how many publishers are in the world -including open access and "poor" publishers, look for their publications, instead of relying only on the expensive, "mainstream" publishers. Take some time for checking who are the women making science, where they are, look for affinities respect to your work, consult their works, learn, and criticize like for anyone else.

For accelerating the progress of science in our times of internet, it is important to assume the challenge of learning and consulting papers using as many different languages as you can. Expanding the diversity of the consulted sources can avoid you to discover what is already known.



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