

Exclusion of the non-English-speaking world from the scientific literature: Recommendations for change for addiction journals and publishers

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Abstract

Background: While English is only the native language of 7.3% of the world's population and less than 20% can speak the language, nearly 75% of all scientific publications are English. **Aim:** To describe how and why scientific contributions from the non-English-speaking world have been excluded from addiction literature, and put forward suggestions for making this literature more accessible to the non-English-speaking population. **Methods:** A working group of the International Society of Addiction Journal Editors (ISAJE) conducted an iterative review of issues

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related to scientific publishing from the non-English-speaking world. **Findings:** We discuss several issues stemming from the predominance of English in the scientific addiction literature, including historical drivers, why this matters, and proposed solutions, focusing on the increased availability of translation services. **Conclusion:** The addition of non-English-speaking authors, editorial team members, and journals will increase the value, impact, and transparency of research findings and increase the accountability and inclusivity of scientific publications.

Keywords

addiction linguistics, diversity, language, publication, scientific discourse

Globally, there are over 7100 spoken languages (Rymer, 2012). The most commonly encountered native languages are Mandarin Chinese (spoken by 20% of the Earth's inhabitants), Hindi-Urdu (8.5%), English (7.3%), Arabic (6.4%), Spanish (5.4%), and Bengali (3.4%) (Central Intelligence Agency, 2021). Yet, despite this linguistic diversity, there is a preponderance of English-language articles in the scientific literature. Today, over three-quarters of scientific papers are in English (Deng, 2015; Montgomery & Crystal, 2013). In some fields, such as the natural and social sciences, over 95% of the papers are published in English (Liu, 2017). In addition, nearly 80% of all indexed journals (Gordin, 2015; van Weijen, 2012) and the world's top 50 journals are in English (Huttner-Koros, 2015). Why is this?

A combination of social influences and historical developments is primarily responsible for English rising to be the predominant language of scientific publications (Crystal, 2012; Gordin, 2015). Historically, China, Iraq, Greece, and Italy have housed scientific learning centres in their native languages (Gordin, 2015). From the late medieval period to the mid-17th century, Latin's hold over the language of science diminished (Porzucki, 2014). Before World War I, most scientific publications were in English, French, and German; roughly one-third each. In the early 1900s, schools in the United States extensively taught foreign languages, which allowed native English speakers to access this literature. Following World War I, scientists from Belgium, Britain, and France boycotted Germany and Austria, and newly established

international scientific organisations operated in English and French only. Subsequently, the United States banned – and even criminalised – the German language in 23 states, eradicating German scientific discourse in most of North America. Following World War II, with the serial collapse of German as the up-and-coming language of science (Burton, 2021; Gordin, 2015; Porzucki, 2014), English predominated. More researchers began conversing in English with the increasing influx of scientists to the United States from Europe and abroad. In the 1960s, approximately 40% of all published scientific literature was still published in French, German, or Russian (Deng, 2015). Yet, due to America's increasing worldwide presence through Hollywood, military incursions, travel, and a surge in research activity, coupled with the persistent need for a shared language, by the 1990s, English became the undisputed *lingua franca* (Deng, 2015).

Approximately 17% of the world's population can speak English, most as a second language (Lane, 2019; Lyons, 2021). Thus, the predominance of the English language in the global scientific community leads to the exclusion of 80% of the world's population from access to and participation in most of the world's published academic literature (Frayne et al., 1996). For example, systematic reviews and meta-analyses frequently induce English language bias by excluding findings from non-English-language studies (Jackson & Kuriyama, 2019; Neimann Rasmussen & Montgomery, 2018; Nussbaumer-Streit et al., 2020). English proficiency has become an

unofficial requirement for success in science and academia (Curry & Lillis, 2018; Lillis & Curry, 2010). Journal editors and their boards must also be fluent in English writing and speaking (Loria & Arroyo, 2005; Meena & Chowdhury, 2014; Xu et al., 2019), causing a dramatic underrepresentation of non-English-speaking scientists in selecting journal manuscripts (Nguyen & Tran, 2019). English has served as both a linguistic and a cultural gatekeeper to scientific discourse (Márquez & Porras, 2020; Tardy, 2004).

The concerns described above are highly relevant when it comes to addiction research. Addiction is a global, ubiquitous disorder. However, many components of addiction research have a more regional and national theme. For example, Ayurvedic medications used by some 700 million people in India commonly contain alcohol, yet these medications are rarely discussed in leading addiction journals (Maithani et al., 2019). In addition, Google Scholar's top 20 addiction journals (Google Scholar, 2015) are in English only. Even the *International Journal of Drug Policy* and the *International Journal of Mental Health and Addiction* – two of the top 20 journals indicating a desire to appeal to an international audience – do not have languages other than English available to their authors (according to their journal websites).

This paper will consider expanding access to the scientific literature to include those without proficiency in the English language. We will begin by discussing some specific problems that result from excluding most of the world's population from the scientific literature. We will conclude with several recommendations for change. Throughout this paper, the term "English speakers" refers to those with some comfort with English reading and writing; whether they can "speak" English is not relevant.

Why does English predominance in the scientific literature matter?

English predominance excludes the non-English-speaking populace from learning and contributing

to the predominant scientific literature (Ramírez-Castañeda, 2020). This may discourage many from entering academia. Furthermore, even scientists who speak English but are not native speakers often cannot express themselves in English as they could in their native language, putting them at a significant disadvantage. Also, those skilled in English as a second language are typically from those countries containing the most scientific resources. Therefore, those individuals from less economically privileged countries are further excluded from the international scientific discourse. The relative absence of non-English-speaking scientists in the scientific literature also biases research priorities to those most relevant to the English-language sphere.

Due to the non-trivial costs of translation services, many non-English-speaking authors may be reluctant to pay for these services without an assurance of publication. This may lead to a far less optimal alternative: predatory journals (Kurt, 2018; Laskowski-Jones, 2017). Predatory journals are open-access publishing business models where publication fees are charged without providing editorial input, peer review, or other features associated with more established journals (Babor & Ward, 2018). Predatory journals often falsely claim to have high impact factors, defined as the total number of citations component articles receive over one or more years (Laskowski-Jones, 2017; Memon, 2017; Thakuria & Saikia, 2016). Babor and Ward (2018) reported that as many as 20 journal titles in the addiction field operated on apparent predatory models, noting that most of their editors were either non-existent or impossible to contact. The economic barrier of translation to traditional scientific publications may partly explain the rising number of predatory journals targeting non-English-speaking researchers.

As indexed journals cite English-language papers more than non-English-language ones, current metric systems create a circular system whereby English-language papers remain the most visible. For example, when South American articles receive publication in higher

impact English-language-only journals, they may be accessible and more frequently cited by English-language readers.

Perhaps one of the most toxic consequences of English-language predominance in the scientific literature is the resultant focus on topics of concern to English speakers (including those with the resources to learn English as a second language). Already biased by funding availability, this adds to the relative neglect of issues paramount to countries with limited resources.

Proposed solutions

There is no clear road to mitigating English predominance in the scientific literature. Or even the direction our corrections should take. Should we aim to get more manuscripts from non-native English speakers published in English (e.g., offering free translation services), or put our efforts into getting more papers published in their native language in traditionally English-only journals? Strong arguments exist for both sides; we propose five possible solutions to assist in the discussion. These solutions build upon strategies discussed in *Publishing Addiction Science* (Babor et al., 2017; Stenius et al., 2008).

1. *Journals should encourage non-English speakers to publish in their native languages* (Márquez & Porras, 2020). Journals should create linguistically (and geographically) diverse editorial boards, inclusive of multiple languages, to make it possible for non-English-language speakers to communicate their contributions to scientific discovery. Primarily, the issue involves the diminished visibility of how the contributions are communicated rather than the ability to contribute to science. To that end, publications from non-English-speaking regions do not have the same visibility. However, this does not mean that these regions do not contribute to
- scientific discovery. Yet, even in these circumstances, presumably, English would remain the shared language and undermine the role of having other languages represented. For example, several high-quality, regional publications in native languages exist, such as *Nordic Studies on Alcohol and Drugs*, *Addicta* – the Turkish Journal on Addictions, and *Exartisis* – the Greek scientific journal on addiction issues. However, the official language of publication of all these regional journals remains English. In a similar vein, should an English-language journal, such as the *American Journal on Drug Abuse and Alcoholism*, publish an article in Turkish, given it is unlikely that non-Turkish speakers or those residing outside Turkey would read it? Alternatively, journal boards could target the most spoken languages worldwide, significantly improving their reach.
2. *Journals should increase the accessibility of high-quality translation services for scientific publishing across languages*. There is a need for a common language for communication, allowing for a multilingual environment through translations across languages. A common language improves linguistic diversity and enhances inclusion. However, translation services come at a cost, further disadvantaging non-English-speaking researchers with limited resources. Publishers should provide discounted or free English-language editing for scientists from emerging countries with limited resources.
3. *Journals should encourage duplicate publication in a second language, preferably the authors' preferred language or even the official language of the country of publication*. For example, the *Canadian Journal of Addiction* publishes papers in English or French, both official Canadian languages – rather than merely the preferred languages.

Journals could also consider posting a certain number of papers per issue in the authors' preferred languages in addition to English or as a supplement. In addition, journals within shared fields or international organisations could provide free or reduced-cost editing services for non-English-speaking authors. However, these efforts should also consider funding and publisher collaborations as the successes of these approaches depend upon editorial service support, which is ultimately an issue of monetary availability.

4. *Journals and publishers should begin to explore the possibility of using universal translators for both their authors and readership* (Leinster, 1945). This option may be the most financially viable and efficient solution to provide widespread and equitable access to the financial literature. Google Translate is improving rapidly, and the technology will likely enable high-quality paper translation in the not-too-distant future (Google, 2021). Like Google Translate, the end-user sends the preferred language for their browser, and the translator does the rest. However, there are ecological sustainability issues around applying artificial intelligence language technologies (Bender et al., 2021). Similarly, with artificial intelligence improving to be genuinely multilingual, there are identical incentive barriers that motivate an English-language-centric science. Ultimately, it is up to the academia international collective to fix the inclusion problem.
5. *Journal article and publication metrics should be developed that allow non-English-language journals to be cited more easily and equitably.* The most commonly used search engines (e.g., PubMed) are biased towards manuscripts published in English-only journals. Similarly, van Leeuwen et al.

(2001) discussed language biases in the coverage of the *Science Citation Index*, identifying several consequences for international comparisons of national research performance. For example, the authors concluded that the value of publication impact factors largely depends on whether one includes or excludes publications in journals with impact factors written in non-English languages (Van Leeuwen et al., 2001). With the influence of the United States and the United Kingdom in decline (Wikipedia, 2021), it would be prudent for publishers to prepare for a less English-centred environment. For example, in 2016, China became the country with the highest science output, as measured by the number of publications (Tollefson, 2018). It would be useful for the non-Mandarin-speaking population to have access to this literature, too.

Economic and publishing considerations

In addition to the ethical concerns noted, there are significant economic considerations in enacting changes in publishing policies and practices. Changes from publishers leading to a more equitable representation of scientific literature from non-English-speaking persons will require financial incentives in addition to ethical arguments. These arguments must come from a thoughtful consideration of the expenses and income from designing a more inclusive approach to languages. For example, what are the specific aims of this effort? What services will be required? Would these changes lead to an increase in subscriptions, downloads, or readership? Would individual journals experience an improvement in metrics (e.g., Impact Factor, Altmetrics)? Which, and how many languages should be covered? Are there approaches that publishers could use to encourage authors to utilise English translation services, e.g., is it less expensive to obtain a

professional English translation than to publish in a predatory journal (although publication is not guaranteed)? And if costs of translation services decrease with software improvements, will this approach become increasingly viable? The profit and losses are outside the scope of individual journals and must be instituted and conducted by publishing houses, preferably in consultation with journal editors.

Conclusions

International publications could become increasingly accessible to people speaking other languages with the right incentives. For example, during the COVID-19 pandemic, academic conferences radically changed, forcing many to move online or to virtual platforms. Automatically, this generated easier access for many scientists, saving time, money, environmental costs and becoming more inclusive to researchers in rural and remote areas and with disabilities. In addition, international academic conferences have considered diverse time zones for their schedules and have accepted abstracts, workshops, and presentations in non-English languages. Others, like the largest academic international conference for the R programming language, have used the funding to live translate to and from English (The R User Conference, 2021). There is also an enhanced ethical drive within individual conscience in the international community to increase inclusivity and diversity. That includes making academia language-accessible, too. Many researchers can share and attain knowledge based on the robust global community and collective effort and making that part of academia globally diverse and inclusive.

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References

- Babor, T., Morisano, D., Stenius, K. & Ward, J. (2017). How to choose a journal: Scientific and practical considerations. In T. F. Babor, K. Stenius, R. Pates, M. Miovský, J. O'Reilly & P. Candon (Eds.), *Publishing addiction science: A guide for the perplexed* (2nd ed., pp. 37–70). Ubiquity Press.
- Babor, T. F. & Ward, J. H. (2018). Caveat emptor: Predatory publishers, rogue journals, and the potential corruption of addiction science. *Journal of Studies on Alcohol and Drugs*, 79(4), 509–513. <https://doi.org/10.15288/jsad.2018.79.509>
- Bender, E. M., Gebru, T., McMillan-Major, A. & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency (pp. 610–623). New York, NY: Association for Computing Machinery (FAccT '21). <https://doi.org/10.1145/3442188.3445922>.

- Burton, K. D. (2021). *The scientific and technological advances of World War II*. The National WWII Museum. <https://www.nationalww2museum.org/war/articles/scientific-and-technological-advances-world-war-ii>
- Central Intelligence Agency. (2021). *Field listing – Languages*. Central Intelligence Agency. <https://www.cia.gov/the-world-factbook/field/languages/>.
- Crystal, D. (2012). *English as a global language* (2nd ed.). Cambridge University Press.
- Curry, M. J. & Lillis, T. (2018). *The dangers of English as lingua franca of journals*. Inside Higher Education. <https://www.insidehighered.com/views/2018/03/13/domination-english-language-journal-publishing-hurting-scholarship-many-countries>
- Deng, B. (2015). *Why is English the language of science?* Slate Magazine. <https://slate.com/technology/2015/01/english-is-the-language-of-science-u-s-dominance-means-other-scientists-must-learn-foreign-language.html>
- Frayne, S. M., Burns, R. B., Hardt, E. J., Rosen, A. K. & Moskowitz, M. A. (1996). The exclusion of non-English-speaking persons from research. *Journal of General Internal Medicine*, 11(1), 39–43. <https://doi.org/10.1007/BF02603484>
- Google. (2021). *Google Translate*. Google. <https://translate.google.ca/>
- Google Scholar. (2015). *Addiction – Google Scholar metrics*. https://scholar.google.com/citations?view_op=top_venues&hl=en&vq=med_addiction
- Gordin, M. D. (2015). *Scientific Babel: How science was done before and after global English* (Illustrated edition). University of Chicago Press.
- Huttner-Koros, A. (2015). Why science’s universal language is a problem for research. *The Atlantic*. <https://www.theatlantic.com/science/archive/2015/08/english-universal-language-science-research/400919/>
- Jackson, J. L. & Kuriyama, A. (2019). How often do systematic reviews exclude articles not published in English? *Journal of General Internal Medicine*, 34(8), 1388–1389. <https://doi.org/10.1007/s11606-019-04976-x>
- Kurt, S. (2018). Why do authors publish in predatory journals? *Learned Publishing*, 31(2), 141–147. <https://doi.org/10.1002/leap.1150>
- Lane, J. (2019). *The 10 most spoken languages in the world*. Babbel Magazine. <https://www.babbel.com/en/magazine/the-10-most-spoken-languages-in-the-world>
- Laskowski-Jones, L. (2017). Don’t fall for predatory publishers. *Nursing*, 47(10), 6. <https://doi.org/10.1097/01.NURSE.0000524763.43376.83>
- Leinster, M. (1945). *First contact*. Astounding Science Fiction.
- Lillis, T. & Curry, M. J. (2010). *Academic writing in a global context: The politics and practices of publishing in English* (1st ed.). Routledge.
- Liu, W. (2017). The changing role of non-English papers in scholarly communication: Evidence from Web of Science’s three journal citation indexes. *Learned Publishing*, 30(2), 115–123. <https://doi.org/10.1002/leap.1089>
- Loria, A. & Arroyo, P. (2005). Language and country preponderance trends in MEDLINE and its causes. *J Med Libr Assoc JMLA*, 93(3), 381–385.
- Lyons, D. (2021). *How many people speak English, and where is it spoken?* Babbel Magazine. <https://www.babbel.com/en/magazine/how-many-people-speak-english-and-where-is-it-spoken>
- Maithani, M., Grover, H., Raturi, R., Gupta, V. & Bansal, P. (2019). Ethanol content in traditionally fermented ayurvedic formulations: Compromised good manufacturing practice regulations – compromised health. *American Journal of Drug and Alcohol Abuse*, 45(2), 208–216. <https://doi.org/10.1080/00952990.2018.1529181>
- Márquez, M. C. & Porras, A. M. (2020). Science communication in multiple languages is critical to its effectiveness. *Front Commun*, 5. <https://www.frontiersin.org/articles/10.3389/fcomm.2020.00031/full>
- Meena, S. & Chowdhury, B. (2014). How international are the leading orthopedic journals: A look at the composition of the editorial board members of the top orthopedic journals. *Archives of Orthopaedic and Trauma Surgery*, 134(5), 619–622. <https://doi.org/10.1007/s00402-014-1975-y>
- Memon, A. R. (2017). ResearchGate and impact factor: A step further on predatory journals. *JPMA J Pak Med Assoc*, 67(1), 148–149.

- Montgomery, S. L. & Crystal, D. (2013). Does science need a global language? *English and the Future of Research*.
- Neimann Rasmussen, L. & Montgomery, P. (2018). The prevalence of and factors associated with inclusion of non-English language studies in *Campbell Systematic Reviews: A survey and meta-epidemiological study*. *Systematic Reviews*, 7(1), 129. <https://doi.org/10.1186/s13643-018-0786-6>
- Nguyen, A. & Tran, M. (2019). Science journalism for development in the global south: A systematic literature review of issues and challenges. *Public Understanding of Science*, 28(8), 973–990. <https://doi.org/10.1177/0963662519875447>
- Nussbaumer-Streit, B., Klerings, I., Dobrescu, A. I., Persad, E., Stevens, A., Garritty, C., Kamel, C., Affengruber, L., King, V. J. & Gartlehner, G. (2020). Excluding non-English publications from evidence-syntheses did not change conclusions: A meta-epidemiological study. *Journal of Clinical Epidemiology*, 118, 42–54. <https://doi.org/10.1016/j.jclinepi.2019.10.011>
- Porzucki, N. (2014). *How did English become the language of science?* The World from PRX. <https://www.pri.org/stories/2014-10-06/how-did-english-become-language-science>
- Ramirez-Castañeda, V. (2020). Disadvantages in preparing and publishing scientific papers caused by the dominance of the English language in science: The case of Colombian researchers in biological sciences. *PLOS ONE*, 15(9), Article e0238372. <https://doi.org/10.1371/journal.pone.0238372>
- Rymer, R. (2012). *Vanishing voices*. National Geographic. <https://www.nationalgeographic.com/magazine/article/vanishing-languages>
- Stenius, K., Obot, I., Kerr-Côrrea, F., Furtado, E. F. & Babor, T. (2008). Beyond the Anglo-American world: Advice for researchers from developing and non-English-speaking countries. In T. F. Babor, K. Stenius, R. Pates, M. Miovský, J. O'Reilly & P. Candon (Eds.), *Publishing addiction science: A guide for the perplexed* (pp. 71–88). Ubiquity Press.
- Tardy, C. (2004). The role of English in scientific communication: Lingua franca or tyrannosaurus rex? *Journal of English for Academic Purposes*, 3(3), 247–269. <https://doi.org/10.1016/j.jeap.2003.10.001>
- Thakuria, B. & Saikia, P. (2016). Predatory publisher and impact factor: The murky landscape of scholastic publication. *Indian Journal of Medical Microbiology*, 34(3), 392–393. <https://doi.org/10.4103/0255-0857.188372>
- The R User Conference. (2021). *Preparing for an accessible online conference* [Blog post]. / blog/2021/02/17/preparing-for-an-accessible-conference/
- Tollefson, J. (2018). China declared world's largest producer of scientific articles. *Nature*, 553(7689), 390–390. <https://doi.org/10.1038/d41586-018-00927-4>
- Van Leeuwen, T. N., Moed, H. F., Tijssen, R. J. W., Visser, M. S. & Van Raan, A. F. J. (2001). Language biases in the coverage of the Science Citation Index and its consequences for international comparisons of national research performance. *Scientometrics*, 51(1), 335–346. <https://doi.org/10.1023/A:1010549719484>
- van Weijen, D. (2012). *The language of (future) scientific communication*. Research Trends. <https://www.researchtrends.com/issue-31-november-2012/the-language-of-future-scientific-communication/>
- Wikipedia. (2021). *Superpower collapse*. Wikipedia. https://en.wikipedia.org/w/index.php?title=Superpower_collapse&oldid=1026443893
- Xu, B., Meng, H., Qin, S., Liu, Y., Li, Z. & Cao, J., Lin, Y., Zhang, Y., & Wang, Z. (2019). How international are the editorial boards of leading spine journals? A STROBE-compliant study. *Medicine*, 98(5), Article e14304. <https://doi.org/10.1097/MD.00000000000014304>