Academic publishing requires linguistically inclusive policies

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Keywords: Language barriers, academic publishing, inclusivity, biological sciences, society journals.

Abstract

Scientific knowledge is produced in multiple languages but is predominantly published in English. This academic publishing practice creates a language barrier to the generation and transfer of scientific knowledge between communities with diverse linguistic backgrounds, hindering the ability of scholars and communities to address global challenges and achieve diversity and equity in science, technology, engineering, and mathematics (STEM). To overcome those barriers, publishers and journals should provide a fair system that supports non-native English speakers and disseminates knowledge across the globe. We surveyed policies of 736 journals in biological sciences to assess their linguistic inclusivity, identify predictors of inclusivity, and propose actions to overcome language barriers in academic publishing. Our assessment revealed a grim landscape where most journals were making minimal efforts to overcome language barriers in academic publishing. The Impact Factor of journals was negatively associated with the adoption of a number of inclusive policies whereas the ownership by a scientific society tended to have a positive association. Counter to our expectations, the linguistic diversity of editorial boards and the Open Access model did not have a major positive association with the adoption of linguistically inclusive policies. We proposed a set of actions to overcome language barriers in academic publishing, including the revision of exclusionary practices, clear communication of linguistic policies in author guidelines, and renegotiation of power dynamics between publishers and editorial boards. Academic publishing requires a change to support scholars and communities with limited English proficiency and scientific societies are well positioned to lead this cultural shift.

Significance Statement

The dominant use of English seriously impedes the fair participation of non-native English speakers in science and transfer of knowledge across the globe. Journals play an irreplaceable role in addressing this issue. We surveyed policies of 736 journals in biological sciences and found that most journals make minimal efforts to overcome such language barriers in academic publishing. Society-owned journals were more likely to have policies that are inclusive for non-native English speakers and promote the multilingualization of scientific knowledge. By providing a set of actions that can be implemented by journals, this article will raise awareness about linguistic equity in academic publishing and urge publishers and journals to act immediately to overcome those barriers.

Introduction

Sharing scientific knowledge across the globe is key to addressing many global challenges and achieving Sustainable Development Goals (Target 17.6). Yet circulation of scientific knowledge

remains geographically restricted. The academic publishing culture has created a language barrier for knowledge transfer, where scientific knowledge is produced in multiple languages but hegemonically pushed to be published in English. Consequently, scholars from countries where English is not widely spoken expend more cost and effort when publishing in English than scholars from countries where English dominates (1-3). They also face the dilemma of achieving global visibility by publishing their work in English or making their work accessible to local communities by publishing in their native language. This tradeoff hinders the ability of scholars and communities to address both regional and global issues, such as the conservation of biodiversity (4). It also hampers efforts to achieve diversity and equity in STEM.

Overcoming language barriers in STEM requires publishing policies that meet the needs of scholars who are non-native English speakers and that facilitate the transfer of scientific knowledge between communities with diverse linguistic backgrounds (5). As gatekeepers of scientific knowledge, academic publishers and journals are responsible for providing a fair system that supports non-native English speakers and disseminates knowledge across geographic and linguistic borders. However, individual publishers and journals have different values, incentives, and resources to strive towards linguistic inclusivity.

Linguistically inclusive policies

Journals can support scholars who are not native English speakers in a variety of ways throughout all stages of the editorial process (5). Here, we present some linguistically inclusive policies that journals in all fields of STEM should consider to support authors and readers from diverse linguistic backgrounds. *i*) *Language of manuscripts*: Publishing manuscripts and abstracts in other relevant languages would enhance the accessibility of scientific knowledge to communities in countries where English is not widely spoken. *ii*) *Linguistic inclusivity statement*: A public statement declaring that manuscripts will be fairly assessed regardless of the perceived standard of English would signal the commitment of journals to overcome language barriers. *iii*) *Language of guidelines*: Providing author guidelines in multiple languages would assist authors in the preparation of their manuscripts and further signal that the journal values submissions from authors based in regions where English does not dominate. *iv*) *Non-English-language references*: Non-English-language literature can provide unique information, and encouraging authors to use this resource would enable comprehensive and globally relevant research not possible when only citing English-language literature (6,7). *v*) *English editing services*: Helping authors to improve the readability of their manuscripts through English-language mentoring programs or commercial English editing services free of charge to authors would improve the editorial experience for authors, reviewers, and editors. *vi*) *Linguistic instructions to reviewers and editors*: Instructing both reviewers and editors to be aware of language biases and assess manuscripts based on their research attributes alone would contribute to a fairer assessment of manuscripts from authors that are non-native English speakers. *vii*) *Machine translation tools*: Implementing machine translation tools would improve the accessibility of published papers for non-native English-speakers (8). This is a non-exhaustive list and additional linguistically inclusive policies will complement the efforts of journals to overcome language barriers in academic publishing.

We surveyed practices and policies of 736 journals in biological sciences to assess their linguistic inclusivity, identify predictors of inclusivity, and highlight areas where publishers and journals can take action to increase diversity and equity in STEM. We examined the author guidelines of journals to assess the inclusivity of their policies, and also surveyed editors-in-chief to capture journal policies that are not apparent from author guidelines. Among the predictors that we

assessed are the Impact Factor of the journal, proportion of Open Access articles, linguistic diversity of editorial boards, and ownership by a scientific society.

Results and Discussion

Panorama of linguistic policies

Our assessment of author guidelines and surveys to editors-in-chief revealed that most journals are making minimal efforts to overcome language barriers in publishing (Figure 1). As of late-2021, less than 7% of the journals included in this study allowed authors to publish articles in languages other than English. In the limited cases where journals allowed for publishing articles in additional languages, Spanish and French were the languages most frequently allowed. Publishing abstracts in an additional language was permitted by 33% of the journals according to editors-in-chief, but only 18% of all journals mentioned this possibility in their author guidelines. Only two of the 736 journals stated that manuscripts would not be rejected solely on the grounds of the perceived English standard and just 8% had their complete author guidelines accessible in at least one additional language, predominately Spanish. Although most editors-in-chief indicated that they allow or encourage citing non-English-language references, only 10% of the journals explicitly mentioned this in the author guidelines. Nearly half of the editors-in-chief considered free English-editing services to entail grammatical corrections or directing authors to English-language tutorials, yet only 1% of the journals offered in-depth assistance to authors through English-language mentoring programs free of charge. Furthermore, only 6% and 4% of the journals instructed their reviewers and editors, respectively, to avoid assessing manuscripts solely based on the perceived English quality. Only 11% of the journals, most of which were archived on *BioOne Complete*, implemented machine translation tools on their websites. Overall, journal support for non-native English-speaking authors and readers was limited and, in some instances, author guidelines did not reflect the intentions of editors-in-chief to assist authors during the editorial process.

Predictors of linguistic inclusivity

Impact Factor, which is commonly perceived as a proxy of prestige, is non-randomly distributed among journals with different geographic origins and scopes in our dataset. For instance, journals that were published in countries where English is not widely spoken or aimed at a regional readership tended to have a lower Impact Factor than journals published in English-speaking countries or aimed at a global readership. Moreover, non-English publications get less citations and, hence, a lower Impact Factor than English publications (9). Because of these intertwined factors, Impact Factor can be associated either positively or negatively with the adoption of linguistically inclusive policies. Our results showed that higher Impact Factor journals were more likely to refer authors to commercial English-editing services than lower Impact Factor journals. This practice appears to be associated with the publishers' business model; higher Impact Factor journals tended to be published by for-profit publishers, which advertised their own, or their commercial partners', English-editing services. Higher Impact Factor journals were, however, more likely to have reviewer and editor instructions about the importance of linguistically inclusive assessment of manuscripts. Despite this, higher Impact Factor journals were less likely to publish manuscripts and abstracts in non-English languages, allow or encourage citing non-English-language references, and implement machine translation tools on their websites. This indicates that higher Impact Factor journals implicitly target an English-proficient readership only.

Open Access publishing is generally perceived as a move towards inclusivity in STEM as it improves access to published scientific knowledge. However, our findings reveal that Open Access is not necessarily a key predictor of linguistic inclusivity in journals. Open Access had a significant association only with the use of non-English-language references, where the editors-

in-chief of journals with a higher proportion of Open Access articles were more likely to allow or encourage them. This finding, along with the fact that the cost of Open Access publishing represents a major barrier for scholars from lower-income countries (10), casts doubts on the contribution of Open Access models to reducing disparities in the global dissemination of scientific knowledge.

The linguistic diversity of editorial boards may also be viewed as a driver of inclusivity in journals, since editors who have faced language barriers in their own career may be more aware of the impacts of such barriers. However, linguistically diverse editorial boards were positively associated only with the provision of author guidelines in multiple languages. In contrast, journals with linguistically diverse editors were less likely to publish abstracts in non-English languages, offer English editing services, and implement machine translation on their websites. This apparent paradox might reflect a lack of power of editorial boards to shape a journal's linguistic policies. For instance, in economics, some major publishers have set general English language use policies for all their journals (11). Alternatively, editors who have overcome language barriers might endorse established practices as a way to attain acceptance within a dominant scientific community and circumvent criticism from colleagues for promoting "disruptive" policies (12).

Ownership by a scientific society was the clearest positive predictor of linguistic inclusivity in scientific publishing. Society journals were more likely to publicly allow or encourage citing non-English-language references, instruct editors to assess the manuscripts regardless of the perceived English standard, and implement machine translation tools on their websites. Furthermore, society journals preceded, for several years, non-society journals in allowing the publication of non-English content (Figure 2). As organizations with the capacity to define disciplinary norms and shape culture within academic communities (13,14), scientific societies are uniquely positioned to reform academic publishing towards linguistic inclusivity. Societies' greatest assets are their membership. Therefore, they have the responsibility to revise discriminatory practices and commit resources that support greater opportunities for members from historically marginalized groups including scholars with limited English proficiency. Furthermore, membership can also be a driver of change towards inclusivity by establishing the foundation of English-mentoring programs offered to potential authors of society journals (5).

A roadmap to overcome language barriers in academic publishing

To promote equitable participation of historically marginalized groups in STEM and maximize the dissemination of scientific knowledge across the globe, academic publishing must undergo a cultural change (5). Scientific societies demonstrably can play a critical role in fostering cultural shifts and we advocate to support community-led initiatives aimed at overcoming language barriers in STEM. For instance, since we collected the information examined this study (November 2021), the Society for the Study of Evolution launched an English language mentoring program to support authors upon submission to *Evolution* (April 2022) and the British Ecological Society integrated artificial intelligence (AI) proofreading tools into the *Journal of Ecology*'s submission system free of charge to authors (November 2022). Similarly, the Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology started to accept manuscript submissions in Spanish and Portuguese in the *EcoEvoRxiv* pre-print server (April 2023).

Beyond the adoption of the linguistically inclusive policies described in this study, we propose a set of actions that can further advance journals in this mission: *i*) Journals should scrutinize and revise author guidelines to communicate their linguistic policies in a clear manner and reconcile author guidelines with the perception of editors (5,15). *ii*) The use of discriminatory language in author guidelines and arbitrary requests against authors with limited English proficiency should be strongly discouraged (11). Those exclusionary practices, such as requesting certificates of professional English-editing services, could impose a significant economic burden to scholars from lower-income countries. *iii*) Authors should be allowed to harness AI tools, such as ChatGPT

or DeepL Write, to proofread their manuscripts and submit both the original and AI-proofread versions for the sake of transparency (16). *iv*) Scholars, editors, and scientific societies should keep assessing the power dynamics between publishers and journal editorial boards in the development of linguistically inclusive policies and promote their renegotiation in the instances where it is deemed necessary. Finally, *v*) journals should implement mandatory double-blind peer review systems to procure a fair assessment of manuscripts regardless of the English proficiency of the authors (3).

Overcoming language barriers in academic publishing is feasible and necessary, but it requires an understanding of the issues faced by scholars with limited English proficiency and a firm commitment from publishers, journals, and scientific societies to develop and implement linguistically inclusive policies. This is a pressing issue to address global challenges such as the biodiversity crisis (4), yet journals in the biological sciences currently fall short in their policies and practices to foster multilingual communities in STEM. We urge academic publishers and journals to revise their policies to identify any linguistic discrimination, educate themselves on scientific evidence related to language barriers (4-6) and the experience of their readers and potential authors (1), and commit resources to implementing linguistically inclusive policies.

Materials and Methods

Selection of journals and predictor variables

We examined the *2020 Journal Citation Reports™* from *Clarivate Analytics* and selected all the journals listed under the following disciplines: Biodiversity Conservation, Ecology, Entomology, Evolutionary Biology, Ornithology, Plant Sciences, and Zoology. We also added to our sample six transdisciplinary journals that regularly publish articles in biological sciences: *Nature*, *Science*, *PNAS*, *PLOS Biology*, *Current Biology*, and *eLife*. To assess what predictors might have contributed to the adoption of linguistically inclusive policies, we collected the following information from the *2020 Journal Citation Reports™* for each journal: Discipline, Impact Factor, percentage of Open Access articles, publication frequency (issues per year), and country of publication. We further searched in the journals' website for information about whether the journal was owned by a scientific society, whether the journal aimed at a global or regional readership, and whether the journal was self-published or published by either a for-profit or non-profit organization.

To test for the contribution of additional predictors related to the language spoken in the regions where either the journals were published or the editors were based in, we used information from (17) to categorize countries as either English-speaking or non-English-speaking. We only scored a country or territory as English-speaking if their most widely spoken language was English. We estimated the proportion of editors whose primary institution of affiliation was in non-English-speaking countries as a proxy of the linguistic diversity of editorial boards. Whereas we acknowledge that this metric does not necessarily reflect whether the editors are native English-speakers or not, we expect that scholars working in regions where English is not predominantly spoken are well aware of the struggles associated with practicing science in languages other than English.

Data collection

We collected all the information used in this study from the journals' websites, author guidelines, and enquiries to editors-in-chief between September 2 and November 22, 2021. Each co-author of this study collected information for a subset of journal titles following a data collection protocol. One person compiled and cleaned the databases, cross-checking the information in the instances where an observation was deemed odd, ambiguous, or absent. We categorized the different

policies and practices depending on what stage of the editorial process they affect (see Supporting Information).

Data analysis

We conducted regression analysis using only four predictor variables: Impact Factor, Open Access, linguistic diversity of editors, and society ownership. We selected this set of variables because they display the lowest levels of correlation among themselves and, intuitively, they seem natural promoters or antagonists of linguistic inclusivity (see Supporting Information). To test whether the predictor variables contributed to the adoption of linguistically inclusive policies and practices, we conducted regression analysis for each question and dataset separately. For questions with two-level answers (binomial), we fitted a logistic regression model. For the guidelines dataset, we conducted the analysis in a mixed effect logistic regression framework to include the identity of the collaborator as a random effect and, thus, account for potential biases in data collection. For questions with three-level answers, we fitted an ordinal logistic regression model. The curated datasets used in these analyses are archived on Zenodo (DOI 10.5281/zenodo.7828391) at https://doi.org/10.5281/zenodo.7828391.

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Figures and Tables

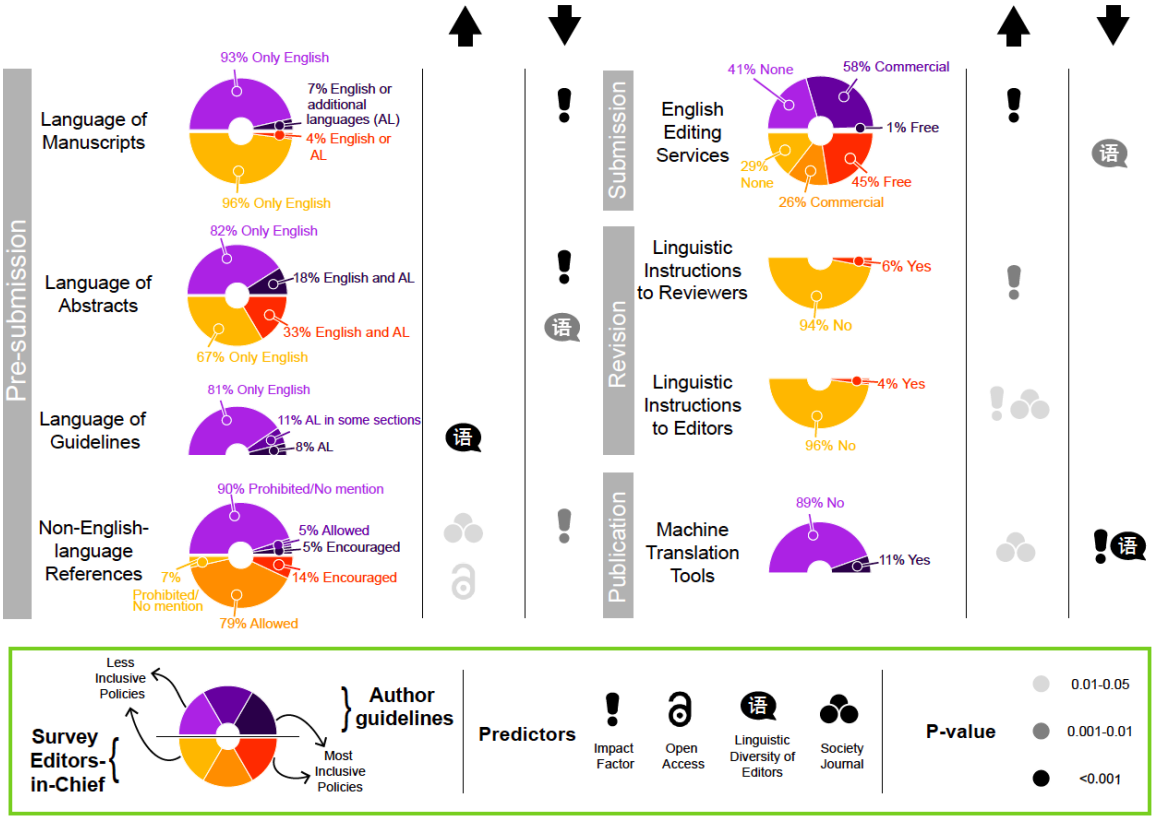

Figure 1. Linguistic policies of journals as communicated in author guidelines (N=736, the upper half of the donut) and answered in our survey by editors-in-chief (N=262, the lower half) alongside the predictors that are associated either positively (upward arrow) or negatively (downward arrow) with the level of linguistic inclusiveness in policies.

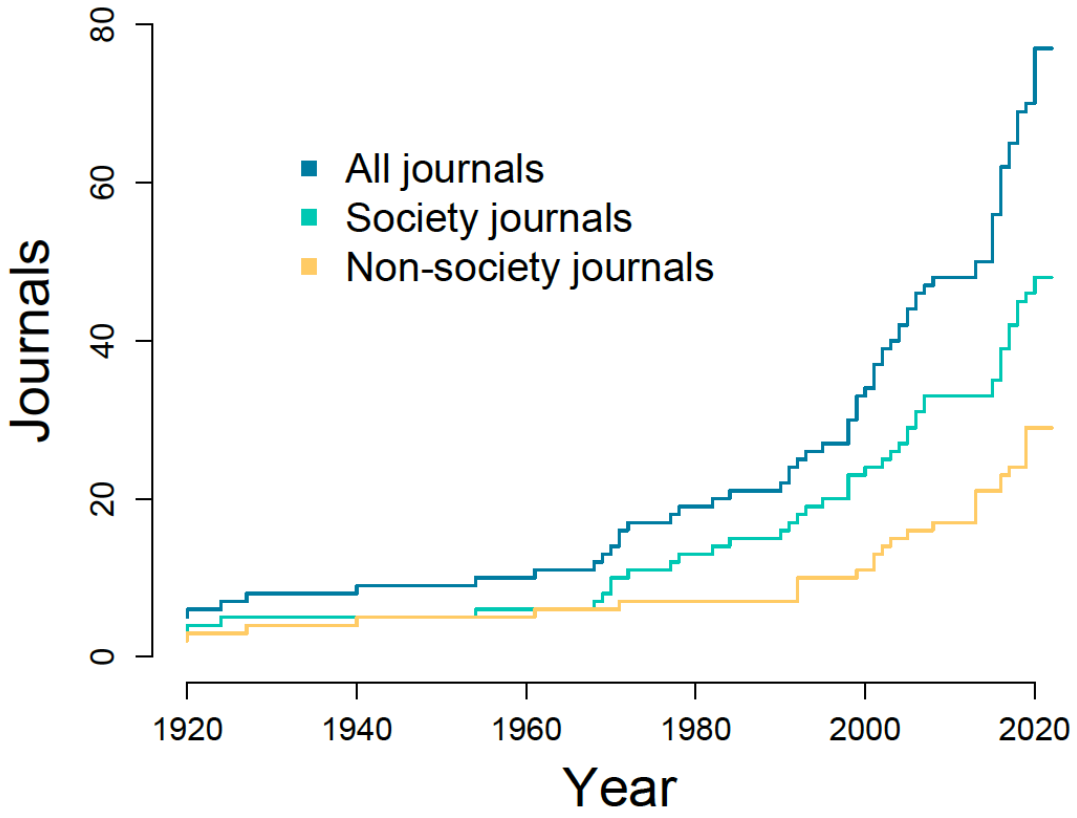

Figure 2. Cumulative plot of the year in which journals started to publish content in languages other than English. Information is based on answers by editors-in-chief in our survey (N=77). Five journals adopted those policies before 1920.

Supporting Information

Multilingual summaries

Resumen

La publicación académica necesita políticas de inclusión lingüística

El conocimiento científico se produce en múltiples idiomas, pero se publica predominantemente en inglés. Esta práctica de publicación académica crea una barrera lingüística para la transferencia de conocimientos científicos entre comunidades con diferencias lingüísticas. Esto a su vez impide a académicos y comunidades responder a desafíos globales y alcanzar diversidad y equidad en la ciencia, tecnología, ingeniería y matemáticas (STEM). Para superar estas barreras, las editoriales y revistas deben ofrecer un sistema justo que difunda conocimiento más allá de fronteras geográficas y lingüísticas. Estudiamos las prácticas y políticas de 736 revistas de ciencias biológicas para *i*) evaluar su inclusividad lingüística, *ii*) identificar variables predictoras de inclusividad y *iii*) destacar áreas en las que las editoriales y revistas pueden tomar medidas para aumentar la diversidad y equidad en STEM. Algunas de las políticas que evaluamos fueron la publicación de contenido en varios idiomas, el apoyo a autores a través de servicios de edición en inglés, los lineamientos para que revisores y editores sean conscientes de sesgos lingüísticos, la citación de referencias en varios idiomas y la implementación de herramientas de traducción automática en los sitios web. Nuestra evaluación reveló un panorama sombrío en el que la mayoría de las revistas están haciendo pocos esfuerzos para superar barreras lingüísticas en la publicación académica. El factor de impacto de las revistas se asoció negativamente con la adopción de varias políticas inclusivas, mientras que la pertenencia a una sociedad científica se asoció positivamente. Contrario a nuestras expectativas, la diversidad lingüística de los comités editoriales y el modelo de acceso abierto no presentaron una asociación positiva importante con la adopción de políticas lingüísticamente inclusivas. Proponemos un conjunto de acciones para superar las barreras lingüísticas en la publicación académica. Algunas de ellas son la revisión de prácticas excluyentes, comunicación clara de las políticas lingüísticas en las instrucciones para autores y la renegociación de dinámicas de poder entre editores y comités editoriales. La publicación académica requiere un cambio para apoyar a académicos y comunidades con un dominio limitado del inglés y las sociedades científicas están bien posicionadas para liderar este cambio cultural.

Souhrn

Akademické publikování vyžaduje jazykově inkluzivní opatření

Vědecké poznatky jsou publikovány v různých jazycích, ale převážně v angličtině. Tato akademická publikační praxe vytváří jazykovou bariéru pro přenos vědeckých poznatků mezi komunitami s různým jazykovým zázemím, což brání schopnosti vědců a komunit řešit globální výzvy a dosáhnout rozmanitosti a rovnosti v oblasti vědy, technologií, inženýrství a matematiky (STEM). K překonání těchto bariér by vydavatelé a časopisy měly poskytnout spravedlivý systém, který šíří znalosti napříč geografickými a jazykovými hranicemi. Provedli jsme průzkum postupů a opatření 736 časopisů v oblasti biologických věd s cílem *i*) posoudit jejich jazykovou inkluzivitu, *ii*) identifikovat prediktory inkluzivity a *iii*) upozornit na oblasti, v nichž mohou vydavatelé a časopisy přijmout opatření ke zvýšení diverzity a rovnosti v STEM. Mezi opatření, které jsme hodnotili, patřilo zveřejňování obsahu ve více jazycích, pomoc autorům prostřednictvím služeb pro korekturu angličtiny, poučení recenzentů a editorů, aby si byli vědomi jazykových zkreslení, citování zdrojů ve více jazycích a zavedení nástrojů pro strojový překlad na webových stránkách. Naše hodnocení odhalilo neradostnou situaci, kdy většina časopisů vyvíjí minimální úsilí k překonání jazykových bariér v akademickém publikování. Impakt faktor časopisů byl negativně

asociován s přijetím řady inkluzivních opatření, zatímco vlastnictví časopisu vědeckou společností mělo spíše pozitivní vliv. V rozporu s naším očekáváním neměla jazyková rozmanitost redakčních rad a publikační model s otevřeným přístupem (open access) významnější pozitivní souvislost s přijetím jazykově inkluzivních opatření. Navrhli jsme soubor opatření k překonání jazykových bariér v akademickém publikování. Některá z nich zahrnují revizi neinkluzivních praktik, jasné sdělení jazykových praktik v pokynech pro autory a opětovné přerokování mocenské dynamiky mezi vydavateli a redakčními radami. Akademické publikování vyžaduje změnu podporující vědce a komunity s omezenou znalostí angličtiny a vědecké společnosti mají dobré předpoklady k tomu, aby tuto kulturní změnu vedly.

Zhrnutie

Akademické publikovanie vyžaduje jazykovo inkluzívne opatrenia

Vedecké poznatky sú publikované v rôznych jazykoch, ale väčšinou v angličtine. Táto prax akademického publikovania vytvára jazykovú bariéru pri prenose vedeckých poznatkov medzi komunitami s rôznym jazykovým zázemím, čo bráni schopnosti vedcov a komunít riešiť globálne výzvy a dosiahnuť rozmanitosť a rovnosť v oblasti vedy, techniky, inžinierstva a matematiky (STEM). Na prekonanie týchto bariér by vydavatelia a časopisy mali poskytnúť spravodlivý systém, ktorý by šíril poznatky naprieč geografickými a jazykovými hranicami. Uskutočnili sme prieskum postupov a opatrení 736 časopisov v oblasti biologických vied s cieľom (*i*) posúdiť ich jazykovú inkluzivitu, (*ii*) identifikovať prediktory inkluzivity a (*iii*) poukázať na oblasti, v ktorých môžu vydavatelia a časopisy prijať opatrenia na zvýšenie rozmanitosti a rovnosti v STEM. Medzi hodnotené opatrenia patrilo publikovanie obsahu vo viacerých jazykoch, pomoc autorom prostredníctvom služieb na korekturu angličtiny, poučenie recenzentov a redaktorov, aby si boli vedomí jazykových skreslení, citovanie zdrojov vo viacerých jazykoch a zavedenie nástrojov na strojový preklad na webových stránkach. Naše hodnotenie odhalilo neradostnú situáciu, keď väčšina časopisov vynakladá minimálne úsilie na prekonanie jazykových bariér v akademickom publikovaní. Impakt faktor časopisov bol negatívne asociovaný s prijatím viacerých inkluzívnych opatrení, zatiaľ čo vlastníctvo časopisu vedeckou spoločnosťou malo skôr pozitívny vplyv. V rozpore s našimi očakávaniami jazyková rozmanitosť redakčných rád a publikačný model s otvoreným prístupom (open access) nemali významnú pozitívnu súvislosť s prijatím jazykovo inkluzívnych opatrení. Navrhli sme súbor opatrení na prekonanie jazykových bariér v akademickom publikovaní. Niektoré z nich zahŕňajú revíziu neinkluzívnych postupov, jasnú komunikáciu jazykových praktík v pokynoch pre autorov a opätovné prerokovanie mocenskej dynamiky medzi vydavateľmi a redakčnými radami. Akademické publikovanie si vyžaduje zmeny, ktoré podporia vedcov a komunity s obmedzenou znalosťou angličtiny, a vedecké spoločnosti majú dobrú pozíciu na to, aby viedli túto kultúrnu zmenu.

Riassunto

L'editoria accademica necessità di politiche di inclusione linguistica

La conoscenza scientifica è prodotta in più lingue, ma viene pubblicata prevalentemente in inglese. Questa pratica editoriale crea una barriera linguistica al trasferimento delle conoscenze scientifiche tra comunità che parlano lingue diverse, ostacolando la capacità degli studiosi e delle comunità di affrontare le sfide globali e di raggiungere la diversità e l'equità nella scienza, nella tecnologia, nell'ingegneria e nella matematica (STEM). Per superare queste barriere, gli editori e le riviste dovrebbero fornire un sistema equo che diffonda le conoscenze superando i confini geografici e linguistici. In questo lavoro, abbiamo analizzato le pratiche e le politiche editoriali di 736 riviste legate alle scienze biologiche per *i*) valutare la loro inclusività linguistica, *ii*) identificare i fattori predittivi dell'inclusività, ed *iii*) evidenziare le aree in cui gli editori e le riviste potrebbero intervenire per aumentare la diversità e l'equità nelle discipline STEM. Alcune delle politiche che abbiamo valutato includevano la pubblicazione di contenuti in più lingue, l'assistenza fornita agli autori attraverso servizi di revisione in inglese, l'istruzione di revisori ed editori perché siano più

consapevoli dei pregiudizi linguistici, la possibilità di inserire citazioni bibliografiche in più lingue e l'implementazione di strumenti di traduzione automatica nei siti web delle riviste. La nostra indagine ha rivelato un panorama desolante in cui la maggior parte delle riviste compie sforzi minimi per superare le barriere linguistiche nell'editoria accademica. Il Fattore d'impatto (Impact Factor) delle riviste è risultato essere associato negativamente all'adozione di una serie di politiche inclusive, mentre la proprietà delle riviste da parte di società scientifiche tende ad essere associato positivamente con una maggiore inclusività. Contrariamente alle nostre aspettative, la diversità linguistica dei comitati editoriali e il modello Open Access non sono risultate associate positivamente con l'adozione di politiche inclusive dal punto di vista linguistico. Proponiamo quindi una serie di azioni per superare le barriere linguistiche nell'editoria accademica. Alcune di queste includono la revisione delle pratiche di esclusione, la comunicazione chiara delle politiche linguistiche nelle linee guida per gli autori e la rinegoziazione delle dinamiche decisionali tra case editrici e comitati editoriali. L'editoria accademica ha bisogno di un cambiamento per sostenere gli studiosi e le comunità con una conoscenza limitata dell'inglese e le società scientifiche sono nella posizione ideale per guidare questo cambiamento culturale.

Streszczenie

Publikacje akademickie powinny być językowo inkluzyjne

Wiedza naukowa jest tworzona w wielu językach, ale publikowana jest głównie w języku angielskim. Ta akademicka praktyka wydawnicza stwarza barierę językową w przekazywaniu wiedzy naukowej między społecznościami o różnym pochodzeniu językowym, utrudniając naukowcom i społecznościom wspólne stawianie czoła globalnym wyzwaniom. Równocześnie, ogranicza reprezentatywność, różnorodność i równość w naukach ścisłych i przyrodniczo – techniczno – matematycznych (STEM). Aby pokonać te bariery, wydawcy i czasopisma powinni zapewnić sprawiedliwy system rozpowszechniania wiedzy ponad granicami geograficznymi i językowymi. Przebadaliśmy praktyki i politykę 736 czasopism z dziedziny nauk biologicznych, aby *i*) ocenić ich inkluzywność językową, *ii*) zidentyfikować wskaźniki inkluzywności oraz *iii*) wskazać obszary, w których wydawcy i czasopisma mogłyby podjąć działania w celu zwiększenia różnorodności i dostępności w STEM. Niektóre z analizowanych przez nas praktyk, obejmowały publikowanie treści w wielu językach, pomoc autorom za pośrednictwem usług edycji w języku angielskim, instruowanie recenzentów i redaktorów, aby byli świadomi uprzedzeń językowych, cytowanie odniesień w wielu językach oraz wdrażanie narzędzi do tłumaczenia maszynowego na stronach internetowych. Nasza analiza ujawniła ponury krajobraz, w którym większość czasopism podejmuje minimalne wysiłki w celu przezwyciężenia barier językowych w publikacjach akademickich. Impact Factor czasopism był negatywnie skorelowany ze stosowaniem przez redakcje szeregu praktyk inkluzywnych. Natomiast powiązanie czasopisma z towarzystwem naukowym miało zazwyczaj efekt pozytywny. Wbrew naszym oczekiwaniom różnorodność językowa redakcji i model otwartego dostępu nie miały istotnego związku z przyjęciem praktyk inkluzywnych językowo. Proponujemy zestaw działań mających na celu przezwyciężenie barier językowych w publikacjach naukowych. Niektóre z nich obejmują rewizję praktyk wykluczających, jasne komunikowanie zasad językowych w wytycznych dla autorów oraz renegocjację dynamiki zależności między wydawcami a redakcjami. Publikowanie akademickie wymaga zmian, aby wspierać naukowców i społeczności o ograniczonej znajomości języka angielskiego, a towarzystwa naukowe mają dobrą pozycję, aby tej zmianie kulturowej przewodzić.

概括

学术出版需要具有语言包容性的政策

科学知识以多种语言制造，但主要以英语出版。 这种学术出版实践为在具有不同语言背景的社区之间传播科学知识制造语言障碍，阻碍了学者和社区应对全球挑战以及实现科学、技术、工程和数学 (STEM) 领域的多样性和公平的能力。 为了克服这些障碍，出版商和期刊应该提供一个公平的系统来跨越地理和语言边界传播知识。 我们调查了 736 种生物科学期刊的实践和政策，以 *i*) 评估它们的语言包容性，*ii*) 确定包容性的预测因素，以及 *iii*) 强调出版商和期刊可以采取行动以增强 STEM 多样性和公平性的领域。 我们评估的一些政策包括以多种语言出版内容、通过英语编辑服务为作者提供帮助、指导审稿人和编辑注意语言偏见、以多种语言引用参考文献以及在网站中实施机器翻译工具。我们的评估显示，大多数期刊在克服学术出版中的语言障碍方面微乎其微。 期刊影响因子与采用包容性政策呈负相关，而科学协会所有权趋向正相关。 与预期相反，编辑委员会的语言多样性和开放获取模式与采用语言包容性政策没有重大的积极联系。 我们为克服学术出版中的语言障碍而提出的行动包括修订排他性做法、在作者指南中明确传达语言政策，以及出版商和编辑委员会之间权力动态的重新谈判。 学术出版需要改变，以支持英语水平有限的学者和社区，而科学协会有能力引领这种文化转变。

Résumé

Les publications académiques requirent des politiques d'inclusion linguistique

Les connaissances scientifiques sont produites dans de nombreuses langues, mais elles sont principalement publiées en anglais. Cette pratique de publication académique crée une barrière linguistique pour le transfert des connaissances scientifiques entre les communautés de diverses origines linguistiques, ce qui entrave la capacité des chercheurs et des communautés à relever les défis mondiaux et à respecter la diversité et l'équité dans les sciences, les technologies, l'ingénierie et les mathématiques (STEM). Pour surmonter ces obstacles, les éditeurs et les réviseurs devraient mettre en place un système équitable permettant de diffuser les connaissances au-delà des frontières géographiques et linguistiques. Nous avons étudié les pratiques et les politiques de 736 revues en sciences biologiques pour *i*) évaluer leur inclusivité linguistique, *ii*) identifier les prédicteurs de l'inclusivité et *iii*) mettre en évidence les domaines dans lesquels les éditeurs et les revues peuvent prendre des mesures pour accroître la diversité et l'équité dans le domaine des STEM. Parmi les politiques que nous avons évaluées figurent la publication de contenus en plusieurs langues, l'assistance aux auteurs par le biais de services d'édition en anglais, la sensibilisation des réviseurs et des éditeurs aux préjugés linguistiques, la citation de références en plusieurs langues et la mise en œuvre d'outils de traduction automatique sur les sites web. Notre évaluation a révélé un paysage sombre où la plupart des revues ne font que des efforts minimes pour surmonter les barrières linguistiques dans l'édition universitaire. Le facteur d'impact des revues était négativement associé avec l'adoption d'un certain nombre de politiques d'inclusion, tandis que la propriété par une société scientifique tendait à avoir une association positive. Contrairement à nos attentes, la diversité linguistique des comités de rédaction et le modèle de libre accès n'ont pas eu d'association positive majeure avec l'adoption de politiques d'inclusion linguistique. Nous avons proposé une série d'actions pour surmonter les barrières linguistiques dans l'édition universitaire. Certaines d'entre elles comprennent la révision des pratiques d'exclusion, la communication claire des politiques linguistiques dans les lignes directrices destinées aux auteurs et la renégociation de la

dynamique du pouvoir entre les éditeurs et les comités éditoriaux. L'édition universitaire doit changer pour soutenir les chercheurs et les communautés dont la maîtrise de l'anglais est limitée, et les sociétés scientifiques sont bien placées pour mener ce changement culturel.

まとめ

学術出版には言語的に包括的な方針が必要である

科学的知識は多数の言語によって生成されるが、主に英語で出版される。この学術出版の慣習は、さまざまな言語的背景を持つコミュニティ間で科学的知識を伝達する上での言語障壁を生み出し、学者やコミュニティが地球規模の課題に対処し、科学・技術・工学・数学（STEM）における多様性・公平性を実現することを妨げる。これらの障壁を乗り越えるために、出版社とジャーナルは、地理的・言語的境界を越えて知識を広める公正なシステムを提供すべきである。我々は、生物科学のジャーナル736誌の慣習と方針を調べ、*i*) 言語的包括性を評価し、*ii*) 包括性の予測因子を特定し、*iii*) STEMにおける多様性・公平性を高めるために出版社とジャーナルが対応策を取ることができる領域を明らかにした。我々が評価した方針には、コンテンツの多言語での出版、英語校正サービスを通じた著者への支援、査読者・編集者への言語的偏見に対する注意指示、複数言語での文献引用、ウェブサイトでの機械翻訳ツールの実装が含まれていた。我々の評価では、ほとんどのジャーナルが学術出版における言語障壁を克服するために最小限の努力しか行なっていないという、厳しい状況が明らかになった。ジャーナルのインパクトファクターは多くの包括的な方針と負の相関があった一方で、学会によるジャーナルの所有は正の相関を示す傾向があった。予想に反して、編集委員会の言語的多様性とオープンアクセスモデルは、言語的に包括的な方針と大きな正の相関がなかった。我々は、学術出版における言語障壁を乗り越えるための一連の行動を提案した。その中には、排他的慣習の見直し、著者ガイドラインにおける言語的方針の明確な伝達、出版社と編集委員会の間の力関係の再交渉などがある。学術出版には、英語能力が限られている学者やコミュニティをサポートするための変化が必要であり、学会はこのような文化的転換をリードできる位置を占めている。

Extended Materials and Methods

Data collection

We excluded 26 out of 762 journals for any of the following reasons: *i*) They did not publish content in English (N=3), *ii*) they were a book series (N=3), *iii*) their author guidelines were unavailable in their website (N=3), *iv*) their website was corrupted (N=3), *v*) they were out of the scope of their nominal discipline (N=10), vi) they were out of circulation (N=2), or *vii*) they only allowed submissions from members of a particular organization (N=2).

We categorized the different policies and practices, herein questions, depending on what stage of the editorial process they affect. We briefly describe them here. The information to answer each question could come from either author guidelines (G) or surveys to editors-in-chief (S) or both (see below). Please note the levels of the variable that we considered for hypothesis testing in brackets, where their order goes from least inclusive answers to most inclusive ones.

1. Pre-submission stage
    1.1. (G,S) *Language of manuscripts and abstracts*: Does the journal publish the main text of articles or abstract in languages other than English? [Only English, Additional languages]
        1.1.1. (G) If so, what languages are allowed?
        1.1.2. (S) If so, when did the journal adopt that policy?
        1.1.3. (G) If so, does the journal proofread the non-English content?
        1.1.4. (G,S) If so, in what format is the non-English content published?
        1.1.5. (G,S) What other sections are published in languages other than English?

    1.2. (G) *Linguistic inclusivity statement*: Does the journal state that manuscripts will not be rejected solely based on the perceived quality of English language? [No, Yes]
    1.3. (G) *Language of guidelines*: Are the journal guidelines available in languages other than English? [Only English, Additional languages in some sections, English and additional languages]
        1.3.1. (G) If so, in what languages are they available?
    1.4. (G,S) *Citing non-English references*: Does the journal publish references in languages other than English? [Prohibited/No mention, Allowed, Encouraged]
2. Submission stage
    2.1. (G,S) *English editing services*: What is the most inclusive English language editing service that the journal provides? [None, Commercial, Free]
        2.1.1. (S) If it provides free editing service, at what stage of the publishing process is it offered to authors?
        2.1.2. (G) What other kind of support does the journal provide to authors?
3. Revision stage
    3.1. (S) *Linguistic instructions to reviewers*: Does the journal instruct reviewers to not recommend the rejection of manuscripts solely on the basis of the perceived standard of English language? [No, Yes]
    3.2. (S) *Linguistic instructions to editors*: Does the journal instruct editors to not reject manuscripts solely on the basis of the perceived standard of English language? [No, Yes]
4. Publication stage
    4.1. (G) *Machine translation tools*: Does the journal website provide machine translation tools to read the published articles in other languages?

Author guidelines. We examined the author guidelines of all journals in search of their linguistic policies and practices (Table S1). We also examined other sections of the journal websites to determine whether the journal was owned by a scientific society or whether the published articles could be translated to other languages using machine translation tools. We assumed that a particular policy or practice was lacking if it was not explicitly mentioned. When more than one option applied to a question, we only recorded the most inclusive one. For instance, if a journal both directed authors to commercial English editing services to improve the quality of English language and offered free English-language mentoring services to authors, we only recorded the latter.

Survey to Editors-in-Chief. We designed a survey to enquire to editors about some of the linguistic policies and practices of journals described above. We examined the Editorial Board section of journals websites to identify who was the editors-in-chief and searched for their email address either on the same website or elsewhere (i.e., the website of their institution of affiliation). In the instances where we could not retrieve this information, we searched for the contact details of an editor next in hierarchy (i.e., Senior Editor, Specialty Chief Editor, Handling Editor) or, as a last resource, the Managing Editor or a representative of the editorial office. We emailed a standard message to all editors describing the aims of this study and asking them to complete the survey on behalf of the journal they represented. We also offered them the possibility to delegate this responsibility to other members of the editorial board or editorial office. We sent up to two reminders if the editors did not reply to the original message or complete the survey within two weeks.

The survey was in accordance with the University of Queensland's Institutional Human Research Ethics Approval (2021/HE001813) and was implemented on Qualtrics XM Platform. Here, we present the structure of the survey:

1. Journal name.
2. Does the journal provide any English editing support to authors? Please choose all that apply.
    a. No.
    b. Yes - Journal provides free English editing support.
    c. Yes - Journal provides commercial English editing support.
    d. Yes - Journal provides commercial English editing support at reduced prices.
    e. Yes - Journal directs authors to free English editing support.
    f. Yes - Journal directs authors to commercial English editing support (i.e., service provided by an English editing company).
    g. Yes - Journal directs authors to commercial English editing support at reduced prices (i.e., service provided by an English editing company)
    h. Yes - Other.
    (If "b", "c", "d", "e", "f", or "g") Is the English editing support available for all submitted manuscripts or only for accepted manuscripts?
        i. Submitted
        ii. Accepted
        iii. Other
        (If "iii") Please describe.
    (If "h") Please describe the type of English editing support provided.
3. Does the journal provide any other type of support to authors for improving their English writing (e.g., mentoring or a buddy system)?
    a. Yes.
    b. No.
    (If "a") Please describe it briefly.
4. Does the journal have any written policies/guidelines (e.g., instructions to editors) on how editors should handle manuscripts with poor English writing?
    a. No.
    b. Yes.
    c. Not sure.
    (If "b") What is described in the journal policy/guidelines on how editors should handle manuscripts with poor English? Please select any relevant options.
        i. The editor should describe a specific way for improving English writing.
        ii. The editor should ask the author(s) to have the manuscript checked by a native-English speaker or a professional English editing service.
        iii. The editor can reject a paper if English is poorly written.
        iv. Other.

(If “iv”) Please describe.

5. Does the journal have any written policies/guidelines (e.g., instructions to reviewers) on how reviewers should handle manuscripts with poor English writing?
    a. No.
    b. Yes.
    c. Not sure.
    (If “b”) What is described in the journal policy/guidelines on how reviewers should handle manuscripts with poor English? Please select any relevant options.
        i. The reviewer should not recommend rejecting any paper only due to poor English
        ii. The reviewer should describe a specific way for improving English writing.
        iii. The reviewer should ask the author(s) to have the manuscript checked by a native-English speaker or a professional English editing service.
        iv. The reviewer can recommend rejecting a paper if English is poorly written.
        v. Other.
        (If “v”) Please describe.
6. Does the journal allow or encourage authors to publish the title, abstract, or main text of their English-language papers in a non-English language?
    a. Yes - actively encourages authors to do so (e.g., encouraged in instructions to authors) and it is explicitly stated on the website.
    b. Yes - allows authors to do so if requested.
    c. No.
    d. Other.
    (If “a” or “b”) Please select the manuscript section(s) that the journal allows authors to publish in a non-English language.
        i. Title.
        ii. Abstract.
        iii. Main text.
        iv. Other
        (If “i”, “ii”, or “iii”) Please select the format in which the abstract/title/main text is published in a non-English language.
            A. HTML (i.e., on the journal’s website).
            B. Within PDF.
            C. Within Online Supplementary Information.
            D. Other.
            (If “D”) Please describe.
        (If “iv”) Please describe.
    (If “d”) Please describe.
7. When did the journal start allowing authors to publish the title, abstract or main text of their English-language papers in a non-English language?
8. Does the journal allow or encourage authors to cite non-English-language literature?
    a. Yes - actively encourages authors to do so (e.g., encouraged in instructions to authors) and it is explicitly stated on the website.
    b. Yes - allows authors to do so if requested.
    c. No.
    d. Other.
    (If “d”) Please describe.

Data analysis

We conducted all the analysis of this study on *R v4.2.2* (1). To prevent potential statistical artefacts due to collinearity, we examined the correlation patterns among the proposed predictor

variables (see above) and selected a subset of them that displayed least correlation among themselves for further analyses. For comparisons among pairs of continuous variables, we estimated the Pearson correlation coefficient implemented in the function *pairs.panels* (2). For comparisons among pairs of categorical variables, we conducted Chi-square tests on contingency tables using the function *chisq.test* (1). For comparisons between pairs of continuous and categorical variables, we conducted Kruskal-Wallis tests using the function *kruskal.test* (1).

To test whether the predictor variables contributed to the adoption of linguistically inclusive policies and practices, we conducted regression analysis for each question and dataset separately. We could not test hypotheses on question 1.2 about the linguistic inclusivity statement because variation in responses was insufficient.

For questions with two-level (binomial) answers (questions 1.1; 3.1; 3.2; 4.1), we fitted a logistic regression model. For the guidelines dataset, we conducted the analysis in a mixed effect logistic regression framework to include the identity of the collaborator as a random effect and, thus, account for potential biases in data collection using the function *glmer* (family = binomial, control = glmerControl(optimizer = "bobyqa"), nAGQ = 20) (3). For the survey dataset, we implemented the logistic regression using the function *glm* (family = binomial) (1). Least inclusive answers were coded as 0 and most inclusive answers were coded as 1. For questions with three-level answers (questions 1.3; 1.4; 2.1), we fitted an ordinal logistic regression model implemented in the function *clmm* (link = "logit") (4). We coded the least inclusive answer as 0, the next more inclusive answer as 1, and the most inclusive answer as 2.

Extended Results

Survey of linguistic policies

We collected information from the author guidelines of 736 journals that met our criteria. We also gathered responses from 262 editors (36%) to our survey. Overall, the journals whose editors completed the survey seemed to represent an unbiased sample in terms of the distribution of the values of most predictor variables (Figure S1). However, editors of the journals with the highest IF did not accept our invitation to complete the survey. Conversely, editors of society journals were more likely to complete the survey than editors of non-society journals (X^2_1 = 5.96, P-value = 0.01). Here, we summarize the main findings about the linguistic policies and practices of those journals.

Language of manuscripts and abstracts. Only a small fraction of journals published manuscripts in additional languages to English (7% guidelines; 4% survey), being those languages most commonly restricted to Spanish (N=23) and French (N=16), followed by Portuguese (N=7), Russian (N=7), and German (N=5). Even though some journals adopted those inclusive practices several decades ago, most journals started doing it after 1995 with a pronounced increase since 2016 (Figure 2 of Main Text). Manuscripts in additional languages were rarely proofread (N=11) and they were commonly available in both PDF and online versions (N=24). Conversely, a higher proportion of journals (17% guidelines; 33% survey) published abstracts in additional languages to English.

Linguistic inclusivity statement. Only two out of 736 journals declared in their author guidelines that manuscripts will not be rejected solely based on the perceived quality of English language.

Language of guidelines. The great majority of author guidelines (81%) were available only in English. Only a small fraction of them had translated some sections (11%) or the entire guidelines (8%) to other languages. While author guidelines that were entirely translated to additional languages were most commonly available in Spanish (23 out of 60), the guidelines that were only

partially translated are predominantly available in Mandarin, Japanese, and Korean (68, 63, and 62 out of 80, respectively). We noticed that the translated text tended to correspond to sections where commercial English editing services were advertised.

Non-English-language references. The great majority of journals (90%) either prohibited or did not explicitly mention their policies about the inclusion of references in languages other than English in author guidelines. Only a fraction of them explicitly allowed or encouraged their inclusion (5% each). In contrast, 79% of editors-in-chief answered that their journals allow references in languages other than English and 14% of them encourage them. Only 7% of editors answered that this practice was prohibited.

English editing services. Only 1% of the journals provided information about free English editing services in their author guidelines (*e.g.,* English language mentoring program or special assistance by an English-language editor free of charge). The majority of guidelines either directed authors to commercial English editing services (58%) or did not mention any of such services at all (41%). Conversely, 45% of editors-in-chief considered that their journals offered free English editing services. The other half responded that they directed authors to commercial English editing services (26%) or that their journals did not offer any English editing services (29%). The free English editing services described by the editors-in-chief were mostly offered upon manuscript acceptance (79 out of 117). Additionally to these services, 9% of journals offered links in their author guidelines to free English language use tutorials and online grammar checkers.

Linguistic instructions to reviewers. Only 6% of editors-in-chief responded that their journals instruct reviewers to not recommend the rejection of a paper solely based on the perceived standard of English language.

Linguistic instructions to editors. Only 4% of editors-in-chief responded that their journals instruct editors to not reject a paper solely based on the perceived standard of English language.

Machine translation tools. Only 11% of journals had implemented automatic translation tools in their websites to read published articles in languages other than English.

Identification of predictors

We conducted the regression analysis using only four predictor variables: IF, OA, linguistic diversity of editors, and society ownership. We selected this set of variables because they display the lowest levels of correlation among themselves (Table S2, S3, Figure S2) and, intuitively, they seem natural promoters or antagonists of linguistic inclusivity.

After removing journals with missing data, guidelines dataset comprised 689 titles and survey dataset comprised 249 titles for hypothesis testing purposes. Impact Factor was associated with variation in most questions whereas Open Access was only associated with variation in one question (Table S4). Linguistic diversity of editors and society journals were associated with variation in four and three questions, respectively. Overall, regression coefficients tended to be positive for Open Access and society journals and negative for Impact Factor and linguistic diversity of editors. The curated datasets used in these analyses are archived on *Zenodo* (DOI 10.5281/zenodo.7828391) at https://doi.org/10.5281/zenodo.7828391

Boilerplate linguistically inclusive policies

Here, we summarize the linguistically inclusive policies and practices that we recommend journals to adopt for an easy appreciation of their breadth and scope. Please refer to the main text for more detail.

Pre-submission

- Encouragement of submissions of manuscripts and abstracts in languages other than English.
- Inclusion of a public statement declaring that manuscripts will be fairly assessed regardless of the perceived standard of English.
- Availability of author guidelines in multiple languages.
- Encouragement of the inclusion of non-English-language references.
- Clear communication of linguistic policies that reflect the perception of editors.
- Revision of author guidelines to amend discriminatory language and arbitrary requests against authors with limited English proficiency.
- Permission to harness artificial intelligence tools to proofread manuscripts.
- Assessment and renegotiation of power dynamics between publishers and editorial boards in the development of linguistically inclusive policies.

Submission

- Establishment of English-language mentoring programs or English editing services free of charge to authors.

Revision

- Instructions to reviewers and editors to be aware of language biases and assess manuscripts based on their research attributes only.
- Implementation of mandatory double-blind peer review systems.

Publication

- Implementation of machine translation tools to read papers in multiple languages.

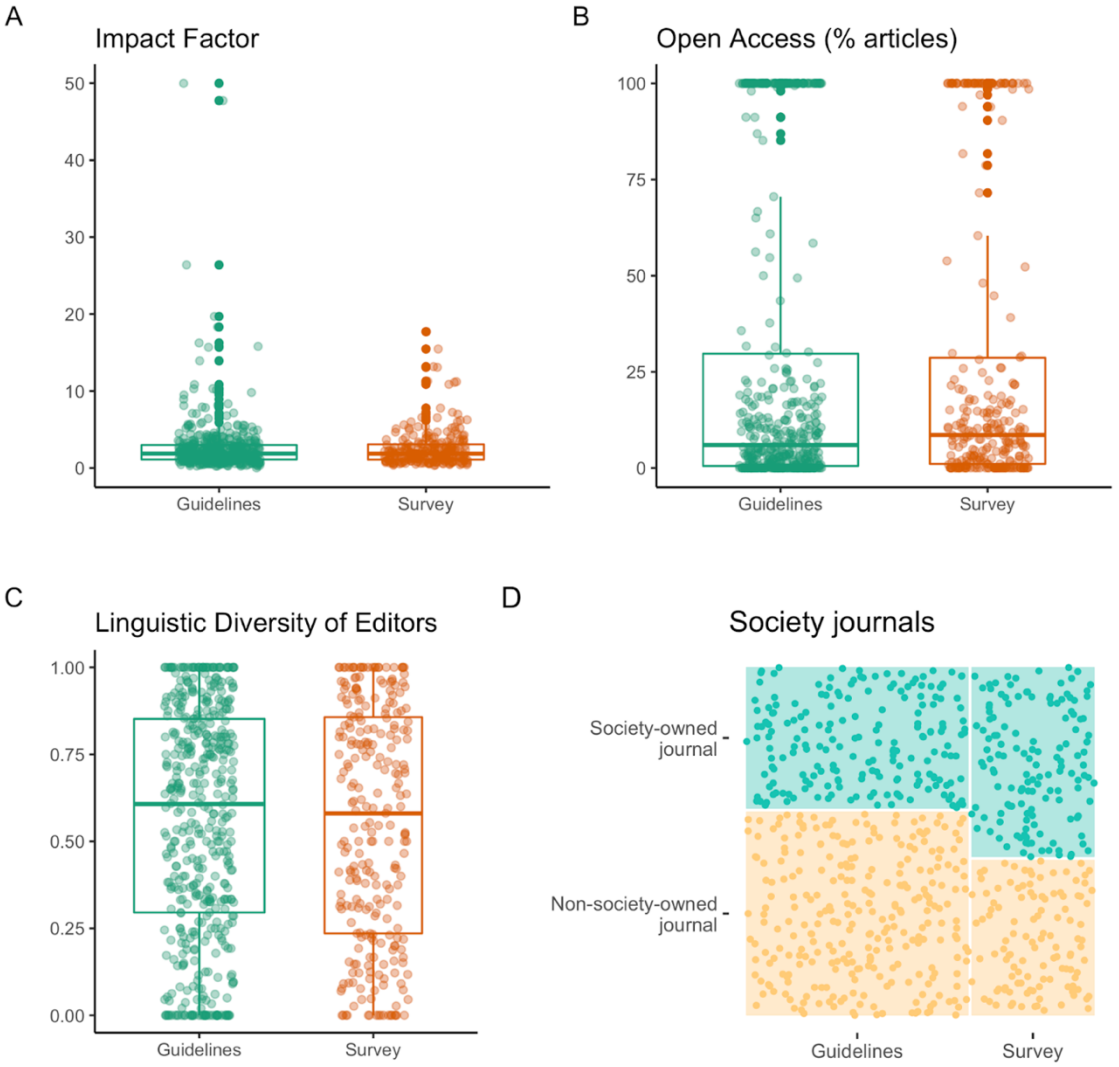

Fig. S1. Distributions of values of selected predictor variables in the author guidelines dataset and the survey to editors dataset. A. Impact Factor. B. Percentage of Open Access articles. C. Proportion of editors based in non-English speaking countries. D. Ownership by a scientific society.

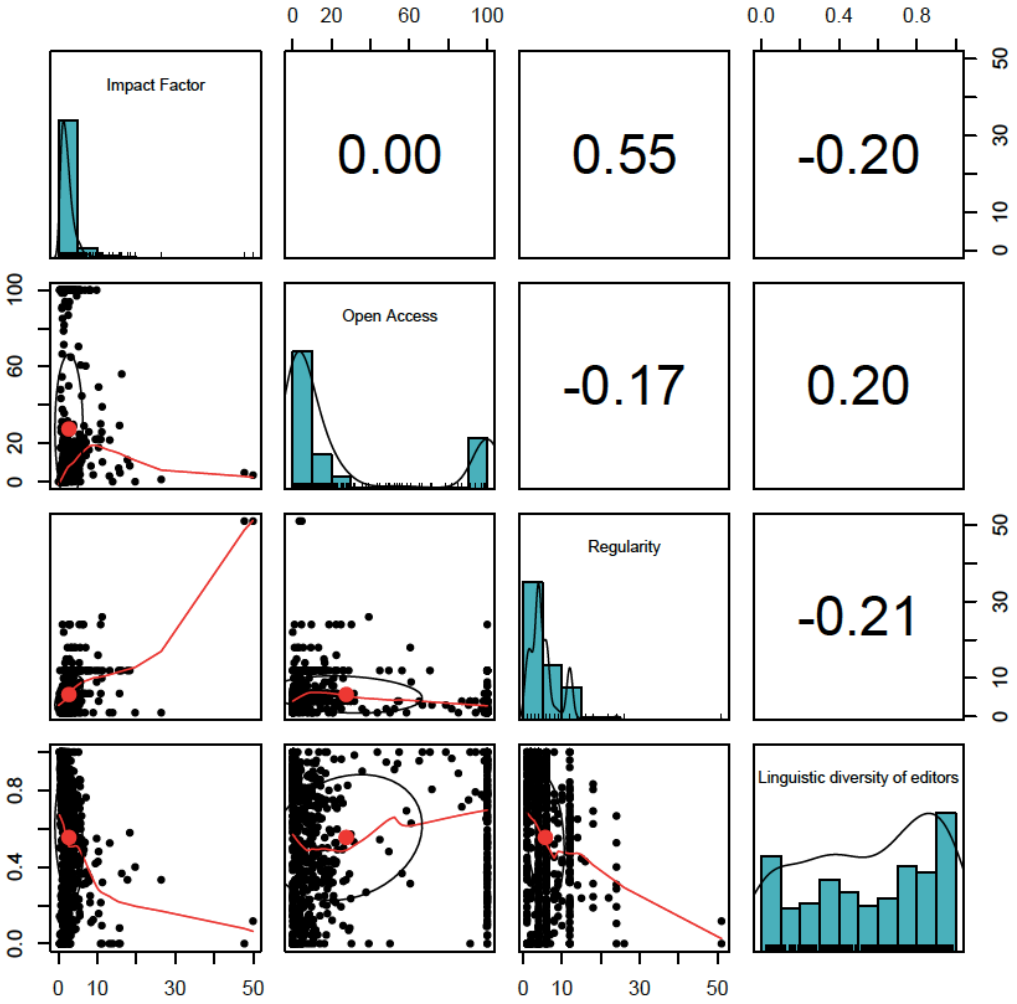

Fig. S2. Patterns of correlations among pairs of continuous predictor variables. The upper half panels display the corresponding Pearson correlation coefficients.

Table S1. Information collected from author guidelines. JCR: as per the *2020 Journal Citation Reports™*.

Variable description	Variable data type and scoring options
Name of collaborator who collected the information	Text
Journal's name (JCR)	Text
Journal's ISSN (JCR)	Text
Journal's eISSN (JCR)	Text
Journal's 2020 Impact Factor (JCR)	Numeric
Percentage of Golden Open Access articles (JCR)	Numeric
Journal's discipline (JCR)	Categorical
Region (country) of publication (JCR)	Categorical
Regularity as number of issues published per year (JCR)	Numeric
Name of journal's publisher (JCR)	Text
Journal's official website link	Text
Date when journal's website was accessed to extract data	Date
Whether the publisher is a commercial company, an university, a museum, another non-profit institution, or a self-published journal	Categorical: PROFIT, UNIVERSITY, MUSEUM, OTHER-NON-PROFIT, SELF-PUBLISHED
Whether the journal is published on behalf of a scientific society	Categorical: YES, NO
What are the official languages of the journal?	Categorical
Is the journal explicitly targeted to a regional audience? If yes, which region? i.e. Neotropical, Austral, Japanese...	Categorical: REGIONAL (region), GLOBAL.
Does the journal provide or direct authors to English editing services? If yes, which service?	Categorical: YES (journal free editing service), YES (journal discounted editing service), YES (journal commercial editing service), YES (external free editing service), YES (external discounted editing service), YES (external commercial editing service), NO, UNCLEAR

Does the journal offer any other support for non-native English scholars, such as a mentoring system?	Categorical: YES (short description), NO
Are the instructions to authors available in a language other than English? If yes, which languages?	Categorical: YES (which language), YES SOME SECTIONS (which language), NO
Does the journal clearly state that a paper will not be rejected solely by the perceived quality of English?	Categorical: YES, NO
Does the journal follow a double blinded peer-review process?	Categorical: YES, NO, UNCLEAR
Does the journal allow to publish a title and abstract in a language other than English? If yes, where is published this content?	Categorical: YES (both online and PDF version), YES (online version only), YES (Supplementary Information only), YES (unclear where), EXPLICITLY NOT ALLOWED, NO-MENTION
Does the journal allow to publish the main text of a manuscript in a language other than English? If yes, where is published this content?	Categorical: YES (both online and PDF version), YES (online version only), YES (Supplementary Information only), YES (unclear where), EXPLICITLY NOT ALLOWED, NO-MENTION
If any part of the manuscript is allowed to be published in a language other than English, is that text proofread?	Categorical: YES, NO, UNCLEAR, NA
Does the journal implement a machine translation tool to assist reading the paper in a language other than English?	Categorical: YES, NO
Does the journal clearly either encourage or prohibit citations of non-English literature?	Categorical: ENCOURAGE, PROHIBIT, NO-MENTION, ALLOW
Number of editors per country (affiliation's country)	Comma-separated text with counts in brackets, e.g., USA (9), Brazil (5), Estonia (1), Japan (1), Australia (1)
Total number of countries where the editors are based in	Numeric

Table S2. Patterns of association among categorical predictor variables assessed with Chi-squared tests.

Predictor variables	Language of country	Publisher type	Geographic scope	Society journal
Discipline	X^2_7 = 35.01 P-value = 1.11e-05	X^2_7 = 26.70 P-value = 3.78e-04	X^2_7 = 6.45 P-value = 4.88e-01	X^2_7 = 36.35 P-value = 6.22e-06
Language of country	NA	X^2_1 = 8.14 P-value = 4.318e-03	X^2_1 = 2.46 P-value = 1.17e-01	X^2_1 = 18.54 P-value = 1.67e-05
Publisher type	NA	NA	X^2_1 = 42.68 P-value = 6.46e-11	X^2_1 = 23.89 P-value = 1.02e-06
Geographic scope	NA	NA	NA	X^2_1 = 0.76 P-value = 3.82e-01

Table S3. Patterns of association between pairs of continuous (columns) and categorical (rows) predictor variables assessed with Kruskal-Wallis tests.

Predictor variables	Impact Factor	Open Access	Linguistic diversity of editors
Geographic scope	X^2_1 = 76.62 P-value < 2.20e-16	X^2_1 = 11.18 P-value = 8.29e-04	X^2_1 = 5.93 P-value = 1.49e-02
Language of country	X^2_1 = 34.76 P-value = 3.73e-09	X^2_1 = 6.00 P-value = 1.43e-02	X^2_1 = 341.93 P-value < 2.20e-16
Society journal	X^2_1 = 2.88 P-value = 8.95e-02	X^2_1 = 7.02 P-value = 8.06e-03	X^2_1 = 7.01 P-value = 8.08e-03

Table S4. Results from regression analyses. Estimated regression coefficients (Est) are on log odds scale. SE are Standard Errors. The intercept values for ordinal models represent the threshold coefficients. G: Guidelines. S: Survey.

Question	Dataset	Model	Intercept	Impact Factor	Open Access	Linguistic diversity of editors	Society journal
Language of manuscripts	G	Binomial	Est = -6.11e-01 SE = 6.72e-01 P-value = 3.64e-01	Est = -2.20 SE = 4.25e-01 P-value = 2.11e-07	Est = 6.45e-03 SE = 5.22e-03 P-value = 2.17e-01	Est = 2.92e-01 SE = 5.86e-01 P-value = 6.18e-01	Est = -3.89e-01 SE = 4.11e-01 P-value = 3.44e-01
	S	Binomial	Est = -4.17 SE = 1.12 P-value = 1.94e-04	Est = 9.83e-02 SE = 1.178e-01 P-value = 4.04e-01	Est = 6.83e-01 SE = 7.54e-01 P-value = 3.65e-01	Est = 1.15 SE = 1.18 P-value = 3.31e-01	Est = -1.50e-01 SE = 6.46e-01 P-value = 8.16e-01
Language of abstracts	G	Binomial	Est = -1.05 SE = 3.19e-01 P-value = 1.05e-03	Est = -2.50e-01 SE = 7.57e-02 P-value = 9.81e-04	Est = 3.41e-03 SE = 2.86e-03 P-value = 2.33e-01	Est = -5.58e-01 SE = 3.32e-01 P-value = 9.26e-02	Est = 2.14e-01 SE = 2.20e-01 P-value = 3.31e-01
	S	Binomial	Est = -6.30e-02 SE = 4.14e-01 P-value = 8.79e-01	Est = -1.02e-01 SE = 6.62e-02 P-value = 1.25e-01	Est = 1.27e-01 SE = 3.89e-01 P-value = 7.43e-01	Est = -1.24 SE = 4.61e-01 P-value = 7.01e-03	Est = 3.81e-01 SE = 2.92e-01 P-value = 1.92e-01
Language of guidelines	G	Ordinal	0|1 = 2.06 SE = 2.94e-01 1|2 = 3.09 SE = 3.14e-01	Est = -1.94e-02 SE = 4.30e-02 P-value = 6.53e-01	Est = 1.32e-03 SE = 2.52e-03 P-value = 5.99e-01	Est = 1.28 SE = 3.41e-01 P-value = 1.72e-04	Est = -3.16e-01 SE = 2.02e-01 P-value = 1.17e-01
Non-English language references	G	Ordinal	0|1 = 2.10 SE = 3.91e-01 1|2 = 2.92 SE = 4.13e-01	Est = -2.99e-01 SE = 1.09e-01 P-value = 5.94e-03	Est = -2.27e-03 SE = 3.55e-03 P-value = 5.22e-01	Est = 5.03e-01 SE = 4.03e-01 P-value = 2.12e-01	Est = 5.16e-01 SE = 2.62e-01 P-value = 4.91e-02

	S	Ordinal	0|1 = -3.18 SE = 5.44e-01 1|2 = 1.50 SE = 4.77e-01	Est = -6.04e-02 SE = 7.01e-02 P-value = 3.88e-01	Est = 1.04 SE = 4.29e-01 P-value = 1.50e-02	Est = -9.95e-01 SE = 5.34e-01 P-value = 6.25e-02	Est = 1.05e-01 SE = 3.31e-01 P-value = 7.52e-01
English editing services	G	Ordinal	0|1 = -4.83e-01 SE = 2.04e-01 1|2 = 4.53 SE = 4.24e-01	Est = 1.10e-01 SE = 2.98e-02 P-value = 2.39e-04	Est = -3.65e-03 SE = 2.08e-03 P-value = 7.90e-02	Est = -2.19e-01 SE = 2.50e-01 P-value = 3.81e-01	Est = -2.51e-01 SE = 1.58e-01 P-value = 1.11e-01
	S	Ordinal	0|1 = -1.54 SE = 3.87e-01 1|2 = -3.58e-01 SE = 3.76e-01	Est = -8.73e-02 SE = 5.00e-02 P-value = 8.06e-02	Est = 3.52e-01 SE = 3.34e-01 P-value = 2.92e-01	Est = -1.26 SE = 4.18e-01 P-value = 2.54e-03	Est = 4.26e-01 SE = 2.49e-01 P-value = 8.71e-02
Linguistic instructions to reviewers	S	Binomial	Est = -3.74 SE = 8.98e-01 P-value = 3.09e-05	Est = 2.29e-01 SE = 7.66e-02 P-value = 2.83e-03	Est = 1.06e-01 SE = 8.56e-01 P-value = 9.02e-01	Est = -5.35e-01 SE = 9.87e-01 P-value = 5.88e-01	Est = 7.40e-01 SE = 6.29e-01 P-value = 2.39e-01
Linguistic instructions to editors	S	Binomial	Est = -5.91 SE = 1.56 P-value = 1.58e-04	Est = 2.55e-01 SE = 1.04e-01 P-value = 1.47e-02	Est = -1.54e-01 SE = 1.19 P-value = 8.98e-01	Est = -2.51e-02 SE = 1.23 P-value = 9.84e-01	Est = 2.41 SE = 1.21 P-value = 4.64e-02
Machine translation tools	G	Binomial	Est = 9.52e-01 SE = 4.67e-01 P-value = 4.14e-02	Est = -1.55 SE = 2.42e-01 P-value = 1.30e-10	Est = -9.82e-03 SE = 5.28e-03 P-value = 6.31e-02	Est = -2.38 SE = 4.56e-01 P-value = 1.80e-07	Est = 7.96e-01 SE = 3.18e-01 P-value = 1.24e-02

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