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Hidden Inequities in Peer Review: Integrating Geographic, Ethnic, and Linguistic Bias

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ABSTRACT

Peer review is often portrayed as the foundation of fairness in science, yet growing evidence reveals hidden inequities that undermine this ideal. Beyond geographic and ethnic disparities (where same-country reviewers, limited reviewer diversity, and editorial gatekeeping privilege particular regions), recent scholarship points to a subtler but pervasive linguistic bias. Scholars who use English as a foreign language may have their work more harshly judged, not because of scientific quality but due to deviations from norms of international academic English. However, philosophical analyses caution that "linguistic bias" encompasses distinct phenomena that must be separated to avoid overgeneralization, while empirical evidence remains mixed and methodologically limited. Experimental research indicates that reviewers may rate identical scientific content lower when written in non-standard English, suggesting that language fluency can inadvertently influence judgments of quality. Structural issues such as gender imbalance, institutional prestige, and reviewer fatigue further distort evaluation outcomes. Together, these intersecting forms of bias weaken the meritocratic ideal of peer review and perpetuate epistemic inequities in global knowledge production. Addressing them requires systemic reforms, mandatory reviewer training on bias awareness, expansion of reviewer diversity, linguistic and editorial support for non-native authors, and transparency in editorial decision-making. This integrated perspective underscores that genuine fairness in peer review demands recognizing and mitigating linguistic, geographic, and institutional asymmetries which silence underrepresented voices and constrain the inclusivity of global scholarship.

KEYWORDS

Peer review, linguistic bias, research equity, geographic disparities, ethnic bias, editorial fairness, reviewer diversity, scientific publishing

INTRODUCTION

Peer review is central to the credibility of science, determining which studies are published, which researchers secure funding, and whose voices shape the global knowledge landscape. Ideally, the process should be impartial, assessing only the quality of research. Yet, concerns about fairness are longstanding, and evidence of bias has accumulated across multiple dimensions. Studies have shown that women and underrepresented minorities face barriers in grant funding and publishing, often linked to subtle stereotypes and structural disadvantages[1-5]. Faculty members have been found to exhibit implicit gender biases when evaluating students, favoring men over women candidates with identical credentials[6].

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Analyses of grant applications reveal significant racial disparities in success rates, with black applicants less likely to receive funding compared to their white counterparts[7-9]. Biases related to institutional prestige also shape outcomes, as manuscripts and proposals from elite universities often receive more favorable treatment than equivalent work from less prominent institutions[10,11]. Collectively, these studies demonstrate that peer review outcomes are influenced not only by scientific merit but also by social identity and institutional affiliation.

Despite this growing body of work, empirical evidence on geographical inequities in peer review remains limited, largely due to the confidential nature of review data. Recent analyses reveal that reviewer homophily, where reviewers favor authors from their own country, and editorial gatekeeping can amplify regional privilege by marginalizing scholars from low-income or non-Western nations. Such patterns reinforce the dominance of established scientific centers and undermine the ideal of a globally representative research community.

In addition to these structural biases, the dominance of English as the lingua franca of academia introduces another layer of inequity. English facilitates international collaboration and dissemination[12,13], yet it also produces linguistic injustice and unfair treatment of individuals or ideas based on language use. Native English users (L1) generally enjoy a fluency advantage, while those using English as an additional language (LX) must devote greater effort to meet linguistic expectations. This linguistic asymmetry affects research output and visibility; LX scholars often publish less[14] and experience diminished academic influence despite comparable expertise[15].

Philosophers and linguists have argued that LX scholars may face "linguistic bias," defined as the psychological tendency to evaluate people or their contributions less favorably due to perceived nonstandard language[16]. Yet, conceptual clarity and empirical rigor are often lacking. Peters[17] cautions that existing studies vary widely in methodology, sometimes conflate accent bias, linguistic profiling, and stylistic variation, and fail to address counterevidence that challenges simplistic claims.

Parallel debates in applied linguistics reflect similar tensions. Linguistic injustice remains unproven and may divert attention from more pressing inequities, such as geographic and institutional disparities. Conversely, Flowerdew[18] and Yen and Hung[14] contend that linguistic injustice is real and warrants systemic intervention. A key empirical contribution by Politzer-Ahles *et al.*[19] used a randomized design to test whether deviations from international academic English influence peer judgments. Although results were preliminary, they indicated that reviewers may rate identical scientific content less favorably when expressed in nonstandard English.

The primary objective of this study is to provide an integrated analysis of how linguistic, geographic, and ethnic biases intersect to influence fairness in academic peer review. It seeks to examine the extent to which reviewer homophily, editorial gatekeeping, and linguistic norms shape evaluation outcomes, often privileging certain authors while disadvantaging others from underrepresented or non-Anglophone regions. By synthesizing philosophical arguments and empirical findings, the study aims to determine whether linguistic bias, particularly against authors using English as an additional language, affects perceptions of scientific quality and credibility. Furthermore, it compares these linguistic inequities with existing evidence of geographic and ethnic disparities, thus revealing overlapping mechanisms of exclusion within scholarly publishing. Ultimately, the study aspires to propose concrete reforms, including reviewer training, editorial transparency, and linguistic support mechanisms to foster a more equitable, inclusive, and globally representative peer review system.

PHILOSOPHICAL AND EMPIRICAL DIMENSIONS OF LINGUISTIC BIAS

The philosophical debate surrounding linguistic bias challenges the assumption that linguistic norms in academic writing are neutral. "Good English" is often treated as a marker of intellectual competence rather than linguistic conformity, reinforcing implicit hierarchies between native and non-native English users[14]. Reviewers may unconsciously equate syntactic or stylistic deviations with lower scholarly quality, thereby penalizing non-native authors even when their arguments and methods are sound. This dynamic sustains epistemic injustice and privileges scholars from linguistically dominant regions.

Empirical evidence lends weight to these concerns. A randomized controlled study comparing identical scientific abstracts written in more versus less standard English found that reviewers tended to rate the "standard" versions as better, despite equivalent content. Although the effects were modest, the findings indicate a measurable "linguistic penalty" for non-native expression. This linguistic bias intersects with other structural inequities such as geography, ethnicity, and institutional prestige, suggesting that non-Western authors face multiple, overlapping disadvantages in academic publishing[13,16].

GEOGRAPHIC AND ETHNIC DISPARITIES IN PEER REVIEW

Recent large-scale studies have demonstrated that inequities extend beyond language to include geography and ethnicity. Dumlao and Teplitskiy[1] analyzed over 200,000 submissions across 60 Institute of Physics journals (2018-2022) and identified a 4.78% increase in positive recommendations when reviewers and authors shared the same country. Authors in the U.S. and China benefited most, being 8-9 times more likely to receive same-country reviews than those from low-income regions. Importantly, introducing double-anonymized review did not significantly reduce this advantage, implying that bias operates through shared epistemic cultures rather than simple name recognition.

Complementary evidence from Strauss *et al.*[2], based on 16,500 biology submissions (2013-2018), revealed ethnic disparities in editorial decisions. East Asian authors were 4.3-14.6% less likely to have their papers accepted than British-origin counterparts, even after adjusting for manuscript quality, topic, and prestige. Discrepancies were strongest at the desk-rejection and final decision stages, indicating that editors, not reviewers, drive much of the inequity. Accepted papers by East Asian authors required higher reviewer scores, and disparities persisted even among U.S.-based East Asian researchers.

Inequities in peer review stem from structural factors, reviewer homophily, editorial heuristics, and network asymmetries, rather than isolated individual prejudice. Traditional reforms such as anonymization alone appear insufficient. More effective measures include diversifying editorial and reviewer pools, instituting linguistic sensitivity training, conducting equity audits, and promoting multilingual outlets to ensure a more inclusive and representative global research system.

INTERSECTING MECHANISMS AND STRUCTURAL BIASES

Inequities in peer review arise from interacting mechanisms that reinforce one another across linguistic, geographic, and institutional dimensions. Norm reinforcement by reviewers is central to this system: reviewers often apply Anglophone standards of clarity and argumentation, interpreting deviations as intellectual weakness rather than linguistic or cultural variation. Such expectations privilege native English writers and marginalize scholars from non-English or less prestigious institutions[1].

Self-selection and discouragement further entrench inequity, as researchers from underrepresented regions frequently avoid submitting to high-impact journals due to perceived bias or prior rejection experiences[2]. Lack of editorial oversight compounds these effects, since few journals track acceptance rates by region or language, allowing inequities to persist unnoticed[3]. Opaque feedback practices obscure the reasons for rejection, leaving authors unable to discern whether decisions stemmed from linguistic form or scientific content[4].

Network and power asymmetries deepen the imbalance. Editorial and reviewer pools often overlap with elite institutions, reinforcing cycles of privilege and limiting the participation of scholars from the Global South[5]. These interlinked mechanisms constitute a system of cumulative disadvantage, where linguistic, geographic, and institutional hierarchies jointly determine whose research is recognized and disseminated.

Addressing such structural inequities requires systemic rather than cosmetic reform. Effective measures include[20-23]:

- Diversifying reviewer and editorial pools to ensure regional balance
- Implementing linguistic support services independent of acceptance decisions
- Instituting regular equity audits and transparent reporting on editorial outcomes
- Training reviewers to separate linguistic style from scientific substance

Together, these interventions can transform peer review from a gatekeeping mechanism into a genuinely inclusive process, one that recognizes intellectual merit across linguistic and geographic boundaries and restores trust in science as a global enterprise.

ADVANCING EQUITY THROUGH STRUCTURAL REFORM

Evidence from recent studies confirms that these inequities are structural rather than incidental. Geographic homophily and ethnic disparities shape which voices are amplified and which are marginalized, often independently of scientific merit. Such dynamics erode the credibility of peer review as a meritocratic system and perpetuate global imbalances in knowledge production. Addressing these issues requires multi-level reforms that move beyond anonymization to foster accountability, inclusivity, and transparency.

To advance equity in peer review, several interlocking policy directions are recommended:

- **Diversify reviewer pools:** Journals should actively recruit reviewers from underrepresented regions and linguistic backgrounds, supported by AI-assisted reviewer selection or professionalized peer review services
- **Audit editorial practices:** Regular independent or in-house audits of desk-rejection and final decision stages can identify and correct systemic disparities
- **Enhance transparency:** Publishers should release anonymized data on acceptance rates by country, ethnicity, and gender, and consider sharing editorial communications to expose hidden biases
- **Experiment with reviewer assignment:** Controlled trials could test whether deliberate diversification of reviewer panels or machine-assisted translation reduces disparities and reviewer fatigue
- **Training and awareness:** Editors and reviewers should undergo mandatory training on linguistic sensitivity, implicit bias, and decision heuristics. Recognition of reviewing as an academic service in promotion criteria could also encourage broader participation
- **Institutional and linguistic support:** Journals should provide accessible English editing or translation services, separate from acceptance decisions, and support multilingual or bilingual publication models
- **Diversify editorial boards:** Inclusion of editors from varied linguistic and regional backgrounds can broaden evaluative perspectives and weaken monocultural dominance

Only through such systemic, evidence-informed reforms can peer review evolve into a genuinely fair arbiter of scientific quality, one that reflects the full global diversity of ideas, methodologies, and voices in research.

CONCLUSION

The evidence reviewed across philosophical, linguistic, and empirical domains makes clear that inequities in peer review are structural rather than incidental. Geographic homophily, ethnic disparities, and linguistic bias intersect to determine whose research is recognized, amplified, or marginalized. These inequities undermine the principle of meritocracy in science and distort the global distribution of scholarly influence. Addressing them requires systemic reform rather than incremental adjustment, diversifying reviewer and editorial pools, enhancing transparency and accountability, and embedding bias-awareness into all stages of evaluation.

Concomitantly, philosophical discussions of linguistic bias must remain empirically grounded. Linguistic injustice encompasses multiple forms of bias, some more pervasive or harmful than others. While the existence of linguistic bias is not in doubt, the evidence supporting certain claims has often been overstated or insufficiently scrutinized. A more critical and nuanced approach, recognizing methodological limitations, counter-evidence, and variation across contexts, will strengthen future theorizing.

Taken together, both empirical and philosophical analyses converge on a common insight: fairness in peer review depends on acknowledging the social and linguistic structures that shape scientific evaluation. Meaningful progress toward linguistic and geographic equity will not only improve procedural justice in publishing but also enrich the epistemic diversity upon which scientific innovation depends.

SIGNIFICANCE STATEMENT

This perspective underscores how geographic, ethnic, and linguistic biases systematically shape outcomes in peer review, privileging authors from regions with stronger reviewer representation while marginalizing scholars from underrepresented contexts. By demonstrating that anonymization alone does not eliminate such disparities, the analysis reveals that inequities in scientific publishing are structural rather than incidental. The discussion aims to guide researchers, editors, and policymakers in identifying critical areas of systemic bias that previous investigations have often overlooked. Recognizing these patterns is essential, as unequal access to visibility and recognition perpetuates global imbalances in knowledge production and narrows the diversity of scientific perspectives. This work provides an evidence-based foundation for designing reforms that promote a more inclusive, transparent, and globally representative peer review system.

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