

caution, and humility, expressing possibility rather than certainty and prudence rather than overconfidence. In a context where the accreditation of knowledge depends on the consensus of the research community and the need to evaluate evidence, comment on its reliability, and avoid potentially hostile responses (the “boomerang effect”), expressions such as “may”, “might”, “could”, “possible”, and “likely” can contribute to gaining the acceptance of research claims.

Medical and scientific writers in general thus need to decide on the level of the knowledge claims they wish to make. They are in a position of tension because the higher the level of claim the more likely it is that its assertion will contradict existing positions and challenge the assumptions underlying ongoing research in the area. “Claim-making is a risky practice,” as Ken Hyland expresses it.<sup>1</sup> It is by resorting to hedges that researchers modify the “epistemic warrant”, the confidence and uncertainty, of their claims. These devices allow the writer to show that s/he is not fully committed to the propositional content of the utterance or that s/he opens a discursive space where readers can dispute the writer’s interpretations.

Hedges are among the main pragmatic features which shape the research paper as the principal vehicle for new knowledge and which distinguish it from other forms of academic discourse.<sup>2</sup> They allow researchers to produce a closer fit between their statements about new discoveries and the pre-existing understandings within the scientific community. They are therefore both cautious and interactive devices in that they build a relationship between the writer and the community of readers and allow academic writers to anticipate their audience reactions by moderating the degree of certainty with which they present their knowledge claims. Robert Boyle (1627–1691) was, if not the inventor of hedging, at least the foremost institutionalizer of “modesty” strategies in empirical science writing.<sup>3</sup>

Because hedges can express politeness, indirectness, understatement, mitigation, commitment, and/or vagueness, they are pragmatically polyfunctional<sup>4</sup> and have been the focus of extensive research in all kinds of discourses, scientific discourse being one of them.

Since George Lakoff published the first research on hedging in 1972,<sup>5</sup> an abundant literature has demonstrated the importance of this socio-pragmatic phenomenon in Anglo-American scientific/academic writing using different approaches, but no real consensus has been reached. We could almost say that there are as many approaches as there are researchers who studied the phenomenon. This lack of consensus was exemplified in the late 1990s by the radically opposed stances adopted by Peter Crompton<sup>6</sup> on the one hand, who advocated using the scientific method to analyse the subject, and myself<sup>7–9</sup> on the other, whose mentalistic approach defined hedges as primarily the product of a mental attitude. Hedges are no longer approached from a semantic perspective but rather from a socio-pragmatic one.

Linguists and applied linguists from a number of other cultural and linguistic backgrounds have also studied the phenomenon of hedging in written scientific discourse. Research papers in French use much more prescriptive,

authoritarian, and categorical language than those written by English-speaking colleagues.<sup>10–12</sup> Researchers writing in English instead tone down their claims, using so-called *bémol* statements<sup>10</sup> when stating their claims and rejecting the opinions of others, thus avoiding the so-called Face-Threatening Act.<sup>13</sup> It has been argued that in the use of such “*précautions oratoires*” we find the most prominent cultural difference between English and French academic writing.<sup>14</sup> This led Christiane Beaufrère-Bertheux to refer to the *hypermodestie* of Anglo-American scientists,<sup>15</sup> and Claude Sionis to describe the “exaggerated self confidence of French academics”, who therefore sound arrogant to their Anglo-American counterparts.<sup>16</sup>

Arrogance and over self-confidence (that is, a lack of hedging devices) have also been noted in Finnish academic writing<sup>17</sup> and in research papers written in Bulgarian and English by Bulgarian-speaking scientists<sup>18,19</sup> when compared with research papers written in English by native-English-speaking scientists, thus suggesting that Finnish and Bulgarian academic writers show a higher degree of commitment and, consequently, a lower degree of deference, toward the discourse community than their English counterparts.

A comparison of the rhetorical styles of internationally published medical journal articles written by Sudanese and British researchers found differences in the “expression of non-evidential truth” in samples from discussion sections of the articles.<sup>20</sup> Sudanese medical writers, compared with British medical writers, are weaker in indicating research implications and promoting further research. Their writing contains less self-expression or personal voice, even though subjective interpretation of data is desirable in discussion sections, since it paves the way for future research. Such differences reflect not only Sudanese writers’ English writing skills but also cultural factors. These include the discouragement of personal voices in the collectivist culture in Sudan, and competitiveness between members of Sudanese academia, which results in the “fear of encouraging rival research groups in an environment where there is intense competition for funding”<sup>20</sup>

Research papers written in Spanish and in English by Spanish-speaking scientists were also found to use less hedging, or modalization, than those written in English by native-English-speaking scientists,<sup>21,22</sup> as were papers written in Dutch by Dutch authors.<sup>23</sup> In contrast, research papers written in German and English by German authors,<sup>24,25</sup> in Polish by Polish writers,<sup>26</sup> and in Czech by Czech writers<sup>27</sup> show a higher degree of hedging and of tentative, affective statements than papers written in English by English-speaking writers.

Research into hedging in East Asian languages is more contentious. Although Eli Hinkel claims that hedging is common in the Confucian rhetorical tradition,<sup>28</sup> and although previous research shows that essays written by Asian students from that background tend to be “overhedged”, his study is inconclusive. Hyland and Milton’s analysis of hedging in the Hong Kong University of Science and Technology’s learners’ corpus showed that essays written by proficient learners were more heavily

hedged (that is, written according to Anglo-American rhetorical norms) than those written by less proficient ones, thus suggesting that a learner's proficiency level plays a role in the use of hedges.<sup>29</sup> At any rate, Hinkel's different findings may result from the essay prompts he used, and this highlights the importance of corpus design (sampling of texts).

These differences indicate that hedging forms part of the system of conventions underlying academic writing and that, being conventional, it is culture specific as well.

It should be emphasized, however, that discipline and textual genre play an important role in the frequency of use of hedging devices, research papers from the humanities and social sciences using more probability expressions/modalization than those belonging to the "hard" and natural sciences. Comparisons of hedging in 19th and 20th century scientific writing have also shown that differences in the use of modalization between them lie not so much in the frequency of hedging devices but in the type of devices used.<sup>30,31</sup> Other variables could also affect the use of modalization in academic/scientific writing, such as the writer's status, age, and sex, but these variables have rarely, if ever, been taken into consideration, perhaps because of the difficulty of analyzing them.

**Competing interests** None declared.

## References

- Hyland K. *Disciplinary discourses: social interactions in academic writing*. London: Longman, 2000:93.
- Hyland K. *Hedging in scientific research articles*. Amsterdam: John Benjamins, 1998.
- Atkinson D. *Scientific discourse in sociohistoric context*. Mahwah, NJ: Lawrence Erlbaum, 1999.
- Clemen G. The concept of hedging: origins, approaches and definitions. In Markkanen R and Schröder H, eds. *Hedging and discourse: approaches to the analysis of a pragmatic phenomenon in academic texts*. Berlin: Walter de Gruyter, 1997:235–248.
- Lakoff G. Hedges: a study in meaning criteria and the logic of fuzzy concepts. *Chicago Linguistic Society* 1972;8:183–228
- Crompton P. Hedging in academic writing: some theoretical problems. *English for Specific Purposes* 1997;16(4):271–287.
- Salager-Meyer F. Hedges and textual communicative function in medical English written discourse. *English for Specific Purposes* 1994;13(2):149–170.
- Salager-Meyer F. Language is not a physical object. *English for Specific Purposes* 1998;17(3):295–303.
- Salager-Meyer F. Procrustes' recipes: hedging and positivism. *English for Specific Purposes: An International Journal* 2000;19(2):175–189.
- Régent O. L'article scientifique: un produit culturel. *ASp (Anglais de spécialité)* 1994;5/6:55–61.
- Crosnier E. L'intérêt de la modalisation comme aide à la rédaction en anglais pour les scientifiques français. *Méthodologie et perspective pédagogique. ASp (Anglais de Spécialité)* 1996;11/14:89–103.
- Liddicoat AJ. Writing about knowing in science. *LSP and Professional Communication* 2005;5(2):8–27.
- Brown G, Levinson S. *Politeness: some universals in language usage*. Cambridge: Cambridge University Press, 1987.
- Martin J. Les enjeux du discours scientifiques: la stratégie de véridiction. *ASp (Anglais de Spécialité)* 1996;11/14:13–33.
- Beaufrière Bertheux C. L'anglais de la recherche médicale: une grande diversité. *ASp (Anglais de Spécialité)* 1997;15/18:223–238.
- Sionis C. Writing scientific discourse beyond words. *ASp (Anglais de Spécialité)* 1997; 15-18: 339-57.
- Ventola E. Modalization: probability – an exploration into its role in academic writing. In: Duszak A, ed. *Culture and styles in academic writing*. Berlin, New York: Mouton de Gruyter, 1997:157–179.
- Vassileva I. Hedging in English and Bulgarian academic writing. In: Anna Duszak, ed. *Culture and styles of academic discourse*. Mouton de Gruyter: Berlin, 1997:203–223.
- Vassileva I. Commitment and detachment in English and Bulgarian academic writing. *English for Specific Purposes* 2001;20:83–103.
- ElMalik A, Nesi H. Publishing research in a second language: the case of Sudanese contributors to international medical journals. *Journal of English for Academic Purposes* 2008;7(2):87–96.
- Oliver del Olmo S. Análisis contrastivo español/inglés de la atenuación retórica en el discurso médico. El artículo de investigación y el caso clínico. Tesis doctoral. Barcelona. Universitat Pompeu Fabra, 2004.
- Mendiluce Cabrera G, Bartolomé H. La matización asertiva en el artículo biomédico: una propuesta de clasificación para los estudios contrastivos inglés-español. *Ibérica* 2005;10:63–90.
- Burrough-Boenisch J. NS and NNS scientists' amendments of Dutch scientific English and their impact on hedging. *English for Specific Purposes* 2004; 24(1):25–39.
- Clyne MG. The sociocultural dimension: the dilemma of the German-speaking scholar. In: Schröder H, ed. *Subject-oriented texts*. Berlin and New York: De Gruyter, 1991:49–67.
- Kreutz H, Harres A. Some observations on the distribution and function of hedging in German and English academic writing. In: Duszak A, ed. *Culture and styles of academic discourse*. Berlin: Mouton de Gruyter, 1997:181–201.
- Duszak A. Academic discourse and intellectual styles. *Journal of Pragmatics* 1994;21:291–313.
- Cmerjrková S, Danes F. Academic writing and cultural identity: the case of Czech academic writing. In: Duszak A, ed. *Culture and Styles in Academic Discourse*. Berlin: Mouton de Gruyter, 1997; 41–62.
- Hinkel E. Objectivity and credibility in L1 and L2 academic writing. In: *Culture and second language teaching and learning*. Cambridge: Cambridge University Press, 1997:90–108.
- Hyland K, Milton J. Qualification and certainty in L1 and L2 students' writing. *Journal of Second Language Writing* 1997;16(2):183–205.
- Salager-Meyer F, Defives G. From the gentleman's courtesy to the expert's caution: a diachronic analysis of hedges in academic writing (1810-1995). In: Fortanet I, Posteguillo S, Palmer C, Coll JF (Eds). *Genre studies in English for academic purposes*. Castellon. Spain. Universitat Jaume I, 1998:133–171.
- Gross AG, Harmon JE, Reidy MS. *Communicating science: the scientific article from the 17th century to the present*. Oxford: Oxford University Press, 2002.

---

## Essays in Editing

---

### Native and non-native speakers of English as copy-editors of research papers

**Yateendra Joshi**

*Cactus Communications, 510 Shalimar Morya Park, Mumbai – 400 053, India; yateendra.joshi@gmail.com*

**Abstract** The relationship between proficiency in a language (at the level of a native speaker of that language) and the ability to carry out a range of tasks as part of copy-editing of research papers is examined with particular reference to English. Many of these tasks are unrelated to language but demand an eye for detail, sustained concentration, familiarity with style conventions, and domain knowledge. The relative strengths of native and non-native speakers of English as copy-editors are compared.

**Keywords** Copyediting; technical editing; language editing; quality of editing

A recent report by the Society for Editors and Proofreaders in the UK, titled *What price quality? Overseas outsourcing of editorial services*, summarizes the perspectives of many of its members.<sup>1</sup> The issue of native and non-native speakers as editors features now and then in the EASE Forum as well as in *European Science Editing*.<sup>2</sup> Outsourcing is bound to be a sensitive issue among editors, whether native or non-native speakers of the language in which they edit, since it can directly affect their livelihood.

However, many aspects of such outsourcing, especially outsourcing of copy-editing, bear disinterested scrutiny, and this essay is one such attempt, confined mainly to copy-editing of research papers written in English by non-native speakers of English for publication in English-language journals. This is an important distinction because publishers from English-speaking countries often outsource copy-editing to other countries not so much to fix errors related to idioms and usage as to take care of other aspects such as matching text citations and references, ensuring consistent treatment of headings, and type coding (tagging items other than running text, such as headings, extracts, and lists).

Few will contest, as a general observation, that when it comes to copy-editing such papers, native speakers are at an advantage. They are at a disadvantage when it comes to pricing, however, because typically they live in places where the cost of living is high. However, this is not a straightforward issue of quality versus costs, as I hope to show.

#### Aspects of copy-editing unrelated to language

If a copy-editor's job is to prepare copy for the press (or, increasingly, for its electronic equivalents), a number of aspects other than language require his or her attention. In fact, the exhaustive checklist of tasks related to copy-editing found in *Butcher's Copy-editing* runs to 20 pages of which only one heading, namely "Author's argument", containing 11 lines in all, lists tasks that are more or less exclusive to language.<sup>3</sup>

#### References

More than 40% of the changes made as part of copy-editing in Waites and Campbell's survey were related to references.<sup>4</sup> Matching citations to references, putting in all the required bibliographic information, and formatting the references in the style required by the journal require an eye for detail, persistence, access to the internet, and application of mind – matters not tied to any particular language.

#### Stylistic consistency

To change litres to L, to replace a hyphen between two numbers with an en dash, or to italicize "in vitro" require not so much a flair for language as attention to detail, sustained concentration, and familiarity with style conventions.

#### Tables and figures

Similar considerations apply to tables and charts, two other common adjuncts to research papers. And editing these adjuncts effectively is more a matter of numeracy than of literacy. Figures other than charts make greater demands on the ability to visualize than on verbal fluency.

#### Domain knowledge

One area in which copy-editors in English-speaking countries have an edge over those from other countries is one that, in my experience, has little to do with English, and that area is domain knowledge: English-speaking countries simply have a greater proportion of copy-editors with qualifications and experience that match the academic disciplines in which they copy-edit and are thus able to copy-edit more effectively, especially when it comes to turning what is often clumsy writing into elegant prose. As one participant in the SfEP survey puts it, "Some copy-editors took on work that they are not able to understand; in places it was clear that the editor had insufficient science to unravel what the authors intended."<sup>1</sup>

#### Software

Copy-editing today requires much greater facility than before with computers in general and word processing in particular. The internet is the copy-editor's trusted ally. Repurposing texts for different platforms and applications, preparing files for automated typesetting, and type coding in particular are skills increasingly expected of copy-editors. As with numeracy and graphic literacy, computer literacy has little to do with fluency in language.

#### Readers

English is a global language. The latest (3rd) edition of the *Oxford Dictionary of English* had on its staff not only specialist subject consultants in 23 domains ranging from

aeronautics to statistics but also World English consultants representing nine “Englishes”, from US English to South African English, the largest panel being that for Indian English.

David Crystal estimated that the number of English speakers in non-English-speaking countries is three times that of native speakers of English.<sup>5</sup> For all I know, subscribers from other countries to scientific journals in English published from English-speaking countries also outnumber the subscribers from English-speaking countries – which brings up the matter of readers’ expectations. As a non-native speaker of English, I find that articles and prepositions are tricky beasts; as I struggle to mask my infelicities in their correct use, I often wonder how many readers of research papers who are non-native speakers of English will be troubled by my lapses. For example, in an early draft of this essay, a kindly native speaker of English changed “break even *from* sales of these titles” to “break even *on*” (see below). And if the majority of buyers do not care about, or do not even notice, such errors, how long will sellers continue spending money to fix them?

A recent discussion on the EATAW list (European Association for the Teaching of Academic Writing) was focused on possible responses to a doctoral thesis written in non-standard English. The remark that is relevant here, from a native speaker of English, is about readers: “while they might notice an Indian flavour, [they] would not complain that this was not standard English.”

### Errors

Discussions related to outsourcing often seem to imply that native speakers of English never make grammatical or other language-related errors. If this is indeed so, I wonder how the publishers of *Modern English Usage* or of *Mind the Gaffe* managed to break even on sales of these and similar titles, or how *Eats, Shoots & Leaves* made it to the Christmas best-seller list of Amazon UK soon after it was published. Then there is Paul Briens’ website *Common Errors in English Usage*, which, as the FAQ section informs its visitors, is “aimed at the most common errors of native speakers.”<sup>6</sup> And this applies even to copy-editors.

Another relevant factor is formal instruction in grammar. Indeed, as Einsohn puts it, the approach to punctuation “taken by all the editorial style manuals is to punctuate according to grammatical and syntactical units.”<sup>7</sup> To follow this approach requires familiarity with formal grammar, which is invariably taught in schools when one learns a language as a second language; those who grow up speaking it do not always have that benefit.

### Quality of rewrites

The SfEP report mentions that editors from other countries rarely attempt to make the text more readable; when they do so, the re-writes often introduce grammatical errors.<sup>1</sup> The reluctance may stem in part from lack of domain knowledge and in part from the shorter turn-around times, which are often used to sell outsourcing.

### Customers’ requirements

In a free market economy, it is for customers or clients and not for service providers to weigh the trade-offs: to pay more for a higher-quality service, or pay less and settle for a satisfactory quality – satisfactory to the buyer, that is. This issue is at the heart of many a heated discussion on outsourcing: one post in a recent discussion on the Copyediting-L discussion forum on outsourcing (triggered, as it happens, by the SfEP report mentioned earlier) suggested that it is pricing that separates looking overseas for relevant expertise from outsourcing; that is, when cost is a primary factor in the contracting decision.

Who exactly are the customers when it comes to copy-editing services for academic publishing? One category – probably the largest – is authors whose manuscripts are returned by journals because of deficiencies related to language. For them, quality is what the journal or, to be more exact, its reviewers, find *acceptable*. For these customers, cost is obviously an important criterion.

Publishers form the second category and probably demand higher quality, which copy-editors who are native speakers are more likely to supply. However, publishers are not impervious to costs and may well prefer outsourcing if non-native speakers are good enough – a subjective judgement – and offer to do the job at substantially cheaper rates. Although readers are the final consumers or “end users”, they are the least influential customers of copy-editing services in the context of scientific journals.

Lastly, there is also the matter of speed and availability, the two factors often used to justify outsourcing. Given the time difference, it is easier to provide overnight service when it is outsourced, and speed may trump quality.

**Competing interests** The current essay may possibly attract customers seeking the author’s copy-editing services.

### References

- 1 Lyle K. What price quality? Overseas outsourcing of editorial services. SfEP report: February 2011. <http://www.sfep.org.uk/pub/news/outsourcing.asp>. (Accessed 7 March 2011.)
- 2 Kozak M. A call from a non-native English speaker: don’t look at my affiliation. *European Science Editing* 2008;34(4):100–104.
- 3 Butcher J, Drake C, Leach M. 2006. *Butcher’s copy-editing: the Cambridge handbook for editors, copy-editors and proofreaders*. 4th ed. Cambridge: Cambridge University Press, 2006:432–452.
- 4 Wates E, Campbell R. Author’s version vs. publisher’s version: an analysis of the copy-editing function. *Learned Publishing* 2007;20(2):121–129.
- 5 Crystal D. *English as a global language*. 2nd ed. Cambridge: Cambridge University Press, 2003:69.
- 6 Briens P. *Common errors in English usage*. 2nd ed. Sherwood, OR: Franklin, Beedle, 2008. <http://www.wsu.edu/~briens/errors/index.html>. (Accessed 7 March 2011.)
- 7 Einsohn A. *The copyeditor’s handbook: a guide for book publishing and corporate communications*. 2nd ed. Berkeley: University of California Press, 2006:73.

## Perspectives on science editing and publishing in Iran: think globally, act locally

**Mohammad Abdollahi**

*Department of Toxicology and Pharmacology, Faculty of Pharmacy, and Pharmaceutical Sciences Research Centre, Tehran University of Medical Sciences, Tehran 1417614411, Iran; mohammad@tums.ac.ir*

**Abstract** Scientists have the skills to write and structure their papers but frequently need support of other professionals to edit and publicize their works. Nowadays, scientific papers are evaluated on the basis of their “impact”, and a journal’s quality is dependent on high quality publications. In Iran, two options are available for scientific journals to overcome the issue of growing editing and publishing costs: to involve leading regional and global publishers in the publishing process and to establish outlets for these publishing agencies. The problem is not just Iranian but affects many other developed and developing countries and is becoming a big issue in times of global financial crisis.

**Keywords** Periodicals as topic; editorial policies; quality control; abstracting and indexing as topic; publishing; Iran

Science in Iran had an impressive history during ancient times, and the growth in Iranian science output, especially during the past 20 years, is apparent from scientometric databases.<sup>1</sup> Iran has become a rapidly growing science producer in the world, based on experts’ opinion and reports of the Institute for Scientific Information (ISI) Science Watch, and SCImago Journal and Country Rank.<sup>2,3</sup> The advancement of science is based on high quality research, and proper writing, editing, and publishing of papers that should be widely disseminated and evaluated.

Scientific publications are the final stage of research. Scientists have the skills to write and structure their papers but frequently need support of other professionals to edit and publicize their works. In fact, scientific publishing cannot be separated from acquisition, copy editing, graphic design, production, printing, marketing, and distribution. The scope of publishing has expanded to include electronic resources, which have been growing rapidly since 2005, especially due to the cost-effectiveness issues that are challenging the publishing market. Successful publications impact greatly on science in terms of communication between scientists and give birth to new ideas, knowledge, and technology.

Databases such as Scopus and Essential Science Indicators from ISI evaluate scientific publications to rank countries, institutions, scientists, and journals.<sup>4,5</sup> These databases distinguish top scientists, papers, and journals. Nevertheless the ranking based on “impact” should be interpreted with caution, given the inherent limitations of current scientometric indices.<sup>6</sup> Shifting from traditional journal management to the new standards, the so-called “change or perish” process, is crucial for a journal’s survival.<sup>7</sup>

During the past 40 years, Iranian scientists have published more than 130,000 papers, mostly in journals published

abroad.<sup>4</sup> The number of scientific journals published in Iran listed in Index Copernicus is 215; most are supported by local universities and research institutions.<sup>8</sup>

Most Iranian publishers are actively involved in book publishing. To publish scholarly journals and to make them visible in an international arena, they need the support of experts in science editing, but this is not always appreciated by the publishers. Some journal publishers still do not use online editorial management software, a prerequisite of success for editing and publishing a modern scientific journal.

The number of Iranian journal publishers is currently not sufficient, and most journals are managed by scientific editors from the first to the final stages of editing and publishing. This burden may negatively affect the editorial process. In most cases, local universities have provided software for online submission and management after negotiation with various software providers but the problem of publishing and marketing is still there.

Importantly, most scholarly journals published in Iran do not have sufficient individual and institutional subscribers to cover editing and publishing costs. It should be emphasized that most Iranian journals are indexed in global databases such as Google Scholar, Scopus, Directory of Open Access Journals, and only a few are indexed in Web of Science and PubMed. In a survey conducted in 2009, some Iranian journals were found to contain several technical mistakes, including those of incorrect referencing, making being accepted for indexing in local and global databases a daunting task.<sup>9</sup>

I believe most Iranian journals should meet the indexing requirements of leading global databases, should have fully digitized editorial management, and gradually switch from print to electronic publication (print on demand) mode. The latter would allow regular updating of the content of the journal’s website, evaluation of the performance of editorial board members, and would save time for review.

Most Iranian editors are doing their best to meet writing, editing, and publishing standards proposed by EASE, COPE, WAME, and other learned societies. Science editing issues are regularly discussed during numerous national and international seminars held throughout the country. One such meeting took place in Isfahan, 13-14 May 2010, to discuss ways to improve the quality of local medical journals and to avoid common errors in writing articles.<sup>10</sup>

In my opinion, two options are available for scientific journals to survive and to overcome the issue of growing editing and publishing costs: to involve leading regional and global publishers in publishing Iranian journals and to establish outlets for these publishing agencies in Iran. As

an author and editor of several national and international journals with experience in science journalism,<sup>11</sup> I believe that we have to take advantages of both options.

I also believe that the circulation of print copies of scientific journals has to be reduced, and more funding should be allocated to electronic publications with an advanced scientometric profile.

The problems outlined are not just Iranian but affect many other developed and developing countries and are becoming big issues in times of global financial crisis. Therefore my message is to think globally and act locally by establishing regional scientific journal publishing companies to cover the costs of high quality journals in the Eastern Mediterranean region.

MA is a member of the World Association of Medical Editors (WAME) and of the Committee on Publication Ethics (COPE)

**Competing interests** None declared.

## References

- 1 Abdollahi M. Perspectives of Science in Iran. *Iranian Journal of Pharmaceutical Research* 2010; 9(3): 207-208.
- 2 Science Watch. Middle East revisited: Iran's steep climb. <http://sciencewatch.com/ana/fea/10novdecFea>. (Accessed 26 March 2011.)
- 3 SJR. SCImago Journal and Country Rank. <http://www.scimagojr.com>. (Accessed 26 March 2011.)
- 4 Scopus. <http://www.scopus.com>. (Accessed 25 March 2011.)
- 5 ISI Web of Knowledge. <http://esi.isiknowledge.com>. (Accessed 26 March 2011.)
- 6 Gasparian AY. Thoughts on impact factors and editing of medical journals. *Inflammation and Allergy – Drug Targets* 2010; 9(1): 2-5.
- 7 Malekzadeh R, Habibzadeh F. Change or perish. *Archives of Iranian Medicine* 2008;11(4): 360.
- 8 Index Copernicus. <http://journals.indexcopernicus.com>. (Accessed 25 March 2011.)
- 9 Merat S, Khatibzadeh S, Mesgarpour B, Malekzadeh R. A survey of the current status of web-based databases indexing Iranian journals. *Archives of Iranian Medicine* 2009;12(3):271–278.
- 10 Iranian medical editors hold 2nd meeting; News and Views from COPE. *Ethical Editing* 2010; 2(2):8.
- 11 ResercherID. <http://www.researcherid.com/rid/B-0232-2008>. (Accessed 26 March 2011.)

---

## Improving peer review in scholarly journals

**Lutz Bornmann**

Max Planck Society, 80539 Munich, Germany; bornmann@gv.mpg.de

**Philippa Mungra**

Associate Editor, *Asian English for Specific Purposes Journal*; Emeritus Professor, 1st Medical School, University of Rome "La Sapienza", Rome, Italy

**Abstract** Peer review in scholarly journals can be improved by masking of both authors' and reviewers' identities (double-blind) or by using open-to-public peer review. This essay deals with currently available options for improving peer review and offers suggestions for enhancing the quality of publications.

**Keywords** Confidentiality; periodicals as topic; peer review; research standards

Proponents of the traditional peer review system claim that it is an essential tool for enhancing scientific knowledge. On the other hand, critics present a range of arguments: reviewers rarely agree on suitability of a manuscript for publication, thus questioning the reliability of peer review; reviewers' recommendations are frequently based on subjective arguments and do not favour non-native English speakers; the predictive value of peer review is low, since there is a weak (if any) association between the reviewers' comments and the usefulness of the work for the scientific community, measured in terms of citations<sup>1,2</sup>; peer review is time consuming and costly; and, reviewers' comments can be painful and distressing for novice authors.<sup>3,4</sup>

### How to improve peer review

Alternatives to peer review, such as inviting authors to write articles with a guarantee of publication and relying on the

"old boys' network" to identify up-and-coming researchers, violate the principle that research and scholarship should be evaluated and recognized on their merits, not on their social prestige or connections.<sup>5</sup> Some alternatives, particularly the auction-based approach, are difficult to execute and ethically questionable. The better the submitted paper, the more scientific currency the author will be likely to bid to have it published.

The main approaches to the improvement of traditional peer review are masking the identity of both authors and reviewers (double-blind) and public peer review.

### Double-blind review

In single-blind review, the most common review practice, authors do not know the identity of reviewers<sup>6</sup> but are able to correctly identify reviewers in about 5% of cases.<sup>7</sup> Keeping the names and affiliations of reviewers confidential encourages reviewers to be candid in their evaluations, and such confidentiality may also attract qualified scientists.<sup>8</sup> Not surprisingly, reviewers also prefer to comment anonymously.<sup>9</sup> Informing reviewers about the authors' identity may lead to biases related to authors' previous work, gender, and nationality.<sup>10</sup> To avoid such biases, masking identity of the authors is recommended.<sup>11-14</sup>

Nonetheless, double-blind review has disadvantages. Proponents believe that knowing the authors' identity

makes it easier to compare the new manuscript with previously published articles. Knowing the authors' identity encourages the reviewers to disclose conflicts of interest.<sup>10,15</sup> Newcombe and Bouton noted that the reviewers unaware of the seniority of the authors provide less educational comments for the inexperienced ones.<sup>16</sup>

A survey of medical editors showed that the identity of authors is masked in only 36% of cases.<sup>17</sup> In a survey of more than 3000 non-medical scientists, more than half supported double-blind review and only a quarter supported single-blind review. Double-blind review was primarily supported because of its objectivity and fairness.<sup>18</sup> In contrast to editors, more authors feel that double-blinding is important. Ecologists and evolutionary biologists too preferred double-blind review,<sup>6</sup> as did women and junior authors.<sup>19</sup>

A series of studies report positive findings for double-blind peer review. Budden et al found that introducing double-blind review led to an increase in submissions written by women.<sup>20</sup> Ross et al claim that blinded review negated the associations between abstract acceptance and nearly all abstract characteristics such as gender and institutional prestige.<sup>21</sup> Papers published in journals with double-blind review had a higher impact, measured by the number of citations; the authors attribute this to a type I error – that is, journals using non-blinded review published low quality papers, which would not have been published in the blinded peer review system.<sup>22,23</sup>

Improvements were not confirmed to large randomized trials.<sup>24</sup> Further, double-blinding is difficult to accomplish, since reviewers can identify the authors in some cases.<sup>25</sup> Clues like self-citation<sup>26-28</sup> and citing well-known studies often disclose information about the origin of the papers.<sup>29</sup>

### Public peer review

With the advent of the internet and modern information technologies, open access journals switched to interactive public peer review, in which a manuscript is open to comments by any visitor to the website where it is posted. Open review has some advantages. Submissions are immediately published online as “discussion papers”. Comments on the quality and authors' responses are open.<sup>30</sup> The reviewers' arguments are available to public, and reviewers can claim authorship in some cases.<sup>31</sup> This system may enhance the quality of manuscripts,<sup>32</sup> and encourages reviewers to submit constructive and fair comments.

In *Atmospheric Chemistry and Physics*, where interactive review is established, publication has two stages.<sup>31,33</sup> In the first stage, manuscripts that pass rapid pre-screening are immediately published online as “discussion papers”. Interactive public discussion is initiated, and the authors' responses to the comments are published along with the manuscript. In the second stage, revision and peer review are carried out as in traditional journals.

The disadvantages of the open system relate to the low prestige of open access journals and to the risk of acquiring “enemies” among the authors, threatening the fair attitude towards the reviewer.<sup>34</sup> Scholarly communications still operate within a relatively closed system, in which authors may later serve as reviewers and vice versa.<sup>32</sup>

### Other suggestions

Many European academics in non-anglophone countries, particularly in Italy, are marginalized because of the tendency of national journals to publish in English.<sup>35</sup> This marginalization was termed a “stigma” for non-native English speakers and has been discussed extensively by Flowerdew.<sup>36</sup>

To reduce the publication gap between scholars from countries of mainstream science and from the scientific periphery, access to publications and writing/editing courses should be expanded.<sup>43,44</sup> Moreover, encouraging young academics to participate in the peer review process may also have beneficial results.<sup>37</sup> As suggested by Mangelsdorf and Schlumberger in 1992<sup>38</sup> and practised in many American universities, reviewing classmates' compositions led to a more collaborative stance among students and sharpens their appraisal skills. It also helps them realize that peers' comments are instrumental for improving the readability of a text.<sup>39</sup> According to Loonen et al, acting as a reviewer is a recognition, which allows gaining knowledge and expertise, prerequisites for a good stance in the academic community.<sup>39</sup>

Journal editors can benefit from shortening publication timelines by encouraging authors to follow the current science writing guidelines.<sup>40</sup> Shashok has published a list of linguistic markers, which could help the reviewers identify content-based or language-based errors.<sup>41</sup> Likewise, Burrough-Boenisch points to the importance of close collaboration between linguists, copy editors, scientists/researchers, and journal editors.<sup>42</sup>

### Conclusion

These suggestions highlight the options for improving reliability, fairness, and predictive value of peer review. Blinding may reduce bias and may also provide fairness and better inter-reviewer agreement and predictive value. Transparency and fairness can be reached through a wider implementation of public peer review, relying on standard reviewer forms and digitization of the whole system of science editing.

**Competing interests** None declared.

### References

- 1 Bornmann L. Scientific peer review. *Annual Review of Information Science and Technology* 2011;45:199–245.
- 2 Bornmann L. Does the journal peer review select the ‘best’ from among the work submitted? The state of empirical research. *IETE Technical Review* 2010;27(2):93–96. doi: 10.4103/0256-4602.60162.
- 3 Ross PF. *The sciences' self-management: manuscript refereeing, peer review, and goals in science*. Lincoln, MA: Ross, 1980.
- 4 Eysenck HJ, Eysenck SBG. Peer review: advice to referees and contributors. *Personality and Individual Differences* 1992;13(4):393–399.
- 5 Eisenhart M. The paradox of peer review: admitting too much or allowing too little? *Research in Science Education* 2002;32(2):241–255.
- 6 Smit C. Peer review: time for a change? *Bioscience* 2006;56(9):

- 712–713. doi: 10.1641/0006-3568(2006)56[712:PRTFAC]2.0.CO;2
- 7 Wessely S, Brugha T, Cowen P, Smith L, Paykel S. Do authors know who refereed their paper? A questionnaire survey. *BMJ* 1996;313(7066):1185.
  - 8 Office of Management and Budget. *Revised information quality bulletin for peer review*. Washington, DC: Office of Management and Budget, 2004.
  - 9 Rowney JA, Zenisek TJ. Manuscript characteristics influencing reviewers' decisions. *Canadian Psychology* 1980;21:17–21.
  - 10 Working double-blind. *Nature* 2008;451(7179):605–606. doi: 10.1038/451605b
  - 11 Armstrong JS. Peer review for journals: evidence on quality control, fairness, and innovation. *Science and Engineering Ethics* 1997;3(1):63–84.
  - 12 Cox D, Gleser L, Perlman M, Reid N, Roeder K. Report of the ad hoc committee on double-blind refereeing. *Statistical Science* 1993;8(3):310–317. doi: 10.1214/ss/1177010904
  - 13 Brown RJC. Double anonymity and the peer review process. *TheScientificWorldJOURNAL* 2006;6:1274–1277. doi: 10.1100/tsw.2006.228
  - 14 Van Rooyen S. The evaluation of peer-review quality. *Learned Publishing* 2001;14(2):85–91.
  - 15 Primack RB, Marrs R. Bias in the review process. *Biological Conservation* 2008;141(12):2919–2920. doi: 10.1016/j.biocon.2008.09.016
  - 16 Newcombe NS, Bouton ME. Masked reviews are not fairer reviews. *Perspectives on Psychological Science* 2009;4(1):62–64.
  - 17 Good CD, Parente ST. A worldwide assessment of medical journal editors' practices and needs – results of a survey by the World Association of Medical Editors. *South African Medical Journal* 1999;4:397–401.
  - 18 Ware M, Monham M. *Peer review in scholarly journals: perspective of the scholarly community – an international study*. Bristol, UK: Publishing Research Consortium, 2008. <http://www.publishingresearch.net/PeerReview.htm>
  - 19 Budden AE, Aarssen L, Koricheva J, Leimu R, Lortie CJ, Tregenza T. Response to Whittaker: challenges in testing for gender bias. *Trends in Ecology & Evolution* 2008;23(9):480–481. doi: 10.1016/j.tree.2008.06.004
  - 20 Budden AE, Tregenza T, Aarssen LW, Koricheva J, Leimu R, Lortie CJ. Double-blind review favours increased representation of female authors. *Trends in Ecology & Evolution* 2008;23(1):4–6. doi: 10.1016/j.tree.2007.07.008
  - 21 Ross JS, Gross CP, Desai MM, Hong Y, Grant AO, Daniels SR, et al. Effect of blinded peer review on abstract acceptance. *JAMA* 2006;295(14):1675–1680. doi: 10.1001/jama.295.14.1675
  - 22 Laband DN, Piette MJ. Does the blindness of peer review influence manuscript selection efficiency. *Southern Economic Journal* 1994;60(4):896–906.
  - 23 Laband DN, Piette MJ. A citation analysis of the impact of blinded peer review. *JAMA* 1994;272(2):147–149. doi: 10.1001/jama.272.2.147
  - 24 Justice AC, Cho MK, Winker MA, Berlin JA, Rennie D. Does masking author identity improve peer review quality? A randomized controlled trial. *JAMA* 1998;280(3):240–2. doi: 10.1001/jama.280.3.240
  - 25 Smith R. Peer review: a flawed process at the heart of science and journals. *Journal of the Royal Society of Medicine* 2006;99(4):178–182. doi: 10.1258/jrsm.99.4.178
  - 26 Cho MK, Justice AC, Winker MA, Berlin JA, Waeckerle JF, Callahan ML, et al. Masking author identity in peer review: what factors influence masking success? *JAMA* 1998;280(3):243–245. doi: 10.1001/jama.280.3.243
  - 27 Godlee F. Making reviewers visible: openness, accountability, and credit. *JAMA* 2002;287(21):2762–2765. doi: 10.1001/jama.287.21.2762
  - 28 Snodgrass R. Single- versus double-blind reviewing: an analysis of the literature. *Sigmod Record* 2006;35(3):8–21.
  - 29 Falagas ME, Zouglakis GM, Kavvadia PK. How masked is the “masked peer review” of abstracts submitted to international medical conferences? *Mayo Clin Proceedings* 2006;81(5):705.
  - 30 Marris E. Journal lays bare remarks from peer reviewers. *Nature* 2006;439(7077):642. doi: 10.1038/439642b
  - 31 Koop T, Pöschl U. Systems: an open, two-stage peer-review journal. *Nature* 2006. <http://www.nature.com/nature/peerreview/debate/nature04988.html>. doi:10.1038/nature04988
  - 32 Borgman CL. *Scholarship in the digital age. Information, infrastructure, and the internet*. Cambridge, MA: MIT Press, 2007.
  - 33 Pöschl U. Interactive journal concept for improved scientific publishing and quality assurance. *Learned Publishing* 2004;17(2):105–113.
  - 34 DeCoursey T. Perspective: The pros and cons of open peer review. *Nature* 2006. <http://www.nature.com/nature/peerreview/debate/nature04991.html>. doi:10.1038/nature04991
  - 35 Giannone DS. Medical writing at the periphery: the case of Italian journal editorials. *Journal of English for Academic Purposes* 2008;7:97–107. doi:10.1016/j.jeap.2008.03.003
  - 36 Flowerdew J. Scholarly writers who use English as an additional language: what can Goffman's “Stigma” tell us? *Journal of English for Academic Purposes* 2008;7:77–86. doi:10.1016/j.jeap.2008.03.002
  - 37 Misak A, Marusic M, Marusic A. Manuscript editing as a way of teaching academic writing: experience from a small scientific journal. *Journal of Second Language Writing* 2005;14(2):122–131. doi:10.1016/j.jslw.2005.05.001
  - 38 Mangelsdorf K, Schlumberger A. ESL student response stances in a peer-review task. *Journal of Second Language Writing* 1992;1(3):235–254. doi:10.1016/1060-3743(92)90005-A
  - 39 Loonen MPJ, Hage JJ, Kon M. Who benefits from peer review? An analysis of the outcome of 100 requests for review by Plastic and Reconstructive Surgery. *Plastic and Reconstructive Surgery* 2005;116(5):1461–1472. doi: 10.1097/01.prs.0000178796.82273.7c
  - 40 Begg C, Cho M, Eastwood S, Horton R, Moher D, Olkin I, et al. Improving the quality of reporting of randomized controlled trials: the CONSORT statement. *JAMA* 1996;276(8):637–639. [updated 2010; cited 2011 Mar 30]. <http://www.consort-statement.org>.
  - 41 Shashok K. Content and communication: how can peer review provide helpful feedback about the writing? *BMC Medical Research Methods* 2008;8(3). doi:10.1186/1471-2288-8-3
  - 42 Burrough-Boenisch J. Shapers of published NNS research articles. *Journal of Second Language Writing* 2003;12:223–243. doi:10.1016/S1060-3743(03)00037-7