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Science fatigue

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Science fatigue

La fatiga de la ciencia

A fadiga da ciência

Luis Fernando Aragón Vargas [1]

Abstract: This editorial uses the image of fatigue in physically active people and athletes to briefly analyze some current challenges to science in general, and human movement science in particular. It offers practical and realistic solutions that could help science regain its vitality.

Keywords: science communication, scientific journals, research.

Resumen: Este editorial utiliza la imagen de la fatiga en las personas que practican deporte para hacer un breve análisis de los retos que enfrentan la ciencia en general y las ciencias del movimiento humano en particular. Se ofrecen algunas soluciones prácticas y realistas que podrían ayudar a que la ciencia recupere su vitalidad.

Palabras clave: comunicación de la ciencia, revistas científicas, investigación.

Resumo: Este editorial utiliza a imagem da fadiga em pessoas que praticam esportes para fazer uma breve análise dos desafios enfrentados pela ciência em geral e pelas ciências do movimento humano em particular. São apresentadas algumas soluções práticas e realistas que poderiam ajudar a ciência a recuperar sua vitalidade.

Palavras-chave: comunicação científica, revistas científicas, pesquisa.

Science is showing alarming signs of weariness. Exhaustion. Fatigue. Its credibility is constantly questioned by a humanity that, in the meantime, seems willing to accept any statement that makes them feel good, any information that resonates with the emotions of the moment. Legitimate leading groups are infiltrated by imposters who have found multiple loopholes to manipulate the system. In short, there are signs of fatigue in the integrity of science. And these signs are also evident in human movement science. Certainly, science is not the only reasonable source of knowledge, but it does play a fundamental role in the search for truth (Aragón Vargas, 2017). This editorial does not aim to provide a complete and in-depth review of the issue, but

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rather to highlight some of the problems facing science and propose a few practical solutions, particularly those related to scientific journals.

Reviewer fatigue. The peer review process, traditionally voluntary, is a thankless, generally unpaid task that is essential to the process of scientific communication. To complicate matters, the exponential growth of journals greatly exceeds the availability of good reviewers; publishers have been searching for new incentives for these key individuals who do the work of reviewing (Meyer, 2023; Meyer et al., 2023). The most powerful publishers can offer discounts or coupons as rewards for each review, which can be used when those individuals wish to publish in the publisher's journals. Meanwhile, emerging journals are limited to appeal to the goodwill of reviewers or, in some cases, to their desire for recognition in professional profiles that include not only publications but also the reviewing work. This search for new incentives is not working as well as one might hope. For example, in 2025, we received a manuscript at *Pensar en Movimiento* that was given expedited initial processing, but the peer review recruitment process involved a total of four people who declined to review, two who agreed to review but did not meet the original or extended deadlines, five who simply did not respond to the invitation to review, and two who finally completed the task. This took seven months. It is apparent that the current peer review system is fatigued.

According to the *Hong Kong Principles for the Evaluation of Researchers: Promoting Integrity in Research,* from the 6th World Congress on Research Integrity, the evaluation and recognition systems for researchers in academia should promote and reward behaviors that strengthen research integrity, such as reviewing manuscripts and research proposals for funding (Moher et al., 2020). However, there is enormous resistance to change, as illustrated by the process of reforming the Academic Regime and Teaching Service Regulations at the University of Costa Rica, which is hindering the possibility of breathing new life into the system.

Publishing model fatigue. We have moved from a publishing model in which costs were covered by subscriptions from professionals, libraries, and universities, but in which information was not available to everyone, to an open access model. In the latter, to cover publication costs, commercial publishers began charging authors article processing charges (the now infamous APCs). But this opened the door to a business model obsessed with profitability, or at least overly vulnerable to profitability pressures. The result has been an uncontrolled escalation of APCs, which easily exceed US$3,000 for a single article, raising serious questions about the destination of the money collected. This affects even some of the most prestigious journals. At the same time, predatory journals are emerging, both independent ones and those published by questionable publishers. These publish articles of dubious quality without undergoing rigorous peer review, in exchange for APC payments. The latter is not an isolated phenomenon: some journals have been labeled *paper mills*, a name that is much more suggestive due to its double meaning: (a) mills or paper factories, where paper is made from wood, (b) factories that produce manuscripts in industrial quantities. Major academic organizations have proceeded to remove some journals from their collections due to suspicions about the quality of their practices (Quaderi, 2023), although

the detection of predatory journals is still complex, delicate, and imperfect (Teixeira da Silva and Celles, 2023). Meanwhile, small journals or those belonging to public universities (and therefore part of non-commercial publishers), usually working with very scarce resources, must compete against those belonging to powerful commercial publishers. The publishing model (the ambient air) is contaminated with carbon monoxide; as hemoglobin (journals) has a greater affinity for this gas, not enough oxygen reaches science.

Author fatigue. When a research project has been carried out with meticulous attention to all the necessary authorizations and steps, and the corresponding manuscript has been carefully drafted for publication, it is extremely frustrating to encounter the all-too-common practice of journals rejecting submissions without even submitting them for peer review (so-called desk rejection). Canned, generic responses include:

> "Due to the extremely high volume of articles submitted to the journal, the editor-in-chief has requested that only manuscripts with a solid scientific design and high impact be submitted for review. Given the extremely high quality of research currently required for acceptance of manuscripts in [name of journal], we have decided not to submit this article for review (Journal 1)

Or

> After a preliminary review of your manuscript by members of the editorial team, it has been decided not to submit it for further external review or proceed with publication. We realize that this decision may be disappointing to you, but we can only publish a small fraction of all the manuscripts submitted to us. Therefore, we are forced to make difficult decisions such as this one (Journal 2)

The above are actual responses recently received by this author. The process is exhausting and does not contribute to improving the quality of the manuscript! Precisely for this reason, at *Pensar en Movimiento* we have taken seriously the task of providing sufficient feedback even to authors of manuscripts that do not pass to the peer review stage. This is our small contribution of oxygen to science.

Reader fatigue. The current system of rewards and opportunities pressures teachers and researchers to publish a lot and quickly. In this context, it is common to encounter the fact that no one wants to read, as we are all too busy publishing. The mandatory reading of original manuscripts to prepare the theoretical framework for research projects can easily be replaced by summaries obtained with artificial intelligence tools, which could contain errors and biases, in addition to bypassing the process of individual intellectual filtering of information—like air entering the lungs without being warmed or filtered by the respiratory tract.

Fatigue of individual and institutional integrity. The constant pressure to excel in academic indicators (e.g., Impact Factor and *QS World University Rankings*) has led to the corruption of some research networks and international collaboration (Richardson et al., 2025). Research networks have very laudable and relevant objectives, such as partnering for research and the exchange of knowledge, resources, and experiences that enable faster and more robust scientific progress. In our field, for example, there is the American Network for Research in Human Movement Sciences, RAICIMH (https://raicimh-18.wixsite.com/raicimh). Some of these networks, however, have succumbed to the onslaught of international indicators of academic quality—now quite distorted, incidentally—which has led to a tendency to move from collaboration to collusion. The trend ranges from seemingly innocent and covert practices such as "I'll cite you in my publications and you'll cite me in yours" to cases of systematic fraud in the manuscript submission process (O'Grady, 2025), impersonation of peer reviewers (O'Grady, 2017; Stigbrand, 2017), and the purchase of researcher affiliations (Méndez, 2023). This is similar to doping in sports: illicit means are used to improve performance because the system does not always encourage correct behavior.

Administrative fatigue. It is common to hear researchers complain about the time and effort consumed by increasing administrative complexity. When reading about great scientists from the first half of the twentieth century (for example, Dr. Clodomiro Picado Twight in Costa Rica), it is impossible not to think that perhaps a large part of their success was due to the fact that scientific work in those days was considerably simpler. I am not falling into the trap of thinking that "former days were better," but rather objectively recognizing the challenges regularly experienced by thousands of researchers. It is estimated that the average researcher in the US spends more than 40% of the time allocated for federally funded research on administrative and legal matters (National Academies of Sciences, Engineering, and Medicine, 2025). Current research requirements are, for the most part, necessary to ensure quality and the protection of human subjects. However, at least in Costa Rica, the demands far exceed the available resources in terms of time and personnel, causing undesirable administrative bottlenecks that undermine science itself. This is similar to how the low partial pressure of oxygen in the rarefied air of high mountains slows down the physical effort of climbers.

Visibility/relevance model fatigue. Some indexes such as *Scopus* have created a vicious circle of visibility and citation where, in order to be included, a new journal must have sufficient citations in the journals already present in the index, but in order to be cited by those journals, it is almost essential to be part of the index. The model suffocates new journals.

The scientific community could limit itself to tearing its hair out. However, while it should indeed tear its hair out, it must also take steps to rescue the value of science and, particularly, to protect it from current threats:

1. Universities and scientific societies must regularly review their policies to make sure they are encouraging the behaviors they desire to obtain. Academic regulations that promote

individual work and punish teamwork are totally unacceptable. Regulations should encourage not only team publication but also other behaviors such as peer review of manuscripts and research proposals, giving due recognition.

2. Universities that publish diamond open-access academic journals, in which readers are not charged to read and authors are not charged to publish, must include the cost of publication in their regular budget—in the end, someone must cover the expenses. This publication funding must be realistic and allow journals to compete internationally.
3. Legitimate subscription-based scientific journals should maintain a hybrid publishing system, in which accepted articles are published in the traditional model (available only by subscription) unless, after their acceptance, authors request open access publication and pay the corresponding APCs. This avoids the conflict of interest that arises when the acceptance of any manuscript involves more income for the journal.
4. Legitimate scientific journals, both traditional and Diamond Open Access, must have sufficient staff and resources to properly read and evaluate all submissions they receive. Even if a manuscript is rejected before peer review, the editor in charge has a responsibility to provide sufficient feedback so the authors can improve their work.
5. Researchers have an obligation to observe the highest standards of scientific integrity. Among other behaviors, they must read the research published in their field carefully and critically, and focus their work on the pursuit of truth and the dissemination of sound science, rather than simply seeking to climb the academic popularity rankings.
6. Universities, research centers, and institutes must provide the necessary resources—I am referring to time and structures, not just money—to promote research. In addition, they must address the relevant regulations in a manner proportional to the risks involved in any given project or procedure. For example, it makes no sense that Law #9234 in Costa Rica (Asamblea Legislativa de Costa Rica, 2014) requires that research on the effectiveness of nutritional supplements for athletes, widely available in supermarkets and convenience stores, must meet the same requirements as a clinical trial for the development and approval of a new drug.
7. The main global indexes of academic journals should continue to demand quality criteria in the publication processes for all aspiring journals, but they should break the vicious circle of visibility/citation by ceasing to require high citation levels in the initial stages of membership in the index, similar to what Web of Science has done with its ESCI (Emerging Sources Citation Index).

These measures, together with those that our readers may contribute, will make it possible to address in a timely manner some of the symptoms of fatigue that science is experiencing. We want to avoid the need to rush it to the intensive care unit in the near future.

Note. This editorial was translated from the original in Spanish with the assistance of DeepL.com. The author carefully read and corrected the translation and is personally responsible for the published product.

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