Ethics and inappropriate behaviors in research practice

Ética y conductas inapropiadas en la práctica de la investigación

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Abstract

An overview of different ethical aspects linked to the research and academic publication processes is presented. Some interactions between the components of the research system are described, which can influence in an inappropriate behavior of researchers when carrying out their work and publish their results. The main values and knowledge that should serve as a frame of reference for researchers to work honestly and make balanced, fair and legal publications, within a rigorous and clear academic style, are highlighted. Some of the main consequences of academic fraud are highlighted, and a call upon researchers is made to foster a culture of good academic practices for students during their training.

Keywords: authorship, arbitration, academic fraud, plagiarism, data manipulation.

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Introduction

This essay is aimed at those who do academic work, which includes, among others, the essays, thesis, application work, literature reviews, research articles, case studies and school assignments. For practical purposes, the term researcher will be used when referring to the author, man or woman, teacher or student, of such writings.

Researchers explore the frontiers of knowledge and learn more about the world and how it works; they choose the questions that guide their work, use the methods they consider most convenient to obtain answers; create or integrate networks within their scientific community and are respected by academia and society (1).

The fundamental value of science is the honest search for truth (2, 3), and its main work tool, research, is a social activity based on the collective trust of those who exercise it and integrate a scientific community of academic peers, who share a common interest around a specific area of knowledge.

For such communities, trust is a fundamental pillar, since their work is oriented, through research activities, to the generation, application or improvement of knowledge related to their field of interest (3). In turn, all research is based on the ideas, approaches and data obtained in other investigations and that have been published in specialized media subject to strict quality control, prior to publication, through the review by academic peers who act as strict arbitrators, to ensure that the information published is reliable.

The main means of communication of scientific ideas are scientific articles, which have enabled scientists to trust each other and each other's claims regarding a particular topic (4).

Thus, the one who investigates supports his work on knowledge that has been generated and published, by other researchers. That with the confidence that they have put all their effort and professionalism to generate it and have scrupulously taken care of every

detail of their research, publishing only facts that have been checked and verified.

1. Research system

The research system is comprised, at the risk of omitting some component, by an extensive network of interconnections between researchers, the institutions that give them employment, which contribute with funds, public or private, the magazines or editorials that publish their works, and the professional societies which group them (1).

In this system, responsibilities and obligations are acquired between the parties that constitute it. It is driven and fostered by public and private investments, and generates several products that include research results, the various uses of such results and the training of students (1).

a) Ethical aspects in the research system

Research generates knowledge and it is used by various sectors to make decisions supported on an informed basis. This relationship between researchers who generate data and knowledge, with users, raises various ethical problems that must be taken into account. Among the challenges of the research system policies are those of ethics in the collection, analysis and exchange of data. Framed as ethical, legal and social problems, these include, with respect to data and information:

- The requirement and scope of informed consent.
- Privacy protection.
- Confidentiality.
- Safety.
- Governance (ownership, use, publication, exchange).
- Its proper use by public and private organizations.
- The appropriate use of support systems for decision-making.

- Ethical difficulties in making decisions and making policy recommendations based on probabilistic, imperfect and even defective data (5).

All research, in addition to scientific rigor, must conform to certain basic principles that make up (3) the integrity of the research. This, understood as the active adherence to ethical principles and professional standards for the responsible practice of research (6), is based on the fundamental values of science: honesty, objectivity, openness, impartiality, responsibility and thoroughness. Sticking to them, it helps to ensure that the research company advances in knowledge (1).

These shared values serve to shape the behavior of everyone involved in the research system, and allow it to work. This means that research is planned, proposed, executed, reported and reviewed in accordance with such values, from which a network of responsibilities arises that brings together the system and allows it to generate scientific knowledge (1).

b) Integrity and values in research

Science is a human activity based on honesty agreed by its members and therefore produces reliable knowledge. Of the values that support science, honesty is the main one, because without an honest basis, openness, accountability and equity would not be possible. Dishonest science violates that agreement and therefore also a defining characteristic of science (1).

Therefore, integrity in research, we can conceptualize it as dedicated, honest, responsible, correct, neat, congruent, disciplined and supported by a scientific and technical preparation of the highest level of who investigates and prints the maximum rigor and firmness in his actions.

Therefore, a researcher with integrity always gives his best and tries by all the means at his disposal to do the right thing. As a scientist, he must develop a strong sense of ethical responsibility

and apply it at each stage of the investigation (6). It must be someone who can be trusted. He is not a perfect being, but his failures and errors must not be the product of carelessness or neglect.

The integrity of the research is reflected by producing legitimate works that comply with the conventions of form and style agreed upon and established for the written communication of academic products.

The value of truthfulness demands that the truth be told at all times (7). A researcher with integrity is aware of the unwavering commitment he has with the truth. That is why, when communicating with his peers, he is careful so that they clearly distinguish when he presents a proven fact of hypothetical speculation. He does everything he considers good for the advancement of knowledge within its scientific community, without affecting the interests of other researchers. He recognizes and discloses precisely the sources from which ideas and data embodied in his investigations have arisen.

2. Academic style

Robert Day (8) points out: «Writing well a scientific paper is not a matter of life or death; it is something much more serious». This statement is more than an occurrence phrase, it suggests something much deeper. What is communicated in science is knowledge, on which eventually, the life, security or welfare of thousands or millions of people may depend. The opportunity, clarity and visibility of a scientific communication goes hand in hand with the level of impact it may have.

The scientific researcher is required to submit a written report of what he did, why he did it, how he did it and what he learned by doing it. This must be done in a clear, precise and orderly manner. Clarity is the main attribute of scientific writing, which is a

two-way process, as it will be useless if it is not received and understood by the public to whom it is, intended (8).

For the scientific writing to be clear, it is necessary to comply with a series of agreements, consensus or conventions that have been developed over decades so that the reader can distinguish, without making mistakes, the facts of the assumptions. The original ideas of the author and the interpretations of the texts he read, as well as the textual extracts that he took from other documents, he presented them in his writing without any change.

Consequently, if you quote an excerpt textually, enclose it in quotes or follow the academic style standards necessary to make clear the source of origin and who the author of that idea is. It warns readers of his work not only of his achievements, but also of the limitations of his studies and he has an ethical responsibility to report the evidence that has been published and that are opposite to his own approach (9).

By paraphrasing the work of others, an *interpretation* of these works is made and then the ideas derived from such interpretation are written, with a proper structure, citing the original source; In addition, respect for the original idea will always be maintained, being careful in not misrepresent it. When making a paraphrase, the author *does not limit himself to writing the same thing with other words* (9).

Balanced, fair and legal writing

As it has been stated, for a researcher to do his job, it is necessary that his work should be documented in others already published that support him and allow him to build a frame of reference for his research. Therefore, when using the ideas, concepts and theories of other people, the researcher must explicitly acknowledge the sources consulted (3).

It is valid to use other people's work responsibly if this is done in a balanced, fair and legal way (10). What does this mean? Using a source or the works of a particular author in a balanced way

implies not exceeding the use of the ideas of such author, be it in extension, frequency of citation or proportion within the documentary support of the work. It is always better to have a work supported by different sources and authors, to enrich it with different approaches and experiences from different fields. In contrast, the works plagued by self-citation only show that the author does not see beyond his own limited experiences.

We use the ideas of others fairly when we inform the reader of the source of ideas through the resource of the quotation and reference (10). It should not be forgotten that, in academic research, the only benefit an author receives for his work is the recognition of his peers by citing him correctly (6).

In certain cases, in addition to the above, it is necessary not to infringe copyright, or other legal aspects related to the protection of personal data, professional secrecy, informed consent, the use of confidential, reserved or exclusive use information for armed forces, among others.

A resource that helps researchers protect the privacy of human subjects who participate in a biomedical, behavioral, clinical or other sensitive investigation is the issuance of a *Certificate of Confidentiality*. These certificates are mandatory and serve to identify the information or characteristics of a subject participating in the investigation and help to protect against legal claims, orders or judicial summons (11).

In addition to complying with the law, it is necessary to comply with the academic conventions of the discipline that are usually highlighted in the guides for authors who offer specialized journals, who are obliged to properly instruct their collaborators about authorship (3). These guides are not optional, they should be followed scrupulously, as they are intended to facilitate communication and avoid misunderstandings by conforming to conventions of linguistic logic and mathematical logic commonly used in the scientific community of the area. This can help to avoid violating the standards and values of academic work.

3. Research and collaborative work

After WWII, in response to the demand for a more efficient production of knowledge, the idea that researchers can work, rather than isolated, in collaboration, took hold. For this to happen, there are many reasons of scientific, technological, political and economic importance (12).

In this era of collaborative research, more and more scientists come together from different parts of the world to work as a team (3). The rapid growth of global research networks makes participating researchers involved in complex historical, political and economic associations. These are accompanied by practical ethical issues that arise in the investigation, such as the application of international guidelines related to informed consent, standards of care, access to post-test information, acceptable levels of risk, distribution of benefits, etcetera (12).

However, collaborative research reproduces relationships and conditions that tend to favor disproportionately high-income countries and institutions. Equality in collaborations is often undermined in aspects such as the order of appearance in authorship, financing, remuneration of staff, as well as the ownership of samples and data among other things (12).

4. Authorship

Authorship refers to the attribution of responsibility for the planning, implementation, analysis and publication of a scientific article. Everyone who appears in the list of authors of a scientific article must be responsible for all aspects published in it (3).

Authorship credit is the foundation of the academic career, of the author's prestige in the scientific community and the basis for research funding. For someone to be considered an author in a

publication, the International Committee of Medical Journal Editors (ICMJE) (13) emphasizes that four criteria must be complied:

- Have made a substantial contribution to the conception or design of the work; or in the acquisition or interpretation of the data for the job;
- Write or critically review the important intellectual content;
- Approve the final version that will be published;
- Take responsibility for all aspects of the work to ensure that questions related to the accuracy or completeness of any part of the work are properly investigated and solved.

5. Arbitrated journals and knowledge quality control

Specialized academic journals must assure their reading public that the scientific documents they publish are rigorous, true, reliable and in accordance with the strictest ethical standards (14). A very important role of the editorial committees is to verify that this is accomplished by acting, in the first instance, as strict critics of the collaborations that come to the magazine and that seek to be published (15). The documents that in their opinion could be published are sent to a group –usually a list of three specialized arbitrators so that they carry out–, in depth, a rigorous technical-scientific evaluation, which will determine if the document is published or not.

6. Inappropriate behaviors in research

Society has an idealized image of science. This is based on the theory that the scientific community is guided by rules incompatible with bad practices, such as selflessness and organized skepticism (16). However, some scientific researchers do not understand or have not thought about the ethical dimensions of their work.

An additional problem may be the disconnection between the ideals of science, current regulations and institutional reward systems operating in the system (1).

On some occasions, researchers are not attentive to the ethical aspects that may arise in their activities, or trust that they can identify and work on such aspects without training or specialized assistance. In other cases, they may think that ethical issues can *hinder* the progress of their investigations and evade them (1).

When those who investigate depart from the appropriate norms and practices of science, they fall into inappropriate conduct for research or commit other offenses that are detrimental to scientific practice. Fraud or misconduct in scientific practice must be discovered, exposed and penalized, not only by the scientific community, but also by the laws governing the subject, such as intellectual property,[1] copyright, legal registration, bioethics, etcetera (7, 9).

Involuntary errors in the design or interpretation of an investigation are not considered inappropriate behaviors (16).

a) The researcher and the human condition

It should not be forgotten that scientists are human beings and as such do not differ from the rest of society in their honesty. Consequently, in their work, as in that of other people, conflicts of interest, prejudices, ambitions, the need for recognition, the desire for personal promotion and even the search for financial help, affect. That is when the author can fall into the temptation of scientific fraud (2). Science does not select or mold especially honest people; It simply puts them in a situation where cheating is not helpful. It would be naive to pretend that, unlike other areas, the scientist is exempt from acts of corruption or bad practices. That is why the fundamental value of science must be taken care of, which is the honest search for truth (2).

b) Some consequences of academic fraud

When a researcher is careless, not very rigorous, or even worse,

when in his eagerness to complete an investigation and publish his results, he fails to state the truth, the knowledge he would generate will not only be useless, but also dangerous. Therefore, if another researcher would use it as a support for his investigations, he would do it on a false basis. In this way, all the time, resources and work invested in research would be compromised (16).

A fraudulent scientific work that has been published causes serious collateral damage. For example, some researchers may have based their work on the alleged findings, and now they will have to redo their work with the consequent loss of time, financial resources, work and a decrease in the trust of their funding institutions or agencies. In addition, those who arbitrated the fraudulent article lost time that could be devoted to evaluating honest work. The distinguished researcher, who in good faith wrote a favorable comment about an experiment that was not done, lost even more time and risked his prestige (17). The magnitude of the damage increases exponentially if the publication was made in a magazine of high visibility and impact, with a large number of readers who trust its contents, as well as the extent to which the fraud takes time to be discovered or even worse, if this one is not discovered.

c) Main faults that could occur

When investigating, some inappropriate behaviors may occur consciously or unconsciously. However, ignorance cannot be an excuse (6), it is not justified in those who wish to participate as authors or collaborators in the publication of scientific papers, or in those who assume the role of advisors. All of them should know that there are strict rules that must be fully complied with in academic communication. Acting with honesty and good faith is not just an obligation; it must be a hallmark of every university student (14).

Fraud is unacceptable and any scientist, be it a researcher, teacher, academic, entrepreneur, industrialist or who works in any other scenario where his main activity is science and who finds

that he has committed a scientific fraud will be exiled from the scientific community (7, 15).

Mario Bunge says: «A scientific fraud is not a crime that anyone can commit. It is a scam perpetrated with scientific expertise and in view of a scientific community. To commit it, it is necessary to know enough to deceive those who evaluate it» (17).

There are several ways to violate the values and standards of academic communication and that we must keep in mind so as not to fall into any of them. These failures should not be ignored because they are incorrect behaviors, both in the process of knowledge production and in the communication process through scientific publications. In addition, these failures threaten the quality of the publications, defile the prestige of the journals and damage the integrity of science, reducing its credibility. The main ones, which are not unique, are (10, 16):

- Forgery.
- Manufacturing or invention.
- Nepotism.
- Carelessness.
- Plagiarism.

Others include:

- Theft or misappropriation.
- Data manipulation.
- The «massage» of data.
- Fictional authorship.
- Errors in data collection.
- Errors in the preparation of the document.
- Errors in the publication process.
- Inflate the *curriculum vitae*.
- Scientific negligence.
- Sensationalism.
- Any other conduct that deviates from ethical standards (7).

Counterfeit. This occurs when the data or results of the work of others are misrepresented, distorted or deliberately distorted by who is citing them. It includes practices such as «makeup», «cooking» or «spooning» the statistical analysis so that they adjust and «validate» the results that you want to present (16). In the falsification the data or results of investigation, the equipment or processes are manipulated, results are changed or omitted in such a way that the investigation is well adjusted to what is expressed in its protocol or investigative record (log) (2).

The Making up. It refers to the invention of data, results or cases, as well as lying about facts or data of their own or allegedly published by others and thus record or publish them (2). Present speculations as if they were proven facts. In the history of science, we find shameless researchers who alter experimental facts to match their expectations.

Another unacceptable practice is the intentional inclusion of impertinent or irrelevant references to the content of the research, with the purpose of manipulating the impact factor of the publication or increasing the chances of it being accepted for publication (9).

Plagiarism. The copy of ideas, data or texts without recognizing their authors. Qualitatively, plagiarism differs from making up or forgery in the fact that it does not distort knowledge (16), but this does not diminish the seriousness of the fault, which is comparable to a robbery.

There is a wide spectrum of manifestations, which can be considered as plagiarism. Those are when incurring an infringement of intellectual property, carried out with the intention of deceiving the true contribution of the authors and the originality and novelty of the information (6).

Copyright can be transgressed without plagiarism when a large amount of text is cited from the same article or by including pictures or images of protected articles citing them, but without obtaining permission for their reproduction (6).

When teachers and students collaborate, mentors must be very careful in granting authorship to students who did contribute substantially to the study (9).

Carelessness or neglect. Give inaccurate, incomplete or wrong information in the bibliographic citations or in the list of references, so that, for the reader it is difficult or impossible to find the documents that are poorly referenced, which implies a great loss of time, anger and frustration (2, 10).

Before publishing something, the authors must crosscheck each one of their citations and references and ensure that each reference is cited correctly in the body of the manuscript. In addition, they should ensure that each component of the reference corresponds faithfully with the information in the original document (for example: The names and surnames of the authors, the year of publication, volume, number and paging, in the case of journals, the title of the work, edition number, editorial, country in the case of books). When applicable, the authors must specify the credit of those who first reported the phenomenon being studied (9).

Another form of carelessness is the disdain that researchers usually show in the face of the recommendations made by the journals in their guides for authors. Although it may seem a minor fault, not to comply with such recommendations, it is important to think about the time that is lost to the members of the editorial committees and the arbitrators themselves. This happens when the suggested order is not followed or when the data or information is presented in different formats to those that the magazine has explicitly requested.

Nepotism and other problems with authorship. It is necessary to create more awareness in the authors, about inappropriate authorship and unethical practices in peer review. The authorship criteria are described in the guidelines established by the International Committee of Medical Journal Editors (ICMJE), which, over the decades, have evolved and now require compliance with the four criteria cited in the section on Authorship (3).

Nepotism consists in citing references from colleagues that are not relevant to the work that is published (10). Only people who have made substantial contributions to the project may appear as authors or contributors to a publication. Guest authorship, academic or professional, is ethically unacceptable (9, 13, and 18).

A «ghost» author is one who, despite having made a substantial contribution to a published work, does not appear in the list of authors. On the other hand, an unjustified authorship is given to a «guest» author, who is included as an author, despite not having made an important contribution in either the design, research process or analysis of results or in the writing of the document. Both cases are unacceptable and lacking in ethics (2, 19).

The invited authorship transgresses academic confidence by giving a credit to a student who does not deserve it or allowing a researcher to obtain positions of responsibility or access to financial resources related to subjects that he does not know, but on which he theoretically writes. In both cases, this fraud puts those who work honestly in a disadvantageous situation (6).

By misrepresenting the contributions of the authors, improper authorship is a deceptive practice that can be equated with counterfeiting, making up and even scientific fraud (18).

Conflict of interest. There is substantial concern about conflicts of financial interest by clinical researchers that may prevent them from acting impartially and with integrity. Conducting clinical trials may compromise the well-being of research subjects and affect their safety or the results of the trial. Decisions such as the eligibility of a subject to participate in an investigation, the calculation of the dose of a medication, and the reporting of adverse events related to the intervention, when they occur, are difficult decisions to regulate or monitor (20).

A conflict of interest, or interests in conflict, occur when a person involved in multiple interests has an interest that interferes with another (21). Ghooi agrees with Field and Lo by pointing out

that «A conflict of interest is a set of circumstances that create a risk that, professional judgment or actions related to a primary interest will be unduly influenced by a secondary interest» (21, 22).

The National Research Ethics Advisory Panel of the United Kingdom (NREAP) offers a more complete definition of conflict of interest: «... a set of conditions in which professional judgment regarding a principal interest (such as patient welfare or research validity) tends to be unduly influenced by a secondary interest (such as financial gain)» (21, 23).

If a researcher has certain relationships with a company or organization, there is a conflict of interest, if the result of an investigation could lead them to benefit financially or commercially (21).

Authors are obliged to disclose to readers if they have consulting actions or agreements with sponsoring organizations, which may pose real or potential conflicts of interest (9).

d) Factors that favor scientific fraud

An old saying goes: *the occasion makes the thief*. For researchers, the Internet is an important tool that makes work easier. However, it has never before been easier to plagiarize the work of others, through the action of copying and pasting information from a website or an electronic document to use it forgetting, negligently or with bad intentions, giving the corresponding credits to the author (2).

The growing pressure to publish at all costs, to which researchers have been subject (6, 15), has had a negative impact on the work of editorial committees and arbitrators, who not only receive more material to review, but a growing percentage of it somehow deviates from ethical standards (14).

The Open Access movement considers knowledge to be a universal value and must be available to all for the good of humanity. Its greatest impact on global science is seen in the participation of scientists from developing countries (24). This movement has

brought important changes in the way in which academic publications are financed. Before, the costs of publishing journals were covered with subscriptions. Today, with fees charged to authors whose documents have been accepted for publication (25).

Although the Open Access model has, the advantage of making research available free, its payment system has created many negative secondary effects that are not foreseen. The foregone such as the emergence of hundreds of fraudulent publishers who are only looking to keep the money from quotas, inventing poor quality magazines –predators– where the work of well-intentioned researchers who believe in them, is lost (25).

It seems that the strong pressures to publish together with an increasing number of publications of doubtful prestige favor a lower quality of the published science (6) partly attributable to a poor, compromised or even absent peer review (in predatory journals)[2] (18) .

Conclusion. An ideal worth following

In order for our researchers to be distinguished by their quality and integrity, we must commit ourselves, as an institution, to improving practices related to research and publication. Strive to create an environment that favors integrity, by keeping the community informed about the aspects inherent in academic publication, which lead it to understand better the causes and consequences of violations of integrity (1).

As a University, it is essential that we train our academic staff and our undergraduate and graduate students so that they have awareness and knowledge of the ethical bases on which the various scientific communications are based (14).

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Bibliographic notes

[1] The intellectual property of a work is made of two types of rights: moral and economic (copyright). The morals are held by the authors for the mere fact of conceiving a work, are unwaivable and inalienable and accompany the author throughout his life. Among them, the right to recognition of the status of the author of the work and the requirement of respect for its integrity and non-alteration 6. ABAD-GARCÍA, M.F. *Plagiarism and predatory journals as a threat to scientific integrity.* Annals of Pediatrics. 2019; 90 (1): 57 e1-e8. Available in: https://doi.org/10.1016/j.anpedi.2018.11.003

[2] Predatory journals threaten the integrity of the scientific system by deteriorating the purposes of open access. They are damaging the reputation of reviewers and editors included in these journals without their consent, and of the authors (who «burn the publication of their work) but mostly because They compromise the quality of what is published by lacking adequate peer review processes, becoming a reservoir of scientific malpractice.