



Predatory journals: an enemy to be fought in scientific communication

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ABSTRACT

Introduction: Scientific production is a fundamental element for the reputation of a researcher and a university in such a way that the pressure to publish becomes increasingly prevalent in academia. **Objective:** We seek to analyze the growing phenomenon of predatory journals as a threat to the scientific universe and the ways in which they can be identified and avoided. **Methodology:** Based on the international literature, the concept, characteristics and ways of identifying predatory journals are discussed, in addition to some questions that can illuminate reflections on the ethical impacts that this reality has brought to the academic environment. **Results:** It is evident the need to face this threat through a joint action of authors (researchers), editors, teaching and research institutions, research funding agencies, and bibliographic databases in order to guarantee that scientific communication in the most diverse fields of knowledge is carried out in ethical, transparent and defensible ways. **Conclusion:** It is necessary for investigators to develop a specific competence to distinguish between reliable and fraudulent journals, disregarding invitations, which are often tempting, to publish or join editorial committees of predatory journals.

KEYWORDS

Predatory journals. Scientific communication. Information ethics. Scientific journals.

Revistas predatórias: um inimigo a ser combatido na comunicação científica

RESUMO

Introdução: A produção científica constitui elemento fundamental para a reputação de um pesquisador e de uma universidade de tal modo que a pressão por publicar se torna cada vez mais preponderante no meio acadêmico. **Objetivo:** Busca-se analisar o crescente fenômeno das revistas predatórias como uma ameaça ao universo científico e as formas para que possam ser identificadas e evitadas. **Metodologia:** Com base na literatura internacional, discute-se o conceito, características e as formas de identificação das revistas predatórias, além de algumas questões que podem iluminar as reflexões sobre os impactos que essa realidade vem trazendo ao meio acadêmico. **Resultados:** Evidencia-se a necessidade de fazer frente a essa ameaça por meio de uma ação conjunta de autores (os investigadores), editores, instituições de ensino e pesquisa, agências de fomento à pesquisa, e bases de dados bibliográficas no sentido de garantir que a comunicação científica nos mais diversos campos do conhecimento se faça em moldes éticos, transparentes e defensáveis. **Conclusão:** Torna-se necessário o

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desenvolvimento, por parte dos investigadores, de uma competência específica para distinguir entre as revistas confiáveis e as fraudulentas desconsiderando os convites, muitas vezes tentadores, para publicar ou integrar comitês editoriais de periódicos predatórias.

PALAVRAS-CHAVE

Revistas predatórias. Comunicação científica. Ética na informação. Revistas científicas.

CRedit

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1 INTRODUCTION

Scientific production presupposes – and demands – a whole effort regarding the construction of the article's content, authorship, sources, among others. Particular importance, in this context, lies in the careful choice of the scientific journal to which the article will be submitted, since the prestige and scientific visibility potentially associated with this intellectual production will depend on it.

The university, nowadays, is increasingly permeated by the “publish or perish” phenomenon, in which professors and researchers are constantly pressured to publish articles in order to guarantee their academic position, their eventual promotions, their prestige and even the maintenance of their job (MOOSA, 2018).

In this context, three factors end up being considered important for the success of a researcher: publishing continuously, increasing the number of citations and publishing in an “open access” journal (GRUDNIEWICZ, 2019; BEREK, 2020).

Nowadays, “Open Access”, in which the reader has free access to a journal's articles, can occur through the so-called Gold Model, with the article processing charge system financed by the author, by research institutions or libraries, or by the Green System in which the author self-archives a copy of his article for free access. There is also the so-called Hybrid System in which some articles in a journal are open access and others are not. (GUNAYDIN; DOGAN, 2015; SHEN; BJÖRK, 2015)

The submission of an article, as Guimarães (2018a) highlights, requires a set of precautions that must be taken when choosing the journal for article submission, as explained below.

The first attention to be taken refers to the scientific prestige of the journal based on national and international indicators, as is the case of its indexing in databases such as Web of Science, Scopus, Scielo, among others. In this context, aspects such as the impact factor and the quartile in which the journal is classified in a given area of knowledge are especially relevant.

It is also important to carry out a specific analysis of the journal's editorial scope, in order to verify to what extent the article's theme fits into the journal's policy, as this will influence not only the acceptance or rejection of the article, but also its reading, or not, by experts on that topic.

In addition to the editorial scope, the composition of the Editorial Board and the Scientific Body of the journal should also be analyzed, as the presence of prestigious researchers influences the visibility of the journal and, consequently, of the article.

Finally, attention should be paid to some formal aspects, such as compliance with the periodicity of the journal, the presence of thematic issues or dossiers, the languages accepted for publication, the mention, on the initial page of each article, of the date of reception and of approval of the article (as this attests to the journal's editorial agility), the data provided about the authors (including cases of journals that publish the author's photograph for future identification purposes) and the existence of a controlled vocabulary that provides subsidy to the establishment of the keywords for the articles.

As can be seen, this is a complex task, but it is decisive for the greater or lesser visibility of an article and, as a consequence, for the construction of the scientific reputation of the authors.

Cases of true “pearls thrown before swine” are not rare, that is, when articles of excellent quality, the result of exhaustive research work, are submitted to journals of little prestige. As a result, the knowledge produced runs the risk of being lost, since it will be little accessed and apprehended, making it scientifically little visible.

More recently, this task of choosing a vehicle that has prestige and scientific visibility for submitting an article has become more complex due to the growing phenomenon of so-called predatory publications.

Next, we present a historical overview of the emergence of the concept of predatory journals, as well as their main characteristics, in addition to offering some elements for researchers to identify them when submitting a manuscript for publication.

Thus, one of the contributions of this article is to increase the level of awareness of researchers themselves, so that they do not fall into these predatory forms of scientific knowledge. By becoming aware of the ways in which such scams take place, researchers can both protect themselves from this type of practice and maintain a safe and healthy environment for scientific communication.

2. PREDATORY JOURNALS: CONCEPT, CHARACTERIZATION AND FORMS OF IDENTIFICATION

Jeffrey Beall, librarian and researcher at the University of Colorado, Denver Auraria Library, now retired, noticed in 2008 that, after the large-scale implementation of the “Open Access” journal model, he began to receive numerous invitations to submit articles and integrate the editorial committee of unknown journals (BEALL, 2012).

In 2010, he coined the term “predatory publications” when he published on his Metadata blog a list of journals and publishers involved in unprofessional or unethical practices (BEALL, 2013). Started with a group of 18 publishers, it reached 923 in 2016 (NARIMANI; DADKHAH, 2017) and had great academic importance, providing subsidies for the identification of unreliable publishers (BASKEN, 2017; WATSON, 2017) to such an extent that the list has been recognized by the journal *Nature* (BUTLER, 2013a) as an important source for researchers, although it has been criticized for its limitation to “open access” journals.

Other denominations were used in the literature to name the phenomenon of predatory journals, such as pseudo-journals (MCGLYNN, 2013; LAINE; WINKER, 2017) or opportunistic journals (GREENBLATT; BERTINO, 2018). Others question this terminology and suggest naming them “bad faith journals” (ANDERSON, 2015), “misleading and low quality journals” (ERIKSSON; HELGESSON, 2018), or even prefer to use the terms “parody or mimicry” (BELL, 2017) to characterize them.

As of 2012, the list organized by Beall was transferred to his new Scholarly Open Access blog and was later expanded and organized into a set of four lists composing what is known as the eponymous “Beall List”. The first two listings list predatory or questionable publishers and predatory or questionable independent journals. The third is hijacked journals, ie spoofed websites that pretend to be from an established and reputable journal in order to attract paid manuscript submissions. Finally, the fourth list is of questionable companies that provide false metrics from researchers, articles or journals (BEALL, 2016).

The criteria used by Beall (2015) to characterize these publications were grouped into four main titles, namely: editor and team, business management, integrity and others. Thus, 48 topics are detailed, both for the editor and for the journal. It is worth noting that these criteria recognize the principles of conduct for editors and transparency for journals of the Committee for Ethics in Publication (COPE).

The Beall List (BREZGOV, 2019a) was a pioneering initiative to document and list journal editors in “Open Access” that did not meet the requirements of the “peer-review” system and published any article as long as the author paid for it. It ended in 2017, perhaps due to legal demands and pressure from large publishers (STRAUMSHEIM, 2017; SILVER, 2017). After that, in the same year, a postdoctoral student at a European university made Beall's List

available on a new website, but preferred to remain anonymous fearing suffering the same threats that Beall had received (ANONYMOUS, 2022).

In the gap left by the Beall List, still in 2017, the company Cabell's International created a database of predatory and non-predatory journals in the form of a negative list (Predatory Reports) and a positive list (Journalytics). However, its access is paid as detailed on the Cabell's website (2022). However, as Akça and Akbulut (2021) refer, there is no consensus on the criteria used to determine fraudulent journals. Other studies, such as those by Silva and Tsgaris (2018) and Dony *et al* (2020) also criticized the lack of rigor in applying these criteria and the reliability of this type of listing. That is, there are several black and white lists circulating in academia, but they all have imperfections. In addition, it is necessary to pay attention to the presence of false positives in these lists, since potentially predatory editors choose titles that are very similar to those of existing journals (NELHANS; BODIN, 2020).

In Beall's (2013) view, one way to face the problem of predatory publications, which is not restricted to the academic publishing industry, is to invest in what he called "academic editorial literacy". This should include researchers' ability to recognize and prevent publication fraud, as well as the development of librarians' skills beyond the primary literacy level, with a view to gaining additional experience in scholarly communication to add value to information available online and raise awareness of pitfalls of predatory publications. Beall (2017, p.278) argues that academic library science needs to "wake up to the problem of predatory publishers and be faithful to library users who seek help and advice on scholarly communication".

Initiatives in this direction have already been taken in several libraries in the United States. For example, academic librarians at the universities of Iowa (O'DONNELL, 2016) and Wichita (WALKER, 2020) have published online guides aimed at the scientific community to identify potentially predatory publishers, which stand out for intentional acts that exploit the academic need to publish and aim to deceive those who use their services, as detailed in Chart 1, below.

Quadro 1. Tipos de editores potencialmente predatórios

Types	Modus Operandi	Characteristics
<i>Hijacker</i>	It presents itself as a well-established journal or as a publication associated with a well-known brand or society.	Often add an extra word to the name of an existing journal, such as "Advances", "Reviews", or "Reports", or create websites that appear to be affiliated with another publication
<i>Phisher*</i>	It lures potential authors with promises and charges large fees after the article is accepted. Persistent, they may demand payment even if no copyright agreement or contract has been signed.	It presents itself as a well-established journal or as a publication associated with a well-known brand or society.
<i>Papermill</i>	Mass production of poor quality work made to order, often through machine learning or plagiarism. Unlike other types of predators, article factories are meant to deceive readers and editors, not authors.	Authorship is purchased. Authors may have little or no actual experience related to the subject being published. The article text may be full of "tortured phrases" common in machine learning writing or appropriated from someone else's work.
<i>Trojan Horse</i>	It has a legitimate looking website, but upon closer inspection, nothing is what it seems. Journals are 'empty shell' or	Difficult to identify. The publication history, frequency and quality of the article should be examined.

	worse, populated by stolen articles, plagiarized from other reputable journals, or nonsense.	
<i>Unicorn</i>	Too good to be true! They claim to offer services – rapid peer review, indexing in databases, impact factors, etc. – but they don't.	Similar to 'phisher' but intentionally misleading about their services but not pricing.

Source: Elaborated by the authors

* Comes from the English neologism 'phishing', in allusion to the act of throwing a line and waiting for the bait to be bitten. In the context of predatory journals, it can be understood as a "fraudster", that is, someone who sends "phishing" emails requesting articles and/or invitations to join the editorial team.

It is worth noting that other resources are available online for researchers to protect their work before submission, helping to choose legitimate and reliable journals, such as the website <https://thinkchecksubmit.org/> (2022). This is an international initiative supported by publishers and scholarly communication organizations to promote integrity and build trust in credible research and publications.

It is interesting to note that predatory journals, by using subtle strategies to cover up their lack of scientific seriousness, often end up being listed in journal evaluation systems. In the case of Brazil, this theme has also been the object of an approach on the Preda Qualis website (<https://predaqualis.netlify.com/>) by Prado, Kraenker and Coutinho (2017), whose focus is the analysis of potentially predatory journals that are inserted in the Qualis/Capes database, based on elements such as the lack of adequate evaluation (independent, blind, and by peers) of the submitted manuscripts, with due monitoring by a scientifically authoritative editor, often resulting in a very rapid acceptance, due to a superficial and light evaluation criterion. However, the publication of an article in a predatory journal is not an intrinsic indicator of poor quality of its content, but its credibility can be questioned due to the vehicle used (PRADO; KRAENKER; COUTINHO, 2017).

In turn, Perlin, Imasato and Borenstein (2018) analyzed the penetration of predatory publications in the Brazilian academic system and the profile of authors in an empirical cross-sectional study of publications by Brazilian researchers from all disciplines during the period 2000-2015. Among the results obtained, the study showed that although predatory publications represent a small proportion of the general literature, they have grown exponentially in the last five years. The research also revealed that potentially predatory journals were listed in Qualis/Capes, denoting that this insertion can encourage this type of journal to receive more publications. These authors gathered evidence that experienced researchers with a high number of non-indexed publications and doctorates obtained locally are more likely to publish in predatory journals, contrary to the idea that young and inexperienced researchers are the main audience of these journals.

Brazilian research funding agencies, despite presenting guidelines and codes for good scientific practices, still do not provide guides with guidelines to avoid potentially predatory publications. Despite this, Pesquisa Fapesp magazine published between 2016 and 2022 about 20 articles addressing topics related to predatory publications. Thus, the agency has contributed to alerting and making readers and the scientific community aware of the importance of avoiding the pitfalls of unscrupulous journals that are driven exclusively by profit.

Still in the context of actions taken to inhibit potentially predatory publications, it is worth mentioning other initiatives that already exist in the Brazilian scientific academic scenario developed by scientific associations, higher education institutions and Brazilian scientific journals, as explained below.

For example, ABEC - Brazilian Association of Scientific Editors created the "Predatory Journals Working Group" with the aim of identifying Brazilian journals that present characteristics of predatory publications with a view to the principles of transparency (BARATA, 2021).

Another important action in combating the threats of these fraudulent publication models was undertaken by the Dean of the Universidade Estadual Paulista (Unesp) in 2018, with the creation of Propetips, a program to support researchers on good practices and issues related to scientific integrity, which address several topics, including the identification of predatory journals (GUIMARÃES, 2018b).

Equally assertive initiatives in tackling this phenomenon that has negatively affected the scientific community have been taken by scientific journals that began to include in the "instructions to authors" warnings to "not cite predatory journals, even with Qualis" (RPCFO, 2022), as well as "avoid citing studies published in predatory or potentially predatory journals" (REDCPS, 2022) in addition to indicating the consultation of the Beall List for foreign journals and the Preda Qualis website for Brazilian journals.

Such actions need expansion with the adhesion of other journals to face the growing variety of tactics used by predation.

Bearing this reality in mind, Chart 2 outlines a set of indications that can help to distinguish legitimate journals from potentially predatory ones, based on Guimarães (2018b) and other authors (BUTLER, 2013B; BARTHOLOMEW, 2014; SHEN; BJORK, 2015; REPISO, 2016; ERIKSSON; HEGELSSON, 2017; RICHTIG *et al*, 2018; MOOSA, 2018; SHELOMI, 2020).

Chart 1. Types of Potentially Predatory Publishers

Elements	Signals
Site	Poorly prepared, with grammatical or spelling errors, images and logos of low quality or resolution, and content of a more promotional nature, focused on ease of publication. Displays advertisements of a non-academic nature. Mimics websites of well-known journals. Dead links.
Location	Office locations are hidden or faked. They advertise headquarters in the US or UK, locations of the most influential English-language journals, but are often located in other countries.
Contact	Only by online form, without valid information (phone number, address), with free non-institutional business email addresses.
Title	Misleading or ambitious, with strong resemblance to journal titles of effective weight and scientific impact in a given area to mislead the researcher (eg American Journal of XYZ, which can be confused with a legitimate journal such as Journal of the American Society for X Y Z).
Chief Editor and Editorial Board	The editor is not a member of any recognized professional organization committed to best publishing practices, such as COPE. It does not clearly present the institutional affiliation, the scientific qualification of the editor-in-chief and the members of the editorial board, and does not display their respective e-mails.
Scientific Body	Comprised of non-existent researchers, or from institutions that are little known scientifically and from areas that are often disparate. They use the names of prestigious researchers without permission (fake editorial boards). There is no scientific background of the editor-in-chief and members of the editorial board in academic databases.
Submission	Absence of a professional system for sending manuscripts. Submissions are made via an email address with a commercial domain (eg Gmail, Yahoo, etc.) rather than an institutional domain. Guidelines for authors are vague with regard to the structure and standardization of papers to be submitted.
Editorial process	There is a lack of transparency about the processing of manuscripts. There is no specific information about submission dates and acceptance of publication, absence of digital preservation policy on archiving articles for later access.

Focus and scope	Wide thematic coverage, without making its areas of expertise clear, facilitating the receipt of articles from the most different disciplines and approaches. Excessively broad scope, including "advances, research results and practical applications", "in any aspects in area X" and "in topics related but not limited to", covering long list of topics.
Peer review	Missing, inadequate or fabricated. Rapid acceptance of the article, usually after submission and payment of fees, compromising scientific quality.
Indexers and metrics	Reference to the Index Copernicus Value, repeatedly criticized by the international scientific community as an indexing base, due to unethical practices. High impact factors based on false and misleading citation metrics.
Editorials	When they exist, they are generic, without a more verticalized scientific analysis of the set of articles published there.
Articles	Display typographical and factual errors. They are beyond the scope of the journal. They may, for example, be non-academic, allowing for obvious pseudoscience.
Article processing charge	Values often high, not mentioned or prominently displayed, only revealed after acceptance of the article. Charge of shipping or handling fee even if the article is not accepted.
Disclosure and Marketing	Aggressive invitation policies for researchers, by e-mail, with short response times, for them to submit articles or to join the editorial board.
Publication standards	Lack of proofreading and editing. False ISSN, incorrect or missing DOI, unverifiable ORCID.
Ethic	There are no policies on retraction, plagiarism checking, self-plagiarism, manipulation and unauthorized use of images and illustrations. They re-edit text without the author's permission.
Editions	Large volume of publications in a single issue. No regularity, and the publication schedule is not clearly defined.
Copyright	The magazine owns the copyright of the work. It does not incorporate a Creative Commons license.

Source: Elaborated by the authors

All this is combined with a sophisticated and growing strategy to give the appearance of scientific credibility to unethical editorial operations, which makes the identification of such journals increasingly complex. As a consequence, it can be said that investigators become victims of a perverse system insofar as they have their production published in a non-reputable vehicle, in addition to the fact that many times their name as a member of an editorial body is used falsely and without their authorization.

The trademark of these journals are the aggressive invitations to publish and join the journal's editorial board. These are usually done with flattering messages sent by email to a large number of individuals to attract researchers (RICHTIG *et al*, 2018).

The case of "Dr. Fraud" illustrates aspects of this predatory practice and shows the fragile credibility of predatory journals. It was a secret experiment that was carried out by Polish researchers (SOROKOWSKI *et al*, 2017) to test the suitability of hundreds of publications that present themselves as legitimate scientific journals, and exposed the way these journals operate.

The initial of the middle name (Olga) and the last name of "Dr. Anna O. Fraud" form the Polish word *oszust* which can be translated as fraudster or cheater. This fictional scientist made startling discoveries by offering herself as editor to 360 titles of legitimate and allegedly predatory publications by submitting a bogus and inconsistent resume with no published articles and no experience for the intended position.

The study revealed that 15 journals on the Beall list, 45 on the DOAJ, and 48 journals on the JCR responded to *oszust's* request but did not make him an offer. In addition, a few journals questioned her qualifications for the position, none made attempts to get in touch with the false institution with which she mentioned having a connection, and surprisingly many turned out to be more mercenary than expected, conditioning her nomination as publisher to some form of payment or profit. For the authors of this experiment, the solution to the problem of predatory

publication is to attack its essence. This will only happen when academics evaluate the qualities of journals and reward best publishing practices, in addition to no longer seeing the advantage of publishing in journals of this type.

It is worth noting that this experiment, despite requiring the application of a fraud, was approved by an Ethics Board, and the authors resigned from the editorial boards that accepted the fictitious Dr. Fraud.

In this context, Chart 3 presents messages recently received by the authors of this article by e-mail, which indicate predatory tactics to attract and exploit researchers.

Chart 3. Messaging with predatory tactics

Example 1 - Call for Research Articles (Journal name) will cover all areas of the subject. The journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence, and will publish: original articles in basic and applied research, case studies, critical reviews, surveys, opinions, commentaries and essays. We invite you to submit your manuscript(s) for timely publication in our next issue to: (email account: gmail or yahoo) Our objective is to inform authors of the decision on their manuscript(s) within three weeks of submission. Following acceptance, a paper will normally be published in the next issue.

Example 2 - Hi, greetings from the editorial desk of Journal XXXXX. We offer both online publication as well as journal hard copy options. Manuscripts submitted within this month will be eligible for discounted publication charge of YYY USD. Original publication charge is YYY USD after this offer period. This journal follows highly respected OPEN peer-review system Fast manuscript processing: Review decision: 7-10 days and publication: 12-14 days.

Example 3 - Get to know the XXX JOURNAL (<http://www.xxx.com.br>) DOI per article. Also prepare Review type articles for your area of expertise, because it will have greater visibility for the publications. BE A REPORTER OF THE JOURNAL XXXX - Technical-Scientific Committee of Doctors to verify and evaluate articles. Website in multiple languages (select language on the left side of the screen). Multidisciplinary Journal MONTHLY PUBLICATION - Authors are informed about the result of the evaluations. If approved, the author makes the payment, sends the proof, then we will send the article evaluations. For more information: www.yyy.com.br

Example 4 - Fast and quality publication in international journal. Dear Researcher /Scholar / Professor / Scientist, XXX Journal is an international open access double reviewed, peer reviewed monthly print journal. (...) It aims to original research findings that are suitable for many developing country including India. Author notification within 3-4 days after submission. SUBMIT YOUR PAPER

Example 5 - Dear authors, congratulations for the excellent article xxxx, published in the X Meet xxxx. In this sense, we invite you to publish your article in the XXXX journal evaluated by the new unique Qualis Capes as B2, in 2019, and indexed in several databases.

Source: Elaborated by the authors.

The “harassment” of researchers, as shown by the data in Chart 3, even extends to works that have already been published in annals of events or even in other journals. This predatory publishing market has expanded in recent years through publications that are called “vanity press” or “vanity publishing” (ERIKSSON; HEGELSSON, 2017; ANONYMOUS, 2020; MCNULTY, 2020).

Among the modalities for attracting publications are books and book chapters originating from works to obtain undergraduate, masters and doctoral degrees, targets of an editorial model that adopts charging to publish by paying fees – “paid, published” – and the requirement to transfer copyright. In addition, the publication process does not go through peer review or editing (formatting, spell checking, etc.), and marketing and distribution are the responsibility of the authors. Physical copies of these books are outrageously priced, and the authors, of course, receive no revenue from sales.

Still within the scope of what Eriksonn and Hegelsson (2017) called “false academia”, it is worth noting the fraudulent conferences. These are an identical scourge to predatory publications that challenge the reputation and legitimacy of scientific knowledge.

This type of event follows the same “recipe” as predatory publications (BOWMAN, 2014; ASADI *et al*, 2018; IBRAHIM; SHAW, 2020). Invitations and submissions are encouraged through widely distributed emails. They are not organized by scientific societies, but by for-profit event organizers. They use the names of researchers and scientists without their permission to attract participants. Describe the event as “World” “Global” or “International” “Conference” followed by a general title. The event is deceptively similar in name to traditional events well known to academics. Scientific committees are composed of unknown people who do not have a recognized position in a given scientific field. Information about programs and activities, plenaries and keynote speakers is vague and incomplete. The peer review process is non-existent or unusual, with a few hours gap between submission and acceptance. These conferences offer false indexing information in the database of prestigious publishers, often copying their logo. Recruitment of speakers is carried out by email and after acceptance they charge a fee for the privilege. They offer the option of receiving a certificate after payment of the registration fee and in case of non-attendance. Repeatedly make changes to important dates, such as application and submission deadlines or even the date of the conference. Refunds of registration fees are refused if the conference is cancelled. The payment of the registration fee is made through deposits in personal bank accounts.

Furthermore, the theft of identity of researchers listed without authorization in these predatory conferences can affect the academic and professional integrity of those involved. Ibrahim and Shaw (2020) suggest that legal actions could be taken against the organizers of these conferences, as they fail to provide advertised services, as well as being implicated in identity theft, copyright and trademark infringements, and other forms of unethical practices that affect the academic and professional integrity of those involved. However, the authors recognize the difficulty of appealing to a court, as usually the organizers of these conferences, as well as predatory publications, operate on non-existent platforms.

The “raison d’être” of predatory conferences is quite clear: to deceive researchers with false information and make money from the fees charged. The results of these unethical practices can include wasted time and resources, inadequate records in the researcher's curriculum, and costs to the researcher, and/or to the university and funding agencies that financed the payment of fees. In short, the quality of scientific knowledge is sacrificed for profit.

However, as noted in a Nature editorial (2018) regarding predatory journal lists, most scientists and science policymakers would agree that it is good to condemn such publications, despite the fact that it is difficult to distinguish them from those that operate in good faith but who may have published some shoddy or fraudulent research because of shortcuts in editorial decision-making, because scientists misled them, because of lapses in judgment, or because people simply make mistakes.

In the next section, with the aim of complementing the analyzes from the scientific literature on this phenomenon that affects the academic world, some issues generated by predatory publications are examined.

3 THE PREDATORY PHENOMENON IN SCIENTIFIC COMMUNICATION: OTHER VIEWS

To better scrutinize the consequences of predatory publications in academic science, it is worth making use of a theoretical-analytical toolbox composed of sociological contributions from the social dimensions of science and quantitative studies of science and technology that focus on the products of science through bibliometrics and the scientometrics.

In view of this, it is worth recalling the Mertonian concept of science, a collective enterprise whereby research is conducted by a scientific community of professional scientists, with scientific knowledge resulting from the common product of their similar activities. Based

on this understanding, Merton (1973) formulated a set of beliefs and values legitimized in terms of institutional values, which govern the activities of scientists, the scientific ethos. This Mertonian ideal type that illuminates the actions of scientists is composed of the norms of communism, universalism, disinterestedness, organized skepticism, originality and humility. Expressed in the form of prescriptions, permissions, preferences, and prohibitions, these norms are considered binding on scientists and conveyed through guidelines and examples, while providing an unambiguous frame of reference for evaluating the conduct of scientists.

To examine the (lack of) peer review in predatory journals we selected from this normative set organized skepticism, the methodological and institutional mandate by which scientists must remain skeptical about the results of their research, including its possible shortcomings, and expose themselves to the criticism until all the facts are established. This calls for caution with regard to conclusions, avoiding the conviction that they have something more to offer than discoveries that are tentative inconclusive.

Now, if in predatory journals there are no arbiters in charge of assessing the validity and value of manuscripts sent for publication, as well as if editors and editorial staff who should make the final determination of what should go into the science archive do not do it, it consequently rules out criticism. That is, “the temporary suspension of judgment and impartial scrutiny of beliefs in terms of empirical and logical criteria” (MERTON, 1973, p. 277) is not required. Therefore, scientific research is prevented from being “under the rigorous scrutiny of fellow specialists, usually involving, although not always, the verifiability of results by others”, while avoiding “personal honesty supported by the public and testable character of science” (MERTON, 1973, p.311).

Another consequence of the lack of peer review in predatory journals that overrides the norm of organized skepticism is the publication of articles that spread false information. This calls into question scientific credibility and interferes with the contribution to the knowledge base (MARSON; LILLIS, 2022). As these authors point out, internal reliability studies for journals are the first line of defense against predatory journals. The imperative of organized skepticism is important for analyzing these publications, since any contribution to scientific knowledge needs to be subjected to scrutiny. By constituting a directive requirement for scientists, organized skepticism also generates a climate of mutual responsibility, leading scientists to constantly give critical weight to the work of their colleagues (FIJALKA, 2020). However, the lack of certainty about the quality and authenticity of knowledge published in predatory journals means that the touchstone of authentic science, the norm of organized skepticism, is no longer applied.

Still under the aegis of Mertonian sociology, but from the perspective of the reward system of science, it is worth commenting on the motivation that lead authors to publish in predatory journals. Effects such as “publish or perish” are usually invoked as a reason for publications related to financial incentives arising from career promotions. However, as Hladchenko (2022) points out, scientists are not only motivated by financial rewards, but also strive to promote knowledge and receive recognition from the scientific community. That is, scholars' publishing practices are related not only to financial incentives, but also to intrinsic and reputational reasons.

This context includes the “Matheus Effect”, a concept elaborated and improved by Merton (1968, 1988), whereby already successful scientists tend to receive disproportionately high recognition or rewards – for example, citation and visibility rates, resources, access to infrastructure and reputation – when compared to their less prominent counterparts. That is, highly recognized researchers tend to maintain a high level of peer recognition, despite future activities (MARCOVICH; SHINN, 2011).

Thus, any reward system operating in society will produce an unequal distribution of the currency it deals with, be it money, power or esteem, and it is always a timely question to inquire into the consequences of this fact for the people and for the institution in question. This

argument by Storer (1973) provides the reading key to understand that it is not just young researchers who are subject to publishing in predatory journals pressured by “publish or perish” in search of career promotions. The science reward system also affects researchers who have already achieved prestige and scientific recognition, as fame and power may not be enough – the more they accumulate, the more they feed prestige and expand the advantages (SILVA, 2021a) – even for those who they have already reached the top, regardless of whether the “price” paid for it is to publish in magazines with a predatory profile, much less if this distorts the recognition obtained, once it was achieved through false bases.

This situation leads to the problem of citations by contamination, which occurs when “articles published in predatory journals are cited in legitimate scientific literature” (MOUSSA, 2021, p.7). Such citations are unacceptable (GASPARYAN *et al* 2015) and avoiding them is not only the responsibility of editors, but also of bibliographic databases, which must play an active role in strengthening the quality control of indexed articles and journals (FRANDSEN, 2017). Seeking to deepen this discussion, Brainard (2020) reported the existence of studies showing that articles in predatory journals receive little or no citation.

It is worth mentioning yet another concern regarding the inclusion of articles published in predatory journals in research that uses bibliometric or scientometric approaches and in review studies. Such articles may pose a threat to these methodologies, as their quality is questionable as they have not been peer-reviewed and are more likely to be impacted by fraud and error compared to articles published in legitimate journals. As argued by Munn *et al* (2021), this constitutes a threat to the validity of systematic reviews and other types of evidence summaries, as these reviews support reliable recommendations to guide policies and practices. Despite this, there is little guidance on how these articles should be handled in these types of studies. The same occurs with scientific literature analysis research carried out with bibliometric and scientometric approaches. Articles published in predatory journals may contain errors and fraud, and their inclusion in these types of studies may compromise results such as inflated citation counts, biases in production rankings and scientific productivity, etc. causing negative impacts on the data and reputation of the author who produces these metrics.

Another problem related to scientific recognition is acknowledgments inserted without the consent of those who receive them inserted in articles published in predatory journals. That is, what would be the implications for those who are thanked, since acknowledgments reveal cognitive influences (CRONIN, 1991) and can function as a kind of endorsement of ideas presented by trusted advisors. Or even, acknowledgments to prominent people in their scientific field (BEN-ARI, 1987) suggest attempts to make a good impression and strategies to build identities and credibility. These are questions to be explored in future studies.

Finally, a final comment on authors who publish in predatory journals and are identified as coming from countries in the “Global South”. As Silva (2021b) argues, the adoption of this terminology should be avoided, as it may represent a kind of non-academic discrimination. Furthermore, the study by Moher *et al* (2017) showed that in a sample of 1,907 articles published in more than 200 predatory journals, predatory publication is not limited to developing countries only, because although most come from India, more than half of the articles have authors from higher-income or upper-middle-income countries, as defined by the World Bank, such as the United States, Japan, Italy, and the United Kingdom. Furthermore, it was found that 17% of the articles that reported a funding source the US National Institutes of Health (NIH) was the most frequently named source. The United States produced more articles in this sample than all other countries except India.

As O'Donnell (2020) noted in her online guide's legal notice on predatory publications, scholarly publishing conventions are deeply tied to academic imperialism and colonialism, recognizing that scholars from the 'Global North' are published more often than the authors of the 'Global South' due to better support, funding and infrastructure. For example, the dominance of English as the language of choice for most commercial academic publishers – most of whom

are based in North America and Europe – introduces a language barrier for those who do not speak it, as well as the assumption of Internet access. That is, when predatory publications are addressed, the geopolitical position of countries cannot be treated superficially, under the risk of superficiality or discrimination.

Therefore, there is still much to be studied when questioning predatory publications.

4 CONCLUSION

Predatory journals have brought a growing and worrying scenario to the academic universe, with ethical impacts¹ that affect scientists, institutions and editors, causing reputational damage of various orders.

In order to face this threat, it is necessary to have joint action by authors (researchers), editors, teaching and research institutions, research funding agencies, and bibliographic databases in order to guarantee that scientific communication in the most diverse fields of knowledge is done in ethical, transparent and defensible ways. This presupposes, on the part of investigators, a specific competence to distinguish between reliable and fraudulent journals, disregarding invitations, which are often tempting, to publish or join editorial committees of predatory journals.

In this way, not only will they be reinforcing the deserved reputation of journals that strive for the ethical conduct of their editorial² process, but they will also protect their academic image, ensuring that knowledge is disseminated as a contribution to science and not as a profitable commodity for unscrupulous publishers.

Ultimately, the proliferation of predatory journals will also bring harmful consequences to readers who, from a “melting pot” of reputable and disreputable publications, may reduce their confidence in the scientific literature (FERRIS; WINKER, 2017).

Concerned about this issue, many academic institutions have inserted, in their selection processes for professors and researchers, negative evaluation criteria for candidates who maintain relationships with this type of publication, either as an author or as a member of the editorial board (LINARES, 2020). By improving the standards used in evaluating researchers, institutions take a step forward in the fight against predatory journals.

Finally, for information professionals and managers of "grant offices" and "scholarly communication offices" in universities, a new and challenging field of action opens up, contributing to the preservation and dissemination of good practices in academic activities and bringing a new perspective for “information literacy” actions.

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¹Such impacts are mainly evident in the evaluation processes of a researcher's scientific production when, even if inadvertently, they have publications in predatory vehicles, may have their production glossed over and, in more extreme situations, have their scientific reputation affected.

²Taking ethics as an area of study that deals with the values and conduct of man in society, notably with regard to the rules of conduct that will advocate one's rights and duties in the social context (ROSENTHAL; YUDIN, 1967), ethical conduct is seen as a result of the concept of good and correct action, based on choices and their consequences (BLACKBURN, 2020). Thus, ethical management of its editorial process by a journal presupposes a whole set of measures aimed at guaranteeing the quality and uniqueness of a given scientific content, aspects that must necessarily be considered in its editorial policy, such as: evaluation by peers, scientific reputation of the editorial board, plagiarism control, authorship statements, etc.

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