Exploration of Cardiology

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Who is the author: genuine, honorary, ghost, gold, and fake authors?

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Academic Editor: Ping Liang, Zhejiang University School of Medicine, China
Received: March 12, 2024 **Accepted:** March 15, 2024 **Published:** May 13, 2024

Cite this article: Picano E. Who is the author: genuine, honorary, ghost, gold, and fake authors? Explor Cardiol. 2024;2:88–96. https://doi.org/10.37349/ec.2024.00024

Abstract

While authorship practices can vary across different disciplines, authorship should reflect the individuals who have made a substantial contribution to the research project, take public responsibility for the paper's content, and agree to its submission for publication. In real life, the article is usually authored by at least one truly genuine author and some parasitic authors. The first author and the last author are especially important. The middle authors are less important, and their participation is often wrongly seen as an inconsequential decorative favor. The honorary author, a gift or guest author, is added as a bonus to please someone higher in the hierarchy than the submitting author. This practice is believed to enhance the chances of publication, but usually, the excess of honorary authors will make reviewers more critical. A ghost author contributed substantially but it does not appear in the list of authors to avoid declaring an overt conflict of interest. The gold author is someone paid by a third party in direct or indirect forms, and capable of writing and signing everything asked by the payer, including overstating the merits of a new drug or ignoring its drawbacks. A fake author does not exist, and while it may seem humorous it is a breach of scientific integrity and can lead to serious consequences for the individuals involved. With Chat-generative pre-trained transformer (Chat-GPT), artificial intelligence may contribute decisively to the article content and presentation. Overall, it is important to maintain high standards of integrity and transparency in authorship practices to ensure that research findings are trustworthy and reliable. The reputation of your work is in the hands of your coauthors, so choose them carefully and make sure they share your commitment to scientific integrity.

Keywords

Author, Chat-GPT, fake, honorary, gift, gold, guest

Introduction: physiologic *vs.* pathologic authorship

The choice of an author of a scientific article should be a corollary of the teamwork behind the publication and necessarily include a substantial contribution to the work. Only authors who took an active part in the

work should author the paper, and authors who did not contribute to the article should not author the paper. In honorary authorship, non-contributors are listed as authors, but this popular practice raises ethical and legal issues. Authorship may bring reputation, research money, and better jobs. To be an author is to take public responsibility for the article, and the first author and the senior author are someone capable of defending the work in a public oral or written debate. The International Convention of Medical Journal Editors is an important reference document that outlines the criteria for authorship. In its last update in 2021, it stated that an author is someone "who contributed to the study design, data acquisition, analysis, conceptualization, or manuscript writing, and therefore is entitled to take public responsibility and accountability for the paper content" [1]. This updated version represents an important improvement in comparison to the original 1993 version of the Vancouver Convention of the Journal editors, stating that mere participation in the collection of data cannot justify authorship [2]. The 1993 statement was too restrictive. It is now established that participation in data acquisition amply justifies authorship. On the same topic, the 2006 European Chart of Researchers states that employers and funders should develop strategies and practices that provide scientists, including those at the beginning of their careers, with the necessary framework conditions to recognize their actual contributions as co-authors of papers, patents, etc. [3]. This is especially important for young and non-staff researchers, in the most creative stage of their intellectual life and most vulnerable to intellectual exploitation by institutionalized plagiarism, frequently involving taking credit for the work of others in a systematic fashion [4]. In an adequate intellectual environment, the criteria for authorship are clear and transparent, honorary authorship is minimized, and institutions provide the conditions to promote recognition of researchers' contributions (Table 1).

Table 1. The genuine and the honorary author

Inclusion criteria	Genuine author	Honorary author
1. Acquisition or analysis or interpretation	v	x
2. Drafting or revising the manuscript	v	x
3. Final approval	v	x
4. Accountability and public responsibility	v	x

v: yes; x: no

Beyond these very broad borders, authorship is unacceptable and very close to the dark domain of scientific misconduct [5]. Unfortunately, simple principles are at odds with practice, and scientific authorship is governed by other non-strictly scientific criteria. In real life, the article may be authored by a truly genuine author and some additional honorary authors, such as the gift or guest author. In addition, there are some particular forms of pathologic authorship such as fake authors or gold authors (Table 2).

Table 2. The pathology of authorship

Terminology	Definition	Examples	Prevalence
Gift or guest author	Honorary author	Senior academician	Very common (> 50%)
Ghost author	Paid to not author paper	Sponsor payroll	Common (20–50%)
Gold author	Paid to author the paper	Allen's vodka man	Uncommon (5–20%)
Fake author	Does not exist	S. Bestiale	Rare (< 5%)

Any form of pathologic co-authorship can have negative consequences for the research community and individual researchers. This is a very serious problem since the quantity and quality of publications is a requisite for academic ranking, grant attraction, and public recognition. The first author and the last author are especially important, and their contributions should be substantial. The middle authors are less important, and should also have made a meaningful contribution to the research project. Unfortunately, their participation is often wrongly seen as "a right, a favor, a payback, or an inconsequential bagatelle" [6], but their inclusion can dilute the quality of the research and reduce the credibility of the authors who made significant contributions.

Authorship pathology: the honorary author

The prevalence of honorary authors is above 50%, with 3% of papers containing 3 or more honorary authors [7]. The honorary author is also known as a gift author or guest author. It is usually added to please someone higher in the hierarchy than the submitting author to increase the chances of publication, but the abundance of honorary authors will make reviewers more critical, and the chance of acceptance may decrease. Sometimes, the honorary author can be a young colleague in need of a competitive personal resume (CV), an old colleague in need of publications for the next academic contest, or someone with tight extra-scientific links with yourself or your chief. More frequently, the honorary author is the chief of the laboratory, division, or department, someone who does not know (and does not care) what you are doing but becomes very nervous if not listed among co-authors. In general, the impact of honorary authorship is limited but sometimes the paper is published in a top journal or implies a really important medical breakthrough and this may lead to significant conflicts in the assignment of scientific priority and recognition, even decades later. Harvey Feigenbaum, the father of echocardiography, describes the conflict of authorship of his first, seminal paper on echocardiography in pericardial effusion [8] with his chief, Dr. Fisch, a famous electrophysiologist in Indiana University: "Dr. Fisch was very upset with me. First, I did not put his name on that pericardial effusion paper. He didn't know anything about it. I still vividly remember going to the Xerox machine. He didn't know what I was doing. I was otherwise physically removed from him. Our offices and laboratories were in different buildings. When he saw that I was copying the paper to submit to the *Journal of American Medical Association*, it was the first time he knew I was doing anything with ultrasound. He looked at the title page and didn't see his name and he became very upset. He was of the opinion that everything that was done in his division belonged to the director. He felt that at least I should have made him aware of what I was doing. He was probably right about that. There are many people who feel the same way as Dr. Fisch. I am not going to say wrong or right, it's just different from the way I feel". His distinguished interviewer was none other than the eminent cardiologist Dr. Barry J. Maron, a trailblazer in the realm of hypertrophic cardiomyopathy, hailing from Boston. Dr. Maron expressed his lack of astonishment, remarking "I must admit that some of those authorship issues sound and feel familiar" [9]. When such occurrences transpire within the bastions of American scientific institutions, it becomes reasonable to anticipate even graver deviations elsewhere, particularly in regions with less established scientific traditions and diminished adherence to ethical norms.

Authorship pathology: the ghost author

Ghost authorship is a pathology less frequent than honorary authorship. Ghost authorship can have ethical implications as it may hide conflicts of interest and mislead readers about the true contributions to the research. A common example can clarify this aspect. A pharmaceutical company wants to test a new drug for a certain medical condition and sponsors a clinical trial. The company hires a team of researchers to conduct the study, and one of them makes a significant contribution to the design the collection and analysis of data, and the writing of the manuscript. However, the manuscript is submitted for publication and the name is not included in the list of authors. If he authors the paper, he must declare the conflict of interest and this may detract from the credibility of the paper. The damaged person is not only the ghost author who made substantial but unrecognized contributions to the study but also the reader who cannot detect the conflict of interest behind the publication. The consequences of ghost authorship are more likely to be reputational than legal. Scientific institutions and publishers may take action against individuals or organizations involved in ghost authorship, which may damage their reputation within the scientific community.

Authorship pathology: the gold author (aka, vodka man)

The concept of a "gold author" who is motivated by financial gain and willing to compromise scientific integrity is a serious concern in the scientific community. Such authors may be paid directly or indirectly by industry sponsors and may be motivated to overstate the benefits of new drugs or technologies while

downplaying potential risks or limitations. This type of behavior is considered a conflict of interest and can undermine the credibility of scientific research. Authors need to disclose any financial relationships or potential conflicts of interest when submitting articles for publication, and for journals to have strict policies in place to manage such conflicts and ensure the integrity of the peer review process. In addition, scientific societies and organizations have developed guidelines and policies to help ensure transparency and manage conflicts of interest. This includes requirements for disclosure of financial relationships, restrictions on certain types of financial arrangements, and requirements for independent review and oversight. While financial incentives are an inevitable part of the scientific enterprise, authors need to maintain integrity and prioritize the scientific process over personal gain. The credibility of scientific research depends on maintaining a high standard of ethics and transparency and avoiding any appearance of a conflict of interest. After all, there is Woody Allen within each author. The famous comedian made a successful ad for vodka and recalled it in this way: "And I am sitting home, and I'm watching television, and the phone rings and a voice on the other end says 'How would you like to be these years vodka man?', and I say 'No, I'm an artist, I do not commercials. I don't pander. I don't drink vodka and if I did, I would not drink your product.'. He said 'Too bad. It pays fifty thousand dollars.', and I said 'Hold on. I'll put Mr. Allen on the phone.'". It is enough to read the conflict-of-interest section of major guidelines of most prestigious scientific societies to realize that grants, speaker's fees, consultancies, patents, royalties, shares, and travel expenses for meetings in 5-star hotels are ubiquitous and pervasive [10].

Authorship pathology: the fake author

Some authors simply do not exist. They are named fake authors. The most famous fake authors are coworkers of distinguished physicists, one of them even the Nobel Prize for Physics in 2010. Professor Sir Andre Geim published a paper proving that powerful magnets can float living things, such as his pet hamster named Tisha, who co-authored the paper as H.A.M.S. Ter Tisha [11].

In 1987, Lawrence Livermore National Lab physicist William G. Hoover published a paper coauthored by an imaginary professor of Palermo University in a very serious journal [12]. The entire story was noticed after some years by the Italian science writer and blogger Vito Tartamella. Professor Hoover had overheard the colorful nickname from 2 young Italian women discussing the human and intellectual virtues of an Italian man they knew very well during a long airplane trip. In any case, the prestigious journal accepted the manuscript on molecular dynamics, and the imaginary Italian professor S. Bestiale has been cited hundreds of times in the subsequent literature [13].

The presence and relevance of fake authors seem on the rise [14]. If a Nobel prize practices fake authorship he is a genius with an unsurpassed sense of humor, but if you dare do it you will receive a lifetime ban from all existing journals of the world. While the use of fake authors may seem humorous to some, it is a breach of academic integrity and can lead to serious consequences for the individuals involved. The use of fake authors should be strongly discouraged and avoided at all costs, and any suspicions of such activity should be reported to appropriate authorities for investigation.

Genuine author Copernican syndrome

Authors need to maintain a level of professionalism and humility in their interactions with editors and other professionals in the scientific community. Making grandiose claims about the importance of their work can be seen as inappropriate and unprofessional [15]. Furthermore, comparing one's work to that of historical figures like Copernicus can be seen as arrogant and unrealistic. While it is important for authors to have confidence in their work, it is also important to have a realistic understanding of its significance and impact. Taken from the true life of an editor, the written reaction of the submitting author to the editor after notification of acceptance of the article was as follows: "Meanwhile, I have a suggestion. The paper I have submitted is revolutionary and historic. It is of the genre of Copernicus who disproved that the sun moves around the earth. I expect a phenomenal number of hits if this is published. You can contact the industry to use the article as an advertisement medium. You can charge a booking fee of $5,000–10,000 and

later $1 per 10 hits for the 1-year subject to a maximum liability of $100,000. This is only indicative. You can assess market factors and decide the costs. I hope you will succeed in generating good revenue from my paper. Also note that if you publish this paper, your journal will secure a place in the history of cardiology. This is the greatest idea after Doppler and this article will improve the credibility and reputation of your journal.".

As the passage notes, the author may exhibit extreme behaviors that deviate significantly from professional norms. However, even authors with more normal, physiologic profiles may exhibit abnormal behaviors during the post-acceptance period as they experience the excitement and validation of having their work accepted for publication. Authors need to maintain a professional demeanor and avoid making unrealistic or inappropriate claims about their work.

Last-minute extra-author

An author may belong to an academic family and, sometimes, only after the article has been accepted, realizes they forgot to include the academic grandfather, typically the chief of the department or something similar. The author may then panic upon realizing that publication of the paper may have detrimental and even fatal consequences for their academic career. The following message, taken from the true life of an editor, illustrates such a scenario:

"Dear Editor,

I apologize for bothering you with this question, but please let me have a chance!

This morning, my boss asked me to add another author to the manuscript, namely the Director of the Department where the angiographic examinations described in the text were performed, or at least mention him in the acknowledgments section.

Is it possible to make such a modification? If not, please disregard this message (and possibly delete it!!!)."

As corrections of authors are not possible after the article's acceptance, the paper was published without the director of the department. Honorary authorship is present in at least 1 out of 5 papers in major medical journals [16] and is probably to some extent unavoidable. However, it remains illegal to ask for honorary authorship after paper acceptance.

Great beauty of being an author

You have to be cautious in doing your work, choosing your coworkers and coauthors, and adding or refusing to add some names. You have to adapt, and some compromises are often necessary and sometimes obligatory, up to a point. Despite a large amount of editorial pollution, writing a paper is one of the ways you do your profession. According to the great pharmacologist Silvio Garattini, "For somebody in the public sector—whether in a hospital or general practice—participation in a research project should be the rule. Ideally, every act of a physician should be part of a research project" [17]. Writing the paper is the final and most important step of completing a research project. One should never miss the point of the great social impact of our work, and the great beauty of sharing your experience and findings with the whole community. Writing a paper is not only a professional obligation but also an opportunity to share knowledge, experience, and findings with the scientific community and contribute to the advancement of medicine and health.

A new kid in town: the artificial intelligence-author

Since its introduction in November 2022, the artificial intelligence (AI) Chat-generative pre-trained transformer (Chat-GPT) has revolutionized scientific communication. Its open-access, free informatics platform, and its staggering capability to understand and generate natural language text, also with a multi-language platform, has made it a game-changer in the field. In just a few weeks, Chat-GPT has transformed

the way we write, not only in the scientific literature. It is a valuable tool for language editing, grammar-checking, correction, and harmonization, but it is capable of much more. It presents information in an organized and elegant manner and it can address both simple and more complex questions in a semi-original, up-to-date, and well-documented way. As a result, it was even credited as a coauthor with a formal debut in scientific literature a few weeks after its launch [18]. On the flip side, Chat-GPT can generate from fake data scientific abstracts and papers very difficult to distinguish from a human-written manuscript with genuine data [19]. The leading science journal *Nature* established ground rules for the use of Chat-GPT in the preparation of scientific papers [20]. First, Chat-GPT (or a similar tool) will not be accepted as a credited author on a research paper. That is because any attribution of authorship implies accountability for the work, and AI tools cannot take such responsibility. Second, researchers using tools should document this use in the methods or acknowledgments sections. If a paper does not include these sections, the introduction or another appropriate section can be used to document the use of the tool. In the present paper, Chat-GPT was used to rephrase all sections of the manuscript, with detectable benefits for the clarity of presentation and correctness of syntax.

Road to publication

Writing and publishing a paper is indeed a long and challenging process. As an author, it is important to have self-confidence and believe in the value of your work, but also to remain humble and open to constructive criticism (Table 3).

Table 3. The good *vs.* the bad author

Features	Good author	Bad author
Key psychological trait	Perseverance	Narcisism
Criticisms of your work	A gift	A personal offense
Attitude *vs.* reviewers	Best friend of manuscript	Deadly enemy of the author
Revision strategy	Obeys like a little soldier	Objects and barks
Reaction after rejection	Reviewer understood too well	Reviewer did not understand
Paper after revision	Much improved	Resubmitted as it was

Perseverance is also crucial in the journey of writing a paper. There will be obstacles and setbacks, but staying focused and determined to see the project through to the end is important. It may require extra work and sacrifice, but the result is worth it (Figure 1).

It is important to note that writing a paper solely for the purpose of career advancement or to pad your CV is not ethical. Honorary, gift, guest, or ghost authorship should be avoided at all costs. These practices undermine the integrity of the scientific community and the value of the research being conducted. A paper written with perseverance, confidence, and humility is truly worth writing and can have a lasting impact on the scientific community.

Conclusions

In biomedicine, a strict application of the genuine authorship criteria might lead to the sudden academic death or premature academic aging of the young and laborious first genuine author. However, an abnormal increase in honorary (gift or guest) and gold authorship is a specific hallmark of intellectually polluted environments. It is important to remember that while the act of publishing a paper is not a guarantee of its scientific merit, it is still an important aspect of scientific progress [21]. There are many factors determining if and where your work is published, including the editorial standards of the journal, the quality of the reviewers, and the current trends in the field. Nevertheless, a scientific work without publication is a spectacle in front of empty seats. Persistence and perseverance are important qualities for any writer or creator. If you believe in your work and are willing to put a significant effort to refine and improve it through the revision process, you may eventually find the right journal. During this process, you must be

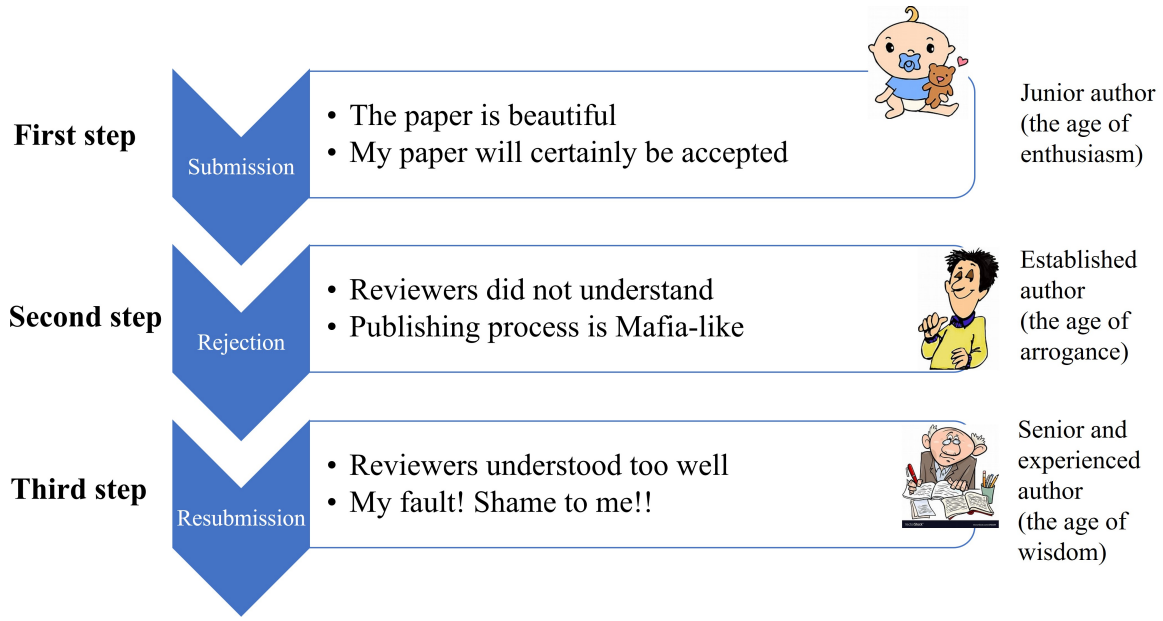

Figure 1. The 3 ages of a submitting author: pediatric (first row), adolescent (second row), adult (last row)

open to feedback and constructive criticisms, which can help you improve your skills and refine your message. Publication allows for the sharing of knowledge and dissemination of the findings, which can lead to advancement in the field. Ultimately, the goal of scientific research and publishing should be to advance knowledge and improve the world, rather than simply to rack up publications or gain personal accolades.

To do

In essence, proficient authors recognize that composing and disseminating a paper represents a crucial avenue for sharing accumulated expertise. They adhere strictly to principles of accuracy and reliability, ensuring that only pertinent and dependable data is incorporated. Authorship is reserved for those individuals who have significantly contributed to advancing the research, while those with potential conflicts of interest are appropriately excluded. The selection of coauthors is conducted judiciously, ensuring alignment with the overarching commitment to scientific integrity:

(1) Writing and publishing a paper is an important way to share your experience.

(2) Trust in what you write and only include data that is accurate and reliable.

(3) Involve only authors who have genuinely contributed to improving the research.

(4) Avoid including authors who may have a conflict of interest.

(5) Choose your coauthors carefully and make sure they share your commitment to scientific integrity.

Not to do

Conversely, an inept author is characterized by minimal involvement in the paper's development, a lack of trust in its content, and inclusion solely to bolster acceptance prospects or due to external pressures. Adhering strictly to these fundamental authorship guidelines, dictated by ethical imperatives and logical reasoning, is essential. Failure to do so can engender significant professional repercussions at various stages of one's career trajectory:

(1) Author a paper you do not work in.

(2) Author a paper you do not trust.

(3) Author or write a paper only to expand your CV.

(4) Add an author only because you trust your chances of acceptance will rise.

(5) Add an author only because your chief asked you to do it.

Abbreviations

Chat-GPT: Chat-generative pre-trained transformer

CV: personal resume

Declarations

Author contributions

EP: Conceptualization, Writing—original draft, Writing—review & editing.

Conflicts of interest

Eugenio Picano who is the Editor-in-Chief of *Exploration of Cardiology* had no involvement in the decision-making or the review process of this manuscript.

Ethical approval

Not applicable.

Consent to participate

Not applicable.

Consent to publication

Not applicable.

Availability of data and materials

Not applicable.

Funding

Not applicable.

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