ACKNOWLEDGMENTS THROUGH THE PRISM OF THE ICMJE AND CHATGPT

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Jaime A. Teixeira da Silva¹* https://orcid.org/0000-0003-3299-2772
Panagiotis Tsigaris² https://orcid.org/0000-0002-7965-4554
¹Independent researcher, Miki-cho, Japan
²Department of Economics, Thompson Rivers University, Kamloops, British Columbia, Canada

*Corresponding author:
Jaime A. Teixeira da Silva, Independent researcher, Ikenobe 3011-2, Kagawa-ken 761-0799, Japan
E-mail: jaimetex@yahoo.com

Abstract
The International Committee of Medical Journal Editors (ICMJE) guidelines are widely employed as an set of ethical standards for biomedical journals, and thus for biomedical researchers. In this paper, we revisit the topic of acknowledgements in academic papers, noting that the former serve as a lesser form of recognition relative to authorship. We note the possible existence of bias, such as a power imbalance due to a status imbalance, as well as the risk of “ghost” acknowledgements. To further ground our ideas, we turned to ChatGPT-4 for input, noting some curious and informative supplementary findings. Curiously, ChatGPT-4 offered a set of recommendations and guidance, comparable to those of the ICMJE.

Keywords: Accountability, Bias, Ethics, Conflicts of interest, Editorial responsibility, Peer review, Post-publication peer review, Quality control, Transparency

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In academic papers that are published in peer-reviewed journals, the acknowledgement section allows authors to acknowledge individuals, organizations or others who offered some assistance or contribution to the paper, but not sufficiently to merit authorship [1]. In the biomedical sciences, this section of an academic paper usually follows recommendations by the International Committee of Medical Journal Editors (ICMJE), serving as a set of ethical guidelines for authors [2]. The ICMJE defines for whom acknowledgements are applicable, also noting that explicit permission is required from the individual or entity that is acknowledged (details in Suppl. Table 1). The ICMJE recommendations apply to authors, but there may be nuances in how they apply to artificial intelligence (AI)-driven large language models, such as ChatGPT [3].

Some literature has argued that AI tools should not be banned, because bans are not enforceable. Furthermore, such tools cannot be co-authors nor acknowledged as they cannot be accountable or responsible for the content they produce in response to a human query [4, 5]. Furthermore, as was stated above, the ICMJE recommends that authors obtain explicit permission from the person being acknowledged [2], which is not possible with an AI tool. For transparency and consistency, as with the use of other tools (e.g., computing software), AI usage should be disclosed in the methods section of a paper and in the body of the text where the tool is cited [4, 5]. In addition, if peer reviewers used AI to create referee reports, they need to disclose it to the editors [4]. WAME’s new recommendation supports the above disclosures, but the organization goes further and
recommends disclosure also of the prompts that were used, including the time and date of the queries [6].

The acknowledgment section of academic papers may be biased in that recognition might only be given to those that increase the chances of that paper's publication and not to those that truly deserve recognition, with two possible causes: a power imbalance due to a status imbalance (e.g., professor vs. student), and/or the lack of verification tools by journal editors. Given the strong evidence that indicates the existence of ghost co-authors [7], there are almost certainly acknowledgements in published papers that do not recognize ghosts' contributions to the research. We coin a new term for this phenomenon: "ghost acknowledgements".

As part of our ongoing interest in the role that ChatGPT is playing in academia, especially its ability to offer information and advice on a wide range of issues related to scientific editing [8], but also cognizant of its limitations [9], including the potential for abuse by non-academic actors such as predatory entities or "paper mills" [10], we asked ChatGPT-4 two queries regarding who should or should not be acknowledged in an academic paper (queries 1, 2: Appendix). Relative to the ICMJE, ChatGPT-4 seemed to provide a better structure (set of six categories) and comprehensive set of examples regarding those who should be acknowledged.

ChatGPT-4 stated (last sentence of query 1 and clause 1 of query 2): “Anyone who contributed substantially to the research or the writing of the paper” (emphasis ours), which appears to directly contradict the ICMJE recommendations, which state that writing only cannot qualify one to be a co-author. In addition, one of the suggestions regarding who should not be acknowledged is unclear (query 2: Appendix). ChatGPT-4 claims that paid consultants should not be acknowledged if they were compensated for their contributions. However, if their contribution is related to any aspect of the research or writing, they should be acknowledged [11]. ChatGPT-4 agreed with this assumption in a follow-up query, but also raised the potential issue of conflicts of interest with payments made out to organizations and individuals (query 3: Appendix). ChatGPT-4 provided no specific source for its advice (query 4: Appendix). ChatGPT-4 also recognized the existence of recognition biases in the acknowledgements section (query 5: Appendix).

Researchers in Central Asia, like other researchers around the world, may very well be tempted to rely on AI, like ChatGPT-4, either to assist with editing or translation into English. Although the use of such AI is not unethical, authors are requested by journals that subscribe to ICMJE recommendations and other popular ethics guidelines to clearly acknowledge its use in their papers. Although it may be tempting to skip an acknowledgement to AI or ChatGPT, in the belief that the weaknesses of current AI-text detectors [12] will not allow their hidden use to be detected, in the future, such undeclared use might be detected, and carry with it ethical penalties.

With suitable guidance and human supervision, would ChatGPT-4 be able to provide a better system of guidance and recommendations than the ICMJE, i.e., is it possible that the role of the ICMJE becomes redundant in the light of ChatGPT's capabilities? Only time will tell.

CONFLICTS OF INTEREST
The authors declare no conflicts of interest of relevance to this topic.

AUTHORS' CONTRIBUTIONS
The authors, who are co-corresponding authors, contributed equally to the intellectual discussion underlying this paper, literature exploration, writing, reviews and editing. ChatGPT-4, which was sourced via the second author's account, was used for the queries.

References


Table 1. ICMJE statements pertaining to Acknowledgments or to the Acknowledgments section of an academic paper

<table>
<thead>
<tr>
<th>Statement</th>
<th>Page</th>
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<tbody>
<tr>
<td>“Those who do not meet all four criteria[^2] should be acknowledged—see Section II. A.3 below.”</td>
<td>2</td>
</tr>
<tr>
<td>“Contributors who meet fewer than all 4 of the above criteria for authorship should not be listed as authors, but they should be acknowledged. Examples of activities that alone (without other contributions) do not qualify a contributor for authorship are acquisition of funding; general supervision of a research group or general administrative support; and writing assistance, technical editing, language editing, and proofreading. Those whose contributions do not justify authorship may be acknowledged individually or together as a group under a single heading (e.g., “Clinical Investigators” or “Participating Investigators”), and their contributions should be specified (e.g., “served as scientific advisors,” “critically reviewed the study proposal,” “collected data,” “provided and cared for study patients,” “participated in writing or technical editing of the manuscript”).”</td>
<td>3</td>
</tr>
<tr>
<td>“Because acknowledgment may imply endorsement by acknowledged individuals of a study’s data and conclusions, editors are advised to require that the corresponding author obtain written permission to be acknowledged from all acknowledged individuals.”</td>
<td>3</td>
</tr>
<tr>
<td>“Journals should notify reviewers of the ultimate decision to accept or reject a paper, and should acknowledge the contribution of peer reviewers to their journal.”</td>
<td>5</td>
</tr>
<tr>
<td>“If you use data from another published or unpublished source, obtain permission and acknowledge that source fully.” “If a figure has been published previously, acknowledge the original source and submit written permission from the copyright holder to reproduce it.”</td>
<td>18</td>
</tr>
<tr>
<td>“The manuscript must be accompanied by permission to reproduce previously published material, use previously published illustrations, report information about identifiable persons, or to acknowledge people for their contributions.”</td>
<td>19</td>
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</table>

[^1]: According to ICMJE (https://www.icmje.org/icmje-recommendations.pdf). We note also that the clauses have not changed relative to previous versions of the ICMJE recommendations, published in 2019-2023 (the wording of versions prior to 2019 were not verified).

[^2]: Referring to ICMJE’s four clauses that it suggests would meet authorship
Who should be listed in the acknowledgements section of an academic paper?

The acknowledgments section of an academic paper provides an opportunity to thank individuals or institutions who contributed to the research but did not qualify for authorship. The following individuals or groups can be mentioned in the acknowledgments section of an academic paper:

1. Funding sources or grants: Researchers can acknowledge the funding agencies or organizations that provided financial support for the research.
2. Colleagues and mentors: Researchers can thank colleagues and mentors who provided valuable input, feedback, or support throughout the research process.
3. Study participants: Researchers can thank the participants who volunteered their time and efforts to take part in the study.
4. Technical or administrative support: Researchers can thank the technical or administrative staff who provided assistance with data collection, analysis, or other technical aspects of the research.
5. Family and friends: Researchers can acknowledge the emotional support and encouragement provided by family and friends during the research process.
6. Editors or reviewers: Researchers can thank the editors or reviewers who provided constructive criticism and feedback to improve the quality of the paper.

It is important to note that the acknowledgments section should be used to acknowledge individuals or groups who contributed to the research but do not meet the criteria for authorship. Anyone who contributed substantially to the research or the writing of the paper should be considered for authorship and listed as a co-author.
Query 2 to ChatGPT-4: “Who should not be listed in the acknowledgement section of an academic paper?”
Date of query: 15 April 2023

Who should not be listed in the acknowledgements section of an academic paper?

The acknowledgements section of an academic paper is not intended to provide credit to individuals who have not made a significant contribution to the research or the writing of the paper. Therefore, the following individuals or groups should generally not be listed in the acknowledgements section:

1. Individuals who do not meet the criteria for authorship: Anyone who contributed significantly to the research or the writing of the paper should be considered for authorship and listed as a co-author.
2. Individuals who provided routine or minor assistance: Individuals who provided routine or minor assistance, such as providing equipment or general advice, may not warrant acknowledgment in the paper.
3. Individuals who provided personal or emotional support only: While emotional support is valuable, it is not a contribution that warrants acknowledgement in an academic paper.
4. Individuals who were compensated for their contributions: Individuals who were compensated for their contributions, such as paid consultants or contractors, may not require acknowledgment in the paper, as their contributions were part of a professional arrangement.
5. Individuals who did not provide any direct contributions to the research: Individuals who did not provide any direct contributions to the research or the writing of the paper should not be acknowledged.

It is important to note that the guidelines for acknowledging contributions in an academic paper can vary by discipline and publishing venue. Therefore, it is recommended to review the guidelines of the specific journal or conference where the paper will be submitted to ensure that the acknowledgements section follows their guidelines.
What is the reason individuals who were compensated for their contributions, such as paid consultants or contractors, may not require acknowledgment in the paper?

Individuals who were compensated for their contributions, such as paid consultants or contractors, may not require acknowledgment in the paper because their contributions were part of a professional arrangement. In other words, they were compensated for their work and were not providing assistance as a favor or for free. As such, their contributions can be considered as part of their professional responsibilities or job duties, and acknowledging them in the paper may not be necessary.

Furthermore, acknowledging compensated contributors in the acknowledgements section of an academic paper may raise questions about conflicts of interest, especially if the contributions were significant. Acknowledging compensated contributors in the paper could imply that their contributions are being given more weight than other contributions that were not acknowledged, which could create the perception of bias.

However, if the compensated contributors made a significant contribution to the research that goes beyond their professional responsibilities, they may still be acknowledged in the paper. In such cases, it is important to ensure that the acknowledgment is appropriate and does not create a conflict of interest.
Query 4 to ChatGPT-4: “What were some sources you used to arrive to the conclusion not to list, in the acknowledgement section, individuals who were compensated for their contribution?”
Date of query: 17 April 2023

What were some sources you used to arrive to the conclusion not to list, in the acknowledgement section, individuals who were compensated for their contribution?

As an AI language model, I don’t have a specific source for this information, but this is a commonly accepted practice in academic writing. It is generally understood that individuals who were compensated for their contributions, such as paid consultants or contractors, may not require acknowledgment in the paper because their contributions were part of a professional arrangement.

This practice is supported by several publishing organizations and academic institutions. For example, the International Committee of Medical Journal Editors (ICMJE) provides guidelines for authorship and contributorship in biomedical publications. According to these guidelines, "authorship credit should be based only on substantial contributions to (a) conception and design, or analysis and interpretation of data; and to (b) drafting the article or revising it critically for important intellectual content; and on (c) final approval of the version to be published." It is not mentioned that individuals who were compensated should be acknowledged.

Similarly, many academic institutions have guidelines for research ethics and the responsible conduct of research, which may include guidelines for acknowledgments. These guidelines typically emphasize the importance of acknowledging only those who have made significant contributions to the research, regardless of their compensation status.

Overall, the decision not to acknowledge individuals who were compensated for their contributions in the acknowledgments section of an academic paper is based on commonly accepted practices and guidelines for academic writing, as well as ethical considerations surrounding conflicts of interest.
Query 5 to ChatGPT-4: “Are there recognition biases in the acknowledgement section of peer reviewed papers?”
Date of query: 19 April 2023

Yes, there is a potential for recognition biases in the acknowledgement section of peer-reviewed papers. Recognition bias can occur when authors acknowledge certain individuals or groups based on personal or professional relationships rather than their actual contributions to the research.

For example, authors may be more likely to acknowledge colleagues or researchers from prestigious institutions, regardless of the extent of their actual contributions to the research. Conversely, authors may fail to acknowledge individuals who made significant contributions to the research but do not have the same level of recognition or status in the field.

Recognition bias can also occur if authors fail to acknowledge individuals from underrepresented groups or if they acknowledge only those who conform to certain societal or cultural norms. This can perpetuate inequalities and limit opportunities for individuals who are not part of the dominant group in the field.

To minimize the potential for recognition bias in the acknowledgement section, it is important for authors to be aware of their own biases and to acknowledge all individuals who made significant contributions to the research, regardless of their status or background. Authors may also choose to consult with co-authors, colleagues, or mentors to ensure that they are acknowledging all relevant contributors in a fair and transparent manner.
Рекомендации Международного комитета редакторов медицинских журналов (ICMJE) широко используются в качестве набора этических стандартов для биомедицинских журналов и, следовательно, для биомедицинских исследователей. В этой статье мы возвращаемся к теме благодарностей в научных статьях, отмечая, что первые служат меньшей формой признания по сравнению с авторством. Мы отмечаем возможное существование предвзятости, такой как дисбаланс сил из-за статусного дисбаланса, а также риск «призрачных» признаний. Для дальнейшего обоснования наших идей мы обратились за информацией к ChatGPT-4, отметив некоторые любопытные и информативные дополнительные выводы. Любопытно, что ChatGPT-4 предложил набор рекомендаций и указаний, сравнимый с рекомендациями ICMJE.

**Ключевые слова:** подотчетность, предвзятость, этика, конфликт интересов, редакционная ответственность, экспертная оценка, рецензирование после публикации, контроль качества, прозрачность.

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