The positivity trap: is a bias against null results in research literature holding back science?

Samuel Winthrop

Executive Publisher, Discover Journals

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What are null results and why are they worth talking about?

Null results in research: essential for science

Null results, which in this context includes negative or inconclusive results, are outcomes that do not confirm the hypothesis of a research project

Arriving at null results is a natural part of research, and sharing such findings can:

- **Inform** other researchers that the original line of research did not support the hypothesis
- **Prevent the duplication** of unnecessary research, saving time and funding
- **Inspire** new hypotheses or methodologies in relation to the research topic
- Increase **transparency** and **reproducibility** in research
- **Accelerate** the advancement of scientific discoveries

Null results in research: essential for science

Not sharing null and inconclusive results contributes to research waste. A study prepared for the European Commission estimated in 2018 that up to **€26 billion in Europe alone has been wasted** due to duplicated work stemming from a lack of awareness, or access to, existing research data or null results.[1]

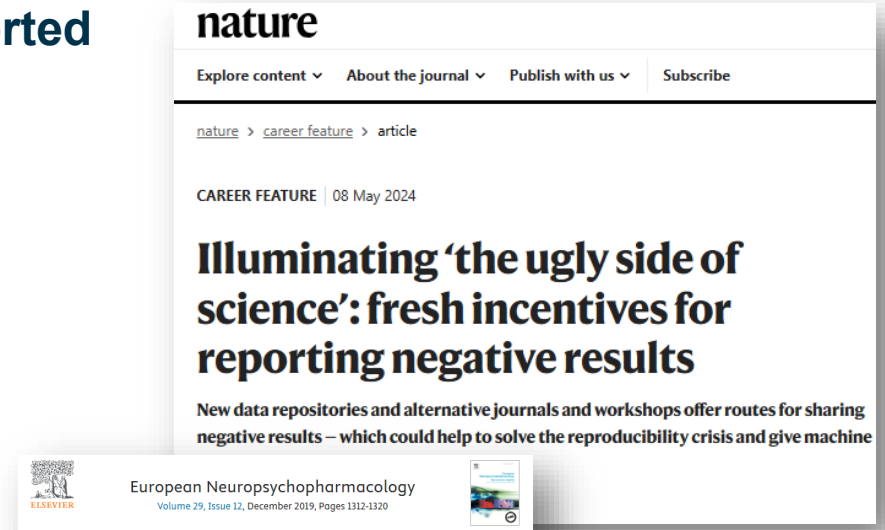
Other studies have shown that the National Institutes of Health is costing US taxpayers over **$100 million per year due to research waste** through unreported trials.[2,3]

1. European Commission. (2018). Cost of not having FAIR research data: Cost-benefit analysis for FAIR research data (p. 26). https://doi.org/10.2777/02999
2. Bruckner, T. (2023). NIH waste far over $100 million in medical research funding every year – new study. https://www.transparimed.org/single-post/nih-research-waste.
3. Rees, C. A., Narang, C., Westbrook, A., & Bourgeois, F. T. (2023). Dissemination of the results of pediatric clinical trials funded by the US National Institutes of Health. JAMA, 329(7), 590–592. https://doi.org/10.1001/jama.2022.24025

Null results in research: under-reported

Yet despite the importance of them, the publishing of null results as peer-reviewed research papers is in decline, with researchers often opting to share such work informally at conferences or directly with peers.

Limited studies have been made on this topic, identifying barriers such as traditional research assessment's focus on citations, which put null results at a disadvantage.[4,5]



4. Nature (May 2024). Illuminating 'the ugly side of science': fresh incentives for reporting negative results. https://doi.org/10.1038/d41586-024-01389-7
5. Be positive about negatives–recommendations for the publication of negative (or null) results, European Neuropsychopharmacology https://doi.org/10.1016/j.euroneuro.2019.10.007.

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The State of Null Results

Null results: the researcher perspectives

To have a better understanding of researchers' experiences with null results, in 2024 Springer Nature initiated one of the largest surveys of its kind, asking over 11,000 researchers their perspectives on the sharing of null results.

The result was the white paper, *The State of Null Results*[6].

6. Springer Nature (2025, July). *The state of null results: Insights from 11,000 researchers on negative or inconclusive results.* https://stories.springernature.com/the-state-of-null-results-white-paper/index.html

Null results: the researcher perspectives

From the survey results, we could report that null results are an important part of the research ecosystem:

- **Over half (53%) of researchers have generated null results, and an overwhelming majority (98%) recognise their value.**

- The top three benefits experienced by those who have published null results in a journal included:

  - **Inspiring a new hypothesis or methodology in relation to the research topic (39%)**
  - **Helping identify issues with the methodology (29%)**
  - **Preventing the duplication of unnecessary research (28%)**

Null results: the researcher perspectives

Yet, as we had hypothesised, a gap remains in translating this to the scientific record:

- **85% of surveyed researchers believe that sharing null results is important**
- **But only 68% of those who have generated null results have shared them in some form**
- **And less than a third (30%) have submitted these to a journal**

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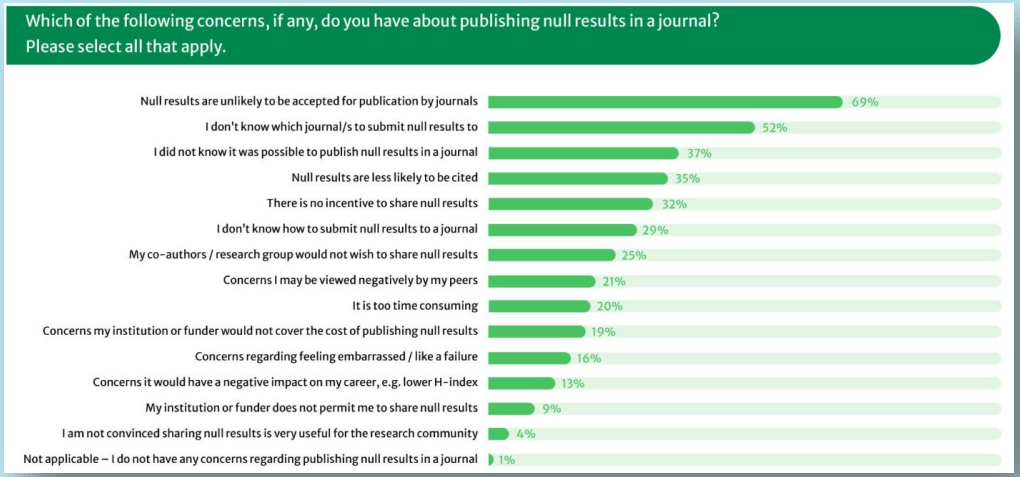
Why are null results under-reported in published literature?

Null results: the researcher perspectives



What were the barriers to publishing null results?

Researchers listed several challenges to publishing null results, including:

- concerns about negative bias leading to reputational harm
- a lack of clarity on where to publish
- a low likelihood of journal acceptance
- lack of support.

Only 15% are aware of journals that actively encourage null result submissions

More than half (55%) of researchers surveyed were unaware of institutional or funder support to share null results.

Null results: the barriers

Bias and reputation risk

Researchers reported negative connotations to terms such as 'negative results' (which was one of the two top-reported terms used, alongside 'inconclusive results').

> *"I will not say these are negative results. If we did our experiments properly without any mistakes then [the] data that we get still describe a new result."*
>
> **– Malaysia, Medicine, PhD or Master's Student in a University/College**

Researchers also felt that publishing null results could have a negative impact on their career or reputation.

These concerns align with previous findings[7] on the reliance on quantitative metrics, such as citations and Journal Impact Factors, which do not incentivise the publication of null results.

7. Springer Nature. (2025). The state of research assessment: Researcher perspectives on evaluation practices. https://stories.springernature.com/state-of-research-assessment

Null results: the barriers

Lack of clarity on how and where to publish null results

For those who have generated null results and think that sharing them is important, but who did not share or try to share them, the second biggest concern is not knowing which journal to submit null results to (52%). Additionally, 29% also responded that they do not know how to submit null results to a journal.

Across all survey respondents, only 15% of researchers were aware of a journal that encourages publication of null results.

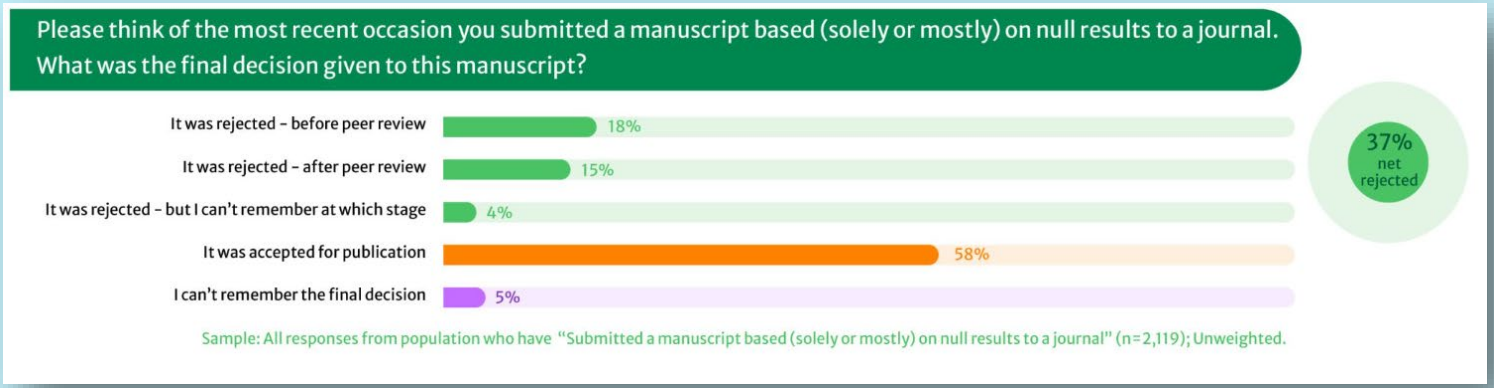
This is where there can be clear recommendations for publishers, to ensure journal policies are clear where journals welcome work reporting inconclusive or null results. In addition there is work to be done on raising awareness of article types such as registered reports, which can aid in the unbiased reporting of inconclusive data.

Null results: the barriers

A perceived low likelihood of journal acceptance

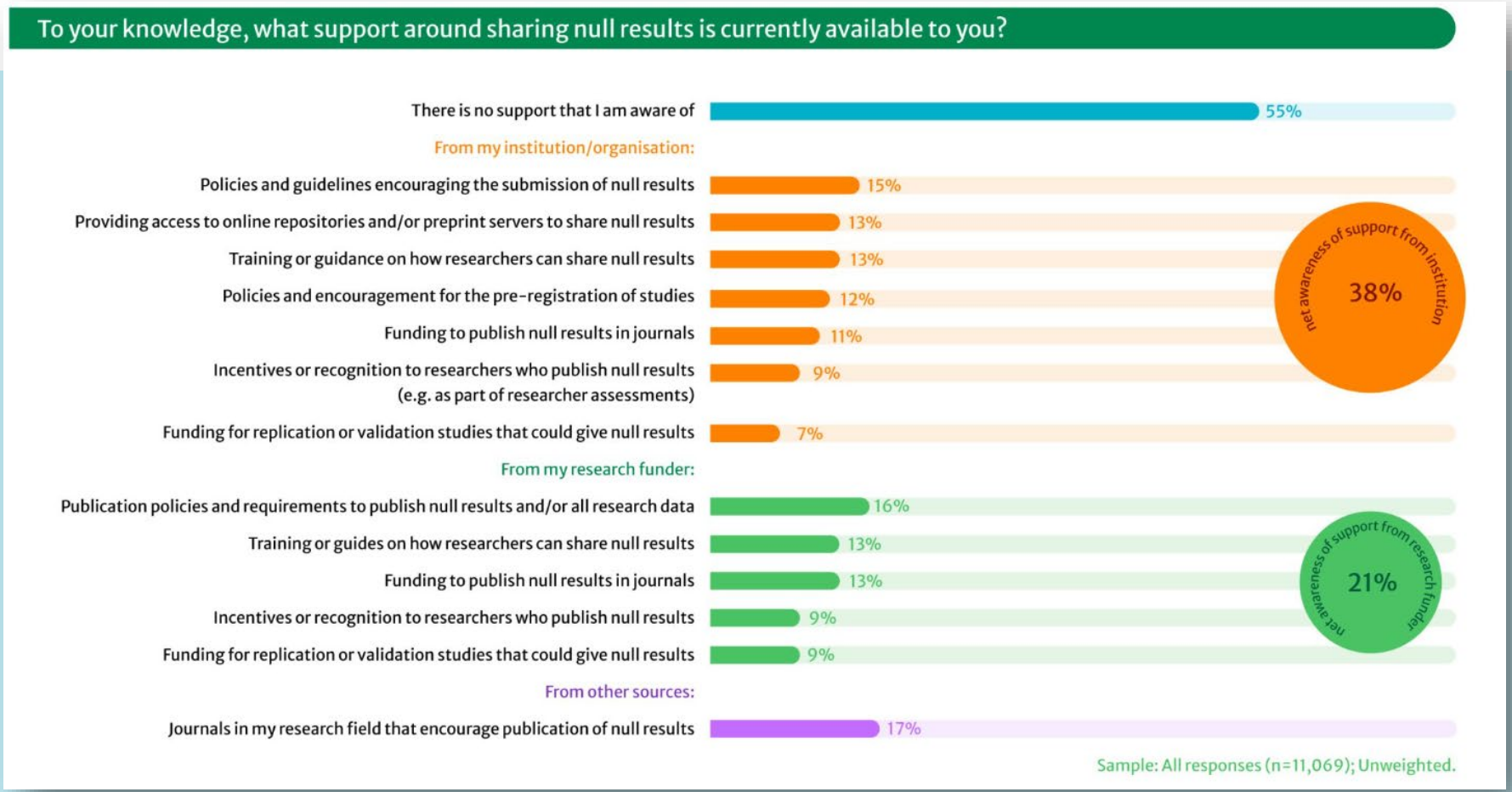
Most researchers felt that null results would mean a paper was less likely to be accepted at a journal (82%). This was also listed as the number one concern around sharing null research by 69% of the researchers who had generated such work, agreed they were important and had not tried to share them.

Of those who had submitted a manuscript based solely or mostly on null results, 58% reported that it was accepted, 37% reported it was rejected, and 5% could not remember. Most (93%) felt the null results played a part in the decision



The perception of low acceptance rates leads to a scepticism towards investing time into papers based on null results, with concerns around them being too time consuming to outweigh the disadvantages of writing a paper based on null results.

Null results: the barriers



Null results: where do we go from here?

Based on these finding, what are our next steps?

More data: we should continue to study this aspect of the publishing ecosystem, so as to further our understanding of a complex issue, and to learn more about the attitudes of researchers and other elements of the academic and publishing community.

We can, however, already draw some idea for what we need to do collectively to face these challenges:

- **Increase visibility and support: Journals, institutions, and funders should clearly communicate policies and provide resources for publishing null results**
- **Promote cultural change: Educational campaigns and success stories can normalise the sharing of null results, reduce stigma, and showcase the benefits of publishing**
- **Reform research assessment: Broaden evaluation criteria so that all rigorous research, regardless of outcome, is recognised in research assessment**

THANK YOU

Samuel Winthrop
Executive Publisher, Discover Journals
samuel.winthrop@springernature.com

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