American Association for Cancer Research
FINDING CURES TOGETHER

# Quantifying and Assessing the Use of Generative AI by Authors and Reviewers in the Cancer Research Field

Daniel S. Evanko, PhD and Michael Di Natale
American Association for Cancer Research

**Tenth International Congress on Peer Review and Scientific Publication**
**Chicago, IL**
**Sept 3-5, 2025**

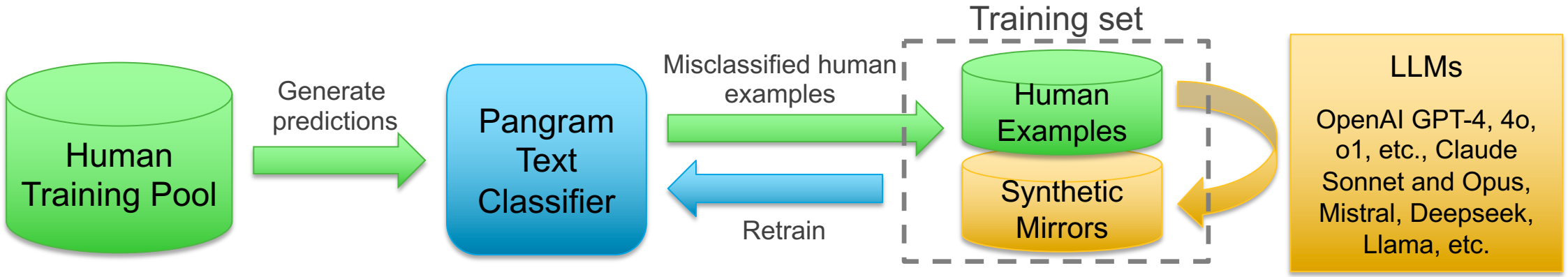
No conflicts of interest or funding to disclose

© American Association for Cancer Research

# Detecting the Use of Generative AI (GenAI)



- Most existing AI-detection methods have false-positive rates that make their use by publishers for assessing manuscripts or peer reviewer comments problematic.
- Starting with a human training pool, the Pangram text classifier (doi:10.48550/arXiv.2402.14873) fine-tunes a language model on the classification task of fully AI-generated vs. fully human-written across many domains and from many different LLMs and refines the model using synthetic mirrors and Low-Rank Adaptation (LoRA) to achieve a very low false-positive detection rate.




**Synthetic Mirror Example**

[Prompt] Write a Wikipedia article about <topic>. Start with these sentences: <excerpt>. Make the article about <original article length> long.

# Study Design



- Examined 46,500 original research manuscripts and associated reviewer comments submitted to 10 AACR journals from 2021 through 2024.
- Analyzed the abstract and methods text of each submission because this text is stored in the submission system as plain text and easily extracted.
  - Hypothesized that authors would be the most likely to use GenAI on the abstract text and least likely to use it on the methods text.
  - We had previously observed that the methods section can be prone to generating false-positive detections of GenAI usage.
- Analyzed the first-round reviewer comments to the authors.

**2021 to 2024**

**46,500**
Original Research Articles

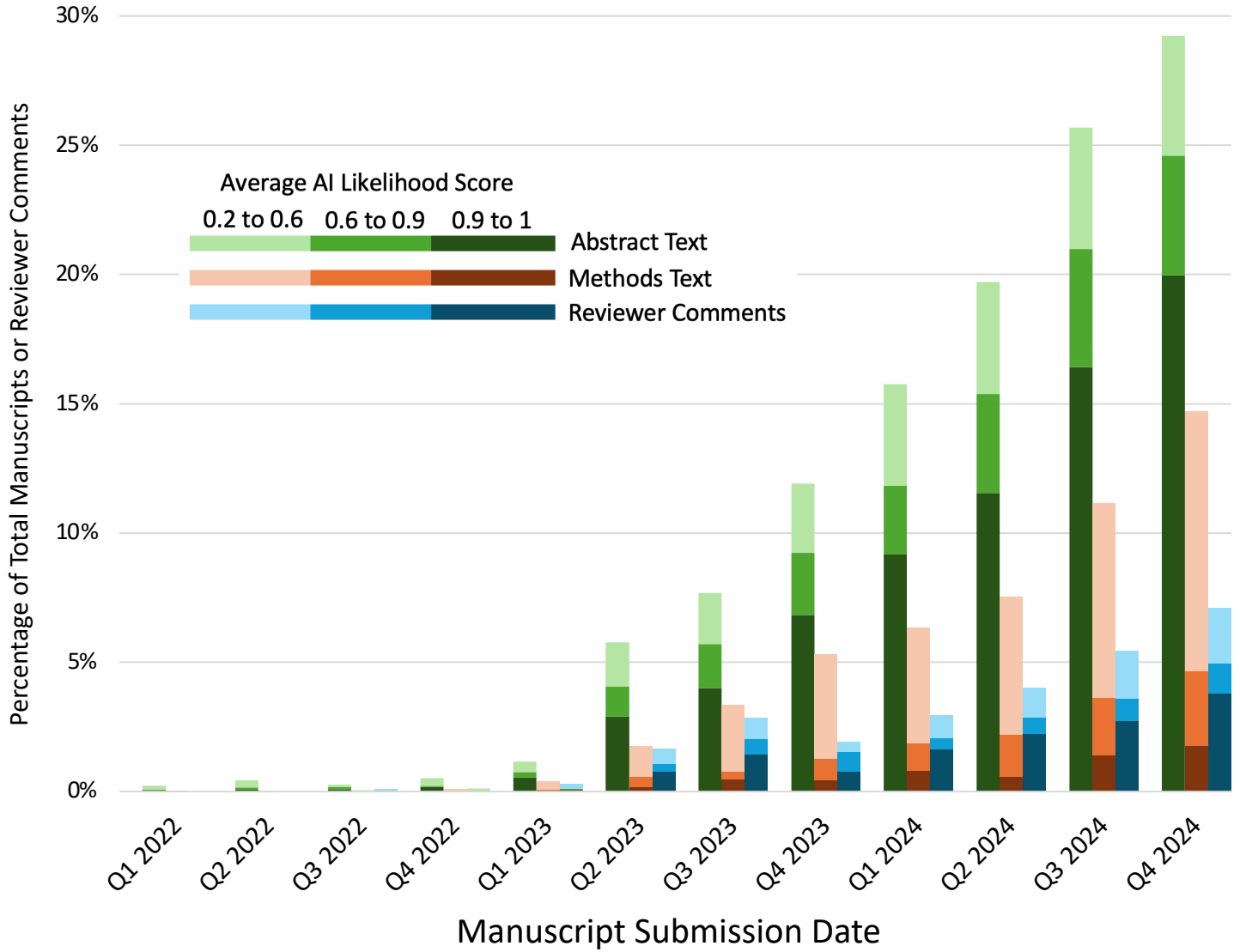
**46,500**
Abstracts

**46,021**
Methods Sections

**29,544**
Reviewer Comments

# Manuscript Text and Reviewer Comments Containing AI-generated Text

American Association for Cancer Research®
FINDING CURES TOGETHER®




Data from 2021 to 2022 showed the following false-positive rates:

Abstract Text: **0.22%**, 40/18467
Methods Text: **0.07%**, 13/18303
Reviewer Comments: **0.03%**, 4/12908

There was a nearly linear increase in detections following the launch of ChatGPT in November 2022.

The exception was a >50% drop in reviewer comment detections in Q4 2023 after the AACR journals implemented a policy prohibiting use of GenAI for peer review.

# Further Analyses

American Association for Cancer Research®
FINDING CURES TOGETHER®

## Using our initial 2021 to 2024 submission data we:

- Examined all original research manuscripts submitted in 2024 (8318 abstracts, 8260 methods sections, and 1395 reviewer comments) and looked at the following manuscript characteristics for their association with the use of GenAI on submitted manuscripts.

English as a native language | Identity of the journal | Decision to send for peer review

## Using new 2025 submission data we:

- Compared required author disclosures of their use of AI to what we detected ourselves.
- Conducted a small case study showing the use of GenAI detection and characterization to identify fraudulent submissions.

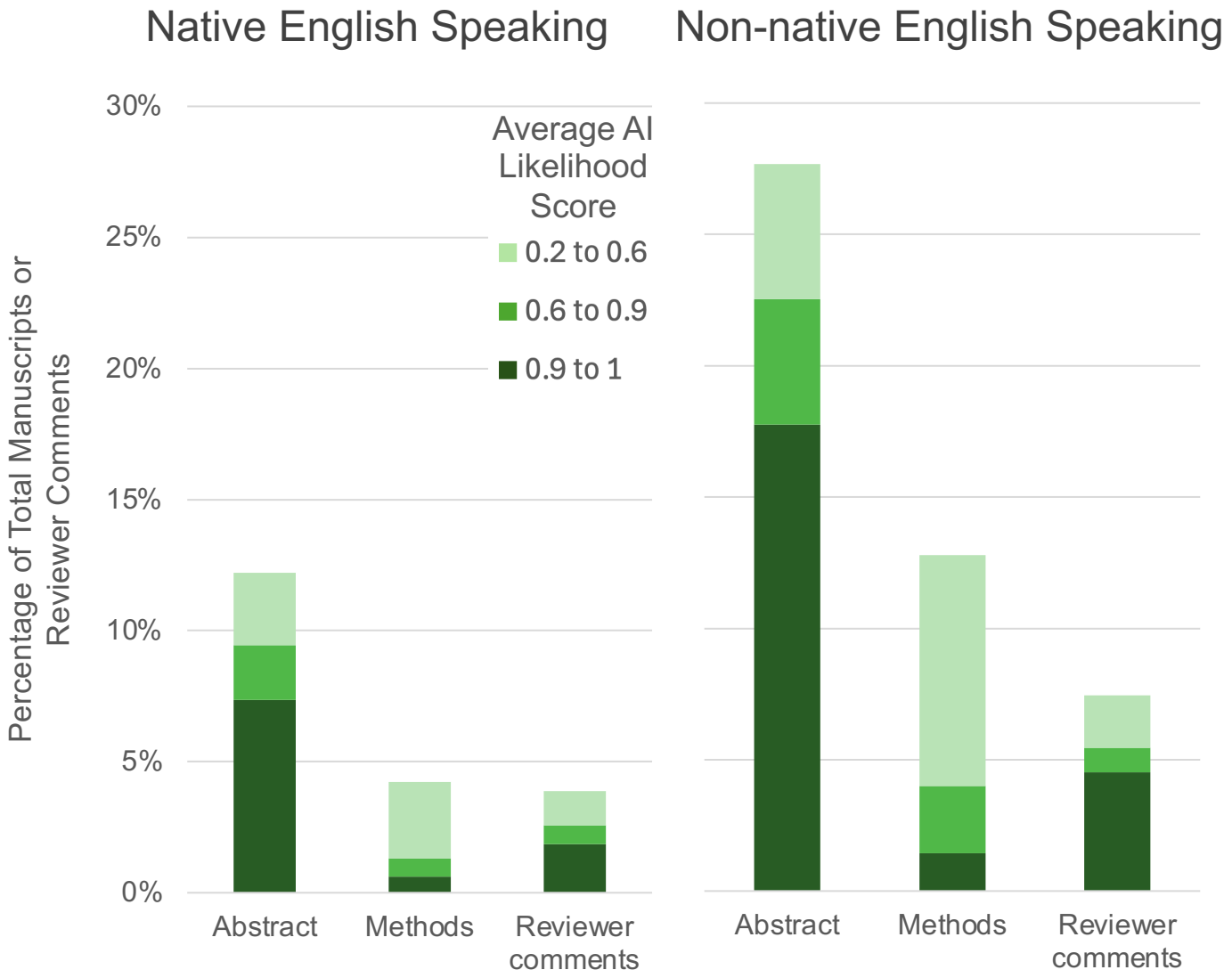
# Association of Authorship English Status with use of GenAI (native vs non-native English speaking)

American Association for Cancer Research®
FINDING CURES TOGETHER®

- Each manuscript or reviewer comment was assigned as either native or non-native English speaking based on whether an official language of the corresponding author (or reviewer) institution's country is English.

Fold difference for non-native English speaking vs native English speaking

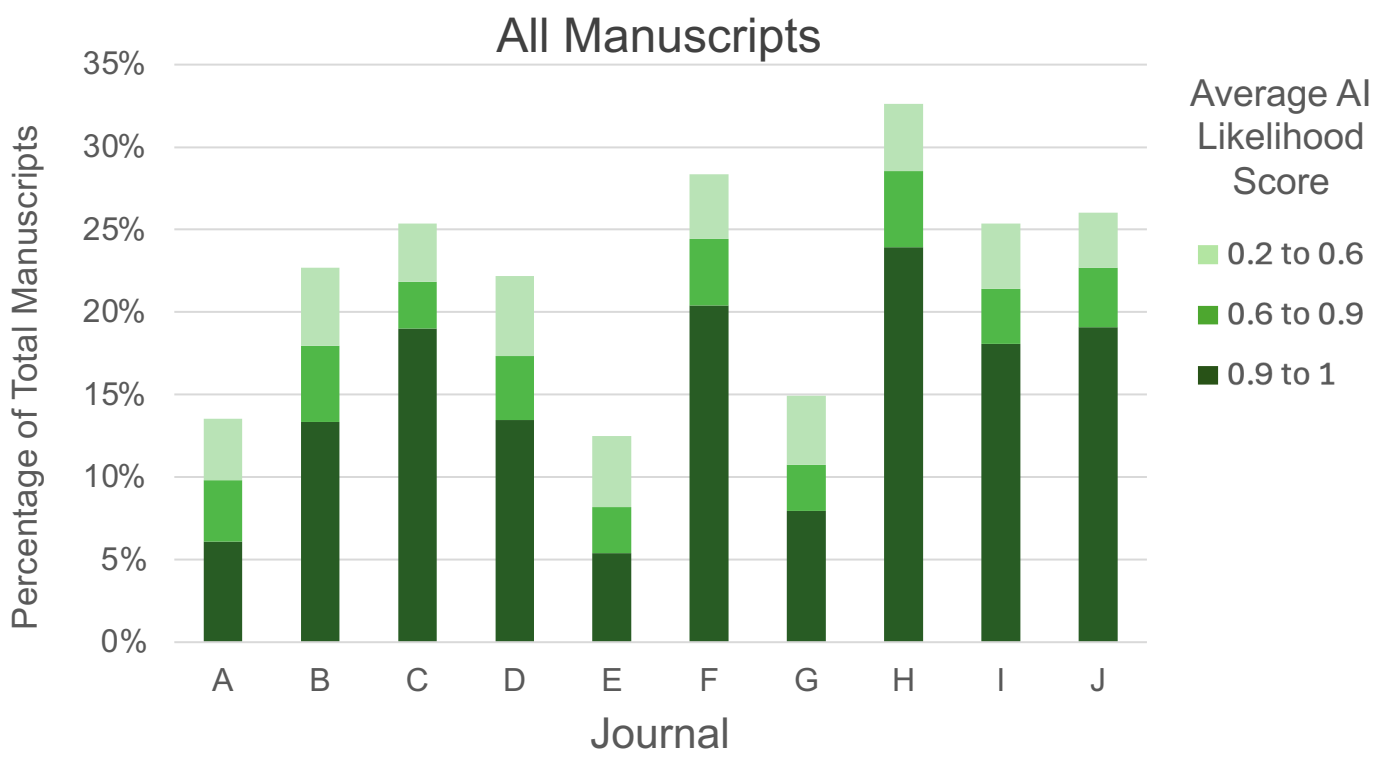
| Text Type | Fold Difference |
|---|---|
| Abstract text | 2.3 |
| Methods text | 3.0 |
| Reviewer comments | 1.9 |

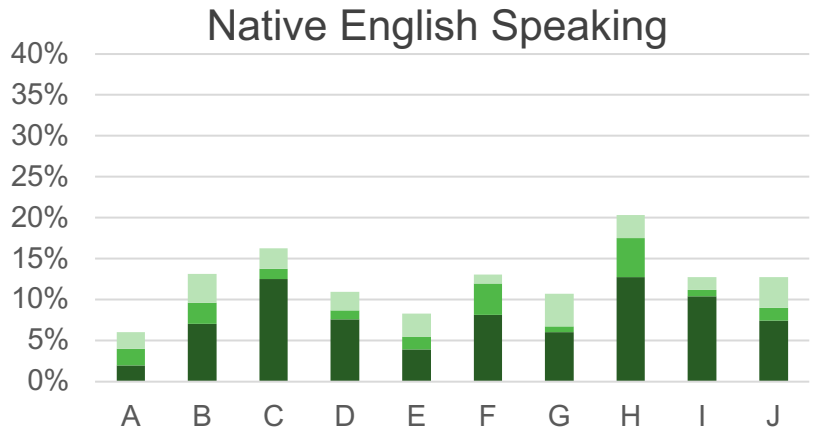


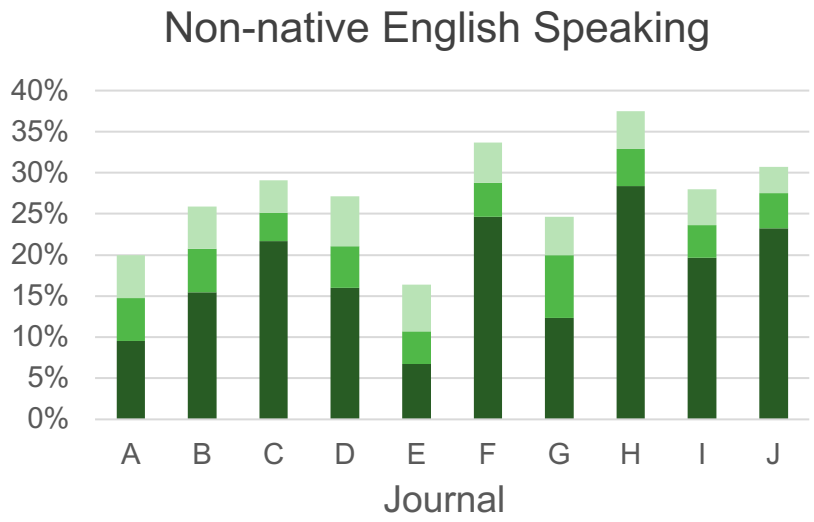
# Association of Journal with Use of GenAI

American Association for Cancer Research®
FINDING CURES TOGETHER®

- Original research manuscripts submitted in 2024 (8318 abstracts)



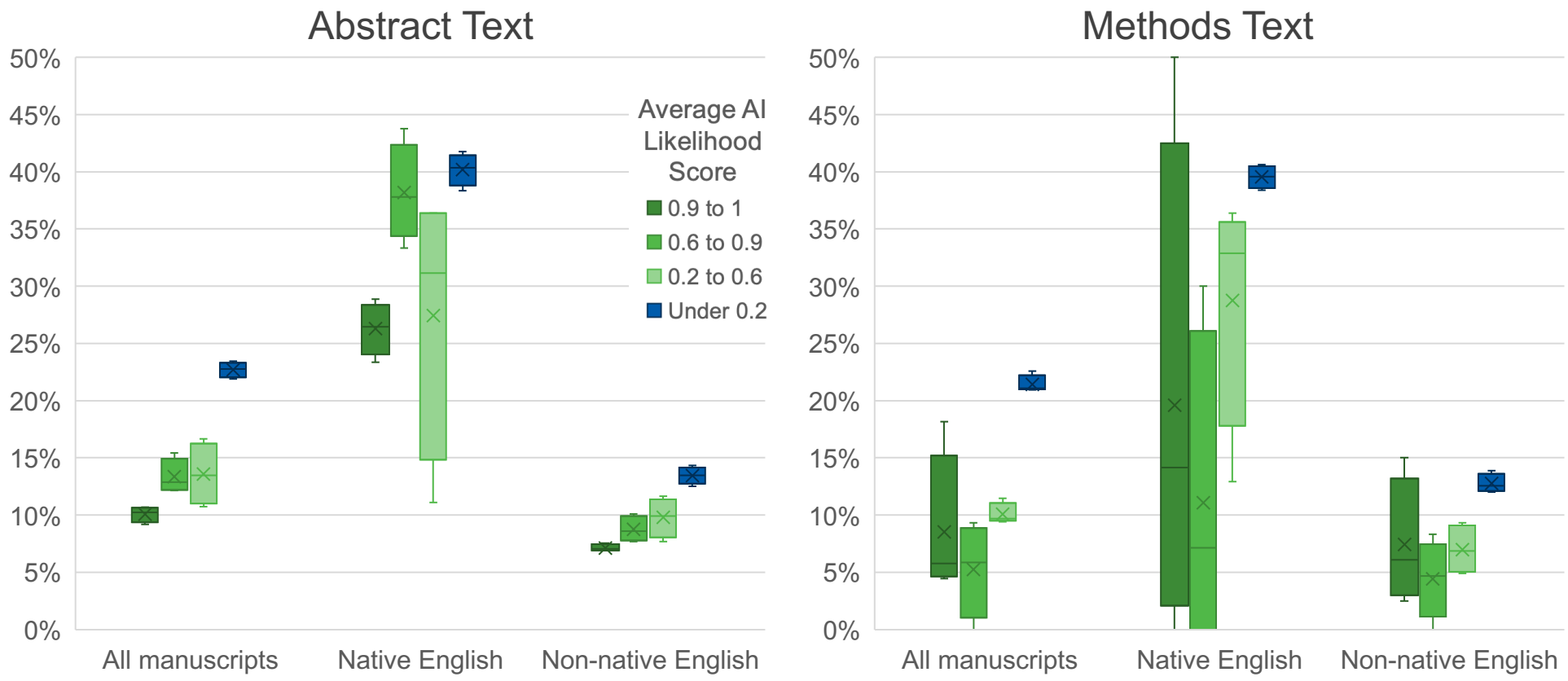




No single journal characteristic is associated with the differences in use of GenAI by its authors

# Association of Use of GenAI with the Editorial Decision to Send the Manuscript for Peer Review

American Association for Cancer Research®
FINDING CURES TOGETHER®

- Calculated the percentage of manuscripts sent out to review in each quarter of 2024 and plotted the results.




AI-generated text in the abstract was associated with a >50% decrease in the likelihood of the manuscript being sent for peer review.

The difference was more pronounced for AI-generated text in the methods.

The association applied regardless of native or non-native English classification.

# Author Disclosure of the Use of AI versus what is Detected (Manuscripts submitted January 1 to June 30, 2025)

American Association for Cancer Research®
FINDING CURES TOGETHER®

| Author Disclosure of AI Use | # MSs |
|---|---|
| Improve the quality of the writing for a specific section(s) of the manuscript | 379 |
| Improve the quality of the writing for the entire manuscript (excluding references) | 148 |
| Translate the manuscript into English | 67 |
| Obtain background information/research on a specific topic(s) | 46 |
| Analyze data | 25 |
| Generate text for a specific small section(s) of the manuscript | 20 |
| Generate a first draft of the abstract | 16 |
| Visualize data | 13 |
| Generate a first draft of the introduction | 12 |
| Generate an image | 12 |
| Generate a first draft of the discussion | 7 |
| Generate a first draft of the methods | 5 |
| Generate data | 5 |
| Generate a first draft of the entire manuscript | 3 |
| Generate a first draft of the results | 1 |
| **Total unique declarations** | **759** |
| **Total manuscripts with one or more declarations** | **636** |

| Category of Manuscript | # MSs |
|---|---|
| All Manuscripts | 7177 |
| GenAI use detected in abstract text | 2580 |

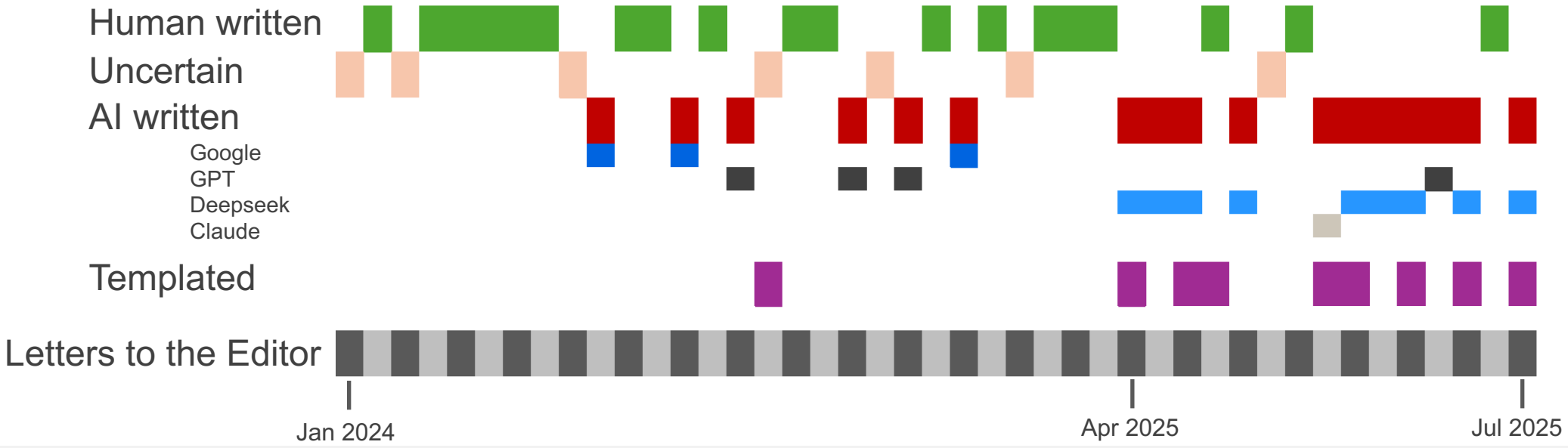
| Category of Manuscript | # MSs |
|---|---|
| Disclosure % | 9% |
| Detection % | 36% |

Less than 25% of authors using GenAI to assist with the writing of original research articles are disclosing this use.

# Use of GenAI Detection and Characterization to Identify Fraudulent Submissions

American Association for Cancer Research®
FINDING CURES TOGETHER®

- Letters to the Editor submitted to one AACR journal were classified as human written, AI written, or of uncertain principal authorship. All AI-written letters were rejected without consideration until April 22, 2025—when the author was notified of positive consideration. The next AI-written letter was submitted April 26, followed by others in rapid succession.
- Notably, these were mostly generated by Deepseek and the majority followed a single easily human-identifiable template.



# Acknowledgments

I'd like to thank the following people for their invaluable assistance on this project

- **John Ho (AACR)** – For pulling manuscript data, sending it to Pangram, and retrieving the results.
- **Bradley Emi (Pangram)** – For first reaching out to me and for the many helpful discussions and work fine-tuning the detection for AACR content.
- **Max Spero (Pangram)** – For helpful discussions and feedback.