

KEEPING PACE WITHOUT AI? THE AI-FREE CAUCUS ON ARXIV

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ABSTRACT. The Association for Human Mathematics lists 809 mathematicians who commit to not publishing texts generated by AI, and 532 of them state that they do not use AI models in their research at all. I compare the arXiv output of these mathematicians with that of all other authors of arXiv mathematics papers, following an analysis plan that was fixed before any result was computed. From the five years before ChatGPT to the two years after the first reasoning models, the output per author of the AI-free group grew by 15%, almost exactly as much as that of comparable mathematicians, whose output grew by 17%. Only in the summer of 2026, when the number of all arXiv mathematics papers suddenly doubled, did the comparable mathematicians pull ahead, with an interval that only just excludes no difference. The AI-free group mentions AI tools less often, writes more coauthored papers than before and is closely connected by coauthorship.

1. INTRODUCTION

Since the end of 2022, large language models have become a normal tool for many mathematicians, and with every new model they have become more useful for research. A natural guess is that this shows up in the number of papers people write. At the same time, a group of mathematicians decided not to use these tools at all. The Association for Human Mathematics (AHM) describes itself as protecting “mathematics as a human endeavor against the threat of artificial intelligence” [AHM]. All of its members commit to “not publishing mathematical texts [...] generated by AI models”, and the members of its AI-free caucus state that they “do not use AI models in a research capacity” [AHMm]. On 11 October 2026 the public member list had 809 members, and 532 of them belonged to the caucus.

This makes it possible to ask a simple question with public data only. Did the arXiv output of mathematicians who say that they do not use AI develop differently from the output of comparable mathematicians? If AI tools make people write more papers, one would expect the output of the other mathematicians to go up after the arrival of the tools, and the output of the caucus to stay where it was.

Since such a question invites looking at the data until something interesting appears, I wrote down the whole analysis before computing any trend: the groups, the time periods, who is counted, how the groups are made comparable, the main number and all further questions. The plan is described in Section 3, and every number it asks for is reported below, whatever its direction. Everything else is marked as exploratory. The main results are the following.

Date: Version 2, 11 October 2026.

Finding 1 🍌. *Comparing October 2017 to September 2022 with October 2024 to September 2026, the output per author of the AI-free caucus grew by 15% and that of comparable mathematicians by 17%. The ratio of the two growths is 1.02, with 95% interval [0.93, 1.12].*

So over the two years after the first reasoning models there is no visible difference between the caucus and comparable mathematicians, and the before-trends of the two groups agree remarkably well (Figure 1). The picture changes in the last three months of the data.

Finding 2 🦋. *In July to September 2026, comparable mathematicians wrote 52% more papers than in the same months of 2025, while the caucus wrote 13% more. The ratio is 1.35, with interval [1.00, 1.81]. One year earlier it was 0.81.*

These are the months in which Claude Fable 5 and GPT-5.6 Sol became available, followed in September by GPT-6 Astra and Claude Opus 5.5. The interval only just excludes no difference and it is one of many comparisons, so I read this as a hint, not as a result. Also the share of caucus members whose output suddenly jumped is in 2026 as large as in earlier years, while it rose clearly for comparable mathematicians (Section 6). All this fits a development that is visible without any group comparison and which I did not plan to look at.

Finding 3 🦉. *The number of all arXiv mathematics papers per month doubled from September 2025 to September 2026. This growth appears in all fields and among established authors, and the share of single-author papers rose from about a quarter to more than a third.*

Finally, the papers themselves differ in a few ways that one would expect.

Finding 4 🍌. *Since 2024 papers of the reference group mention AI tools more often than papers of the caucus, while words typical for language models do not separate the groups. Members of the caucus write papers with each other five times as often as chance would predict.*

Let me also say what this note does not do. It does not say anything about individual people. A single mathematician can write more papers for many ordinary reasons, for example a new student, a new collaboration or a long project that is finally finished. The caucus statement is about how its members work now, and the AHM explicitly welcomes people who used AI before joining, since “individuals’ viewpoints and circumstances evolve” [AHMf]. So the comparison is only between groups.

2. DATA

2.1. arXiv. arXiv offers the metadata of all its papers through the OAI-PMH interface [OAI]. I downloaded the records of every paper with at least one mathematics category, cross-lists included, on 11 October 2026. This gives 792,316 papers. For each paper I use the month of its first version, the categories, the list of authors, the abstract and the comment field. The month of the first version can be read off the arXiv identifier, for example 2610.05465 was first submitted in October 2026.¹ As a check, the number of papers per month agrees exactly with the official counts of arXiv [arXs] in all 46 months I compared (the twelve months of 2019, 2022 and 2025, and January to October 2026).

¹The field `created` of the OAI-PMH records is not the date of the first version. For the paper 1004.4645, first submitted in April 2010, it shows 26 February 2021.

2.2. Authors. arXiv has no author identifiers, so authors have to be recognized by their names. I identify an author with the pair of the first forename and the last word of the family name, after removing accents, capitalization and punctuation. The last word is used because the arXiv metadata splits family names of several words in different ways, for example into the forenames “François Le” and the family name “Maître”. Names whose forenames are only initials are left out. Two people with the same name become one author. This happens in all groups in the same way, and I made no manual corrections, because corrections in only one group would make the groups less comparable. In total the data has 274,092 different authors.

2.3. The AHM list. The member list on the AHM website is loaded from a public file, which I downloaded on 11 October 2026. It contains the name, the affiliation and whether the member belongs to the AI-free caucus. The list shows the order of joining, but no dates, and it is updated about once a week. Members are matched to arXiv authors with the same rule as above. Of the 531 caucus members with a usable name, 419 appear as authors of arXiv mathematics papers, and 250 of the 276 other members.

3. METHOD

3.1. Groups and time periods. The three groups are the members of the AI-free caucus, the other AHM members, and all other authors of arXiv mathematics papers, which I call the reference group. Time is divided into twelve-month periods from October to September, so that the last complete period ends in September 2026. I compare

- *before*: October 2017 to September 2022, before ChatGPT,
- *after*: October 2024 to September 2026, from the first reasoning models on.

The two years in between, from ChatGPT (30 November 2022) to the first reasoning models (12 September 2024), are left out of the comparison.

3.2. Who is counted. In all groups I count the authors with at least one paper before and at least one paper in the two years in between. The second condition is important. AHM members are, by joining, still active mathematicians in 2025 or 2026, while many authors of the reference group have left mathematics in the meantime. Requiring a paper in the two years in between puts both groups on the same footing, without using the years in which the outcome is measured. With this rule 237 members of the caucus, 175 other members and 58,203 authors of the reference group are counted.

3.3. Making the groups comparable. The members of the caucus are not a random sample of mathematicians (see Section 8). They differ in field, in the length of their career and in how many papers they write. For this reason the reference group is reweighted to look like the caucus. Every author falls into one of 120 cells, given by the year of the first paper (five ranges), the number of papers before (four ranges) and the main field (six groups of arXiv categories). Within each cell the reference group gets the weight that the cell has in the caucus. No member of the caucus falls into a cell without authors of the reference group.

3.4. The main number. For each group I take the average number of papers per author and year after, divided by the same average before. This is the growth of the group. The main number is

$$\frac{\text{growth of the reweighted reference group}}{\text{growth of the caucus}},$$

with a 95% bootstrap interval from 2000 resamples of the authors. A value above 1 means that output grew more outside the caucus than inside.

3.5. Further questions. The plan also lists ten further questions, each again comparing the change from before to after between the groups: the use of words typical for language models in abstracts, explicit mentions of AI tools, the length of papers, the size of author teams, the background of AHM members, coauthorship within the caucus, how often papers are revised soon after the first version, the same questions for number theory only, and the trends of all of these per year. I dropped the question about revisions before computing it, since it needs a second complete download of the version histories. Before seeing any result I added one more question, namely whether the summer of 2026, after the releases of Claude Fable 5 and GPT-5.6 Sol, looks different. With this many comparisons some intervals will exclude the neutral value by chance alone, so only the main number should be read as a test.

4. THE MAIN COMPARISON

Table 1 shows the main numbers. The output of the caucus grew by 14.6%, that of the reweighted reference group by 16.7%, and the interval for the ratio contains 1 comfortably. This result does not change if I remove the 23 caucus members whose name search on arXiv needed a manual check, i.e. where most hits lie outside mathematics or only initials were found: the ratio is again 1.02, with interval $[0.93, 1.12]$.

TABLE 1. Growth of the output per author from before to after.

group	authors	growth	reference, reweighted	ratio	95% interval
AI-free caucus	237	1.15	1.17	1.02	$[0.93, 1.12]$
other AHM members	175	1.39	1.14	0.82	$[0.73, 0.91]$
all AHM members	412	1.25	1.15	0.92	$[0.86, 1.00]$

Notice that the reweighting matters. Without it, the reference group grew by 25%, because it contains many young authors whose output is still increasing. Reweighted to the composition of the caucus, which is older and more productive, its growth is 17%.

Figure 1 shows the whole development since 2012. Before ChatGPT the caucus and the reweighted reference group move almost in parallel, which is the best sign one can hope for that the reweighting works. After 2022 the two curves cross several times, and in the last period the reference group is ahead by about 6%.

There is one surprise in Table 1, and it goes in the other direction. The output of the other AHM members, who are not in the caucus, grew by 39%, clearly more than that of comparable mathematicians. I have no explanation that the data could test. Notice only that these members did not commit to avoiding AI tools in research, but only to not publishing texts generated by them.

5. THE SUMMER OF 2026

Figure 2 shows the output per author month by month, together with some of the model releases of OpenAI, Anthropic and Google (see Table 5 for dates and sources). Until the summer of 2026 the curves of the caucus and of the reweighted reference group stay close together. Then the reference group moves up steeply, and the caucus does not follow.

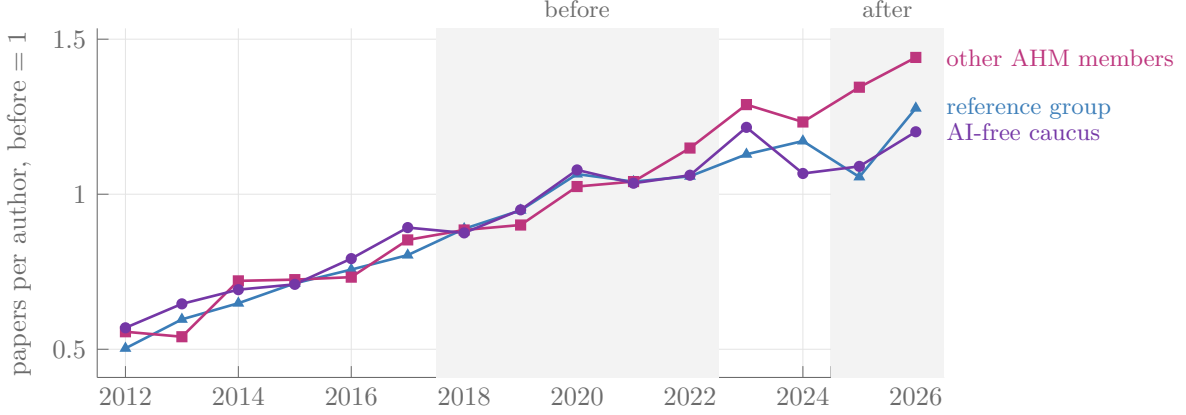


FIGURE 1. Papers per author and year, relative to the average of the before period, for October-to-September periods named after the year in which they end. The reference group is reweighted to the caucus. Grey: the two periods that are compared.

The figure also shows a peak of the caucus at the end of 2025, and I checked where it comes from. This check was not planned, so it is exploratory. In October to December 2025 the counted members of the caucus had 126 different papers, against 91 to 108 in the same months of 2019 to 2024, which is the largest excess over the trend since 2018. It is not caused by papers with several members or by a single person, but by a few members who had a very productive quarter at the same time, with four to six papers each, mostly with coauthors and in quite different fields. None of these papers mentions an AI tool, and only two of the abstracts contain one of the typical LLM words. The peak also starts in October 2025, a month before Gemini 3, and the reference group shows no such peak, so the timing does not fit a model release either.

Notice that the summer of 2026 had a whole series of releases: Claude Fable 5 was available again from 1 July, GPT-5.6 Sol from 9 July, GPT-6 Astra from 3 September and Claude Opus 5.5 from 22 September [Ant1, DN, CNBC, Ant2]. So even if the change is real, it cannot be attributed to one model. Finding 2 🦋 puts a number on it. In July to September 2026 the counted members of the caucus had 104 papers, against 92 in the same months of 2025 (a paper by two members counts twice), while the reweighted reference group wrote 52% more. The ratio is 1.35 with interval [1.00, 1.81]. Notice that in the year before, from 2024 to 2025, the ratio was 0.81 with interval [0.60, 1.11], so the reference group was not ahead before. For the other AHM members the ratio for 2026 is 1.19, with interval [0.91, 1.54]. Three months are short, a paper takes time to write, and about a hundred papers per summer are not many, so I would not build anything on this number alone.

What makes it interesting is the development of arXiv mathematics as a whole, shown in Figure 3. This was not part of the plan and I found it while checking the data, so it is exploratory. After years of slow growth, the number of papers per month rose from 5,144 in September 2025 to 6,454 in June 2026, 7,331 in August and 10,284 in September 2026. These numbers are exactly the official ones of arXiv [arXs].

Newcomers do not explain the growth. The share of papers without any author who had posted a mathematics paper at least two years earlier stays at about 13% throughout. It is also not limited to one field, since from September 2025 to September 2026 the number of

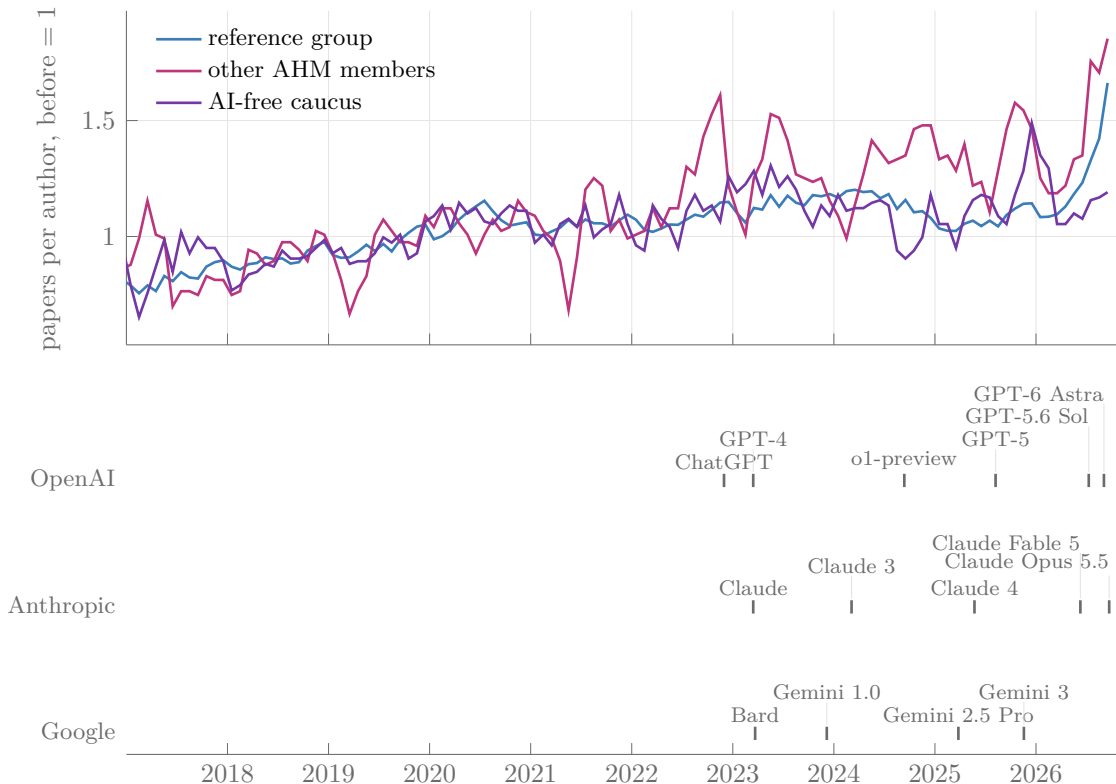


FIGURE 2. Papers per author, averaged over three months and relative to the before period. The reference group is reweighted to the caucus. Below: some model releases.

papers roughly doubled in algebra and number theory, in analysis and in probability, grew even more in combinatorics and in geometry and topology, and grew by about two thirds in the remaining, mostly applied, fields. What did change is the share of single-author papers, which was between 25% and 26% in each year from 2022 to 2025, and rose to 31% in June and 36% in September 2026 (Figure 4). Together with the dates, this fits the idea that the newest models can take over part of the work that used to need a collaborator. Of course the data cannot show this.

6. SUDDEN JUMPS

A natural follow-up question is whether some members of the caucus behave like the rest of mathematics in 2026, i.e. whether their output suddenly jumped. This question was not part of the plan, so this section is exploratory. It also cannot say anything about a single person, since the output of one author jumps for many ordinary reasons, and it can also jump because coauthors use AI tools. What can be compared is how often such jumps happen in a group.

For each counted author I compare the number of papers in April to September of a year with the author's own average per half-year before, i.e. from October 2017 to September 2022. I say that the output doubled if there are at least two papers and at least twice the own average, and that it tripled if there are at least three papers and three times the own average. Table 2 shows how often this happens.

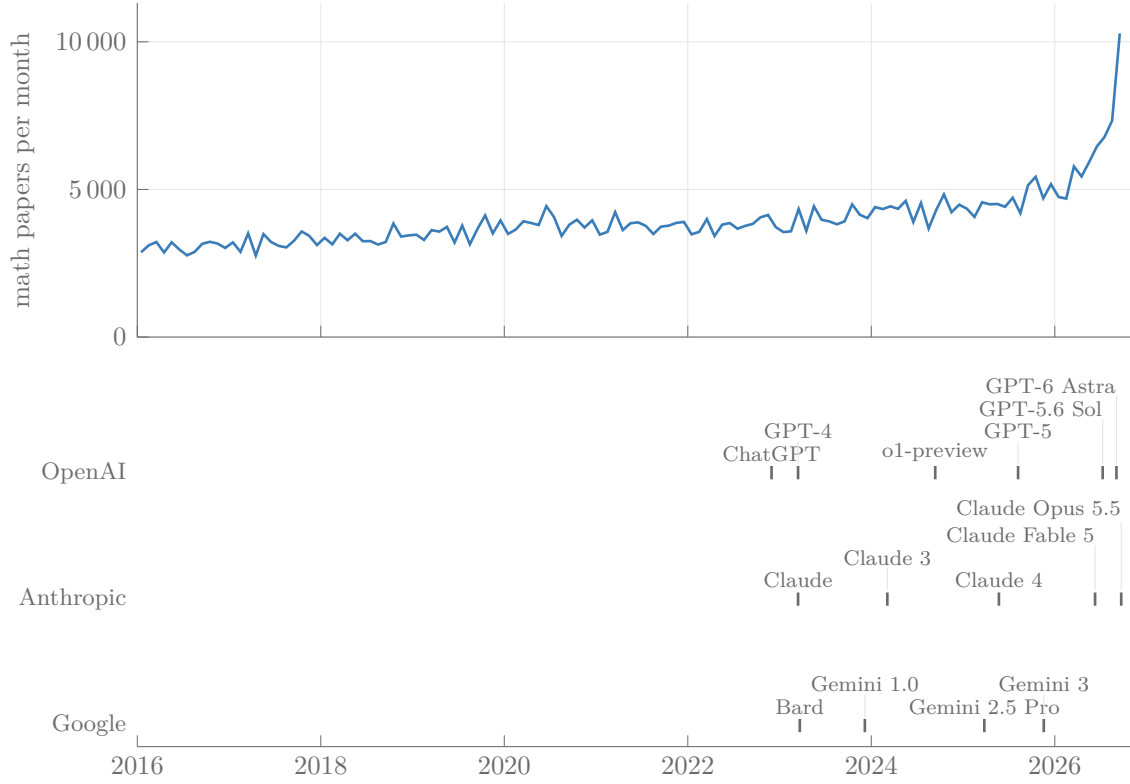


FIGURE 3. All arXiv mathematics papers per month, cross-lists included (exploratory). Below: some model releases.

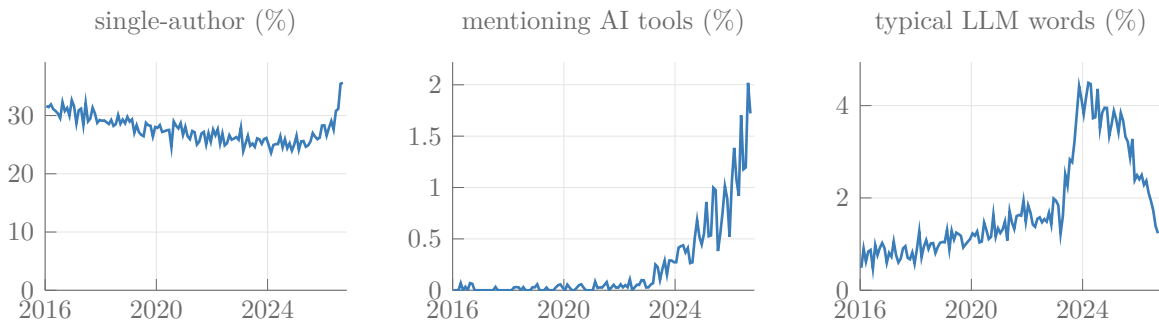


FIGURE 4. Shares among all arXiv mathematics papers per month (exploratory): single-author papers, papers whose abstract or comment mentions an AI tool, and abstracts with at least one word typical for language models.

In the caucus such jumps happen in 2026 about as often as before. The output of 12.7% of the members doubled, while from 2019 to 2025 this share lay between 7.2% and 11.8%, and the interval for the difference to the earlier average is $[-1.4, +7.4]$ percentage points. In the reweighted reference group the share rose from at most 12.5% in earlier years to 17.9%, and the share of authors whose output tripled went from 2.6% to 7.4%. So in 2026 the caucus has fewer jumps than comparable mathematicians, with interval $[-9.2, -0.8]$ percentage points for the difference. The other AHM members behave like the reference group. Notice

TABLE 2. Share of authors (in percent) whose output in April to September doubled or tripled compared with their own average before. For 2019 to 2025 the average over the seven years is given.

	doubled		tripled	
	2019 to 2025	2026	2019 to 2025	2026
AI-free caucus	9.9	12.7	2.1	3.4
other AHM members	12.9	18.3	3.2	7.4
reference group, reweighted	10.8	17.9	2.6	7.4

that about one in eight members of the caucus doubled the output in 2026, just as often as in earlier years, so a jump of a single author is no sign of anything.

The papers of the caucus confirm this picture. From April to September 2026 the counted members wrote 192 different papers, against 191 in the same months of 2025, and the share of single-author papers changed from 12.0% to 13.5%. Fewer than 1% of their papers from 2026 mention an AI tool, and 2% of the abstracts contain one of the typical LLM words of [Section 7](#), about as many as among all mathematics papers of 2026.

7. TRACES OF AI IN THE PAPERS

The plan contains two questions about traces of AI in the papers themselves. One of them counts abstracts with at least one word that became much more frequent with language models. Its list of words was fixed in the plan and contains words such as *delve*, *intricate*, *showcasing*, *pivotal* and *realm*. Studies of scientific abstracts found an abrupt increase of such style words after the arrival of ChatGPT [[K](#), [L](#)], and Liang et al. name *realm*, *intricate*, *showcasing* and *pivotal* as the words most disproportionately used by language models [[L](#)]. They also found that mathematics showed the smallest increase of all fields they studied. The second question counts papers whose abstract or comment names an AI tool or a language model.

[Table 3](#) and [Figure 5](#) show the results. Mentions of AI tools rose in the reference group by 0.60 percentage points per author and in the caucus by 0.16, and the interval for the difference excludes zero. For the other AHM members the picture is the same. This is what one would expect, although a mention of an AI tool can also be a paper about AI.

The style words do not separate the groups. One reason is visible in [Figure 4](#): among all mathematics papers they peaked in March 2024 with 4.5% of the abstracts and then fell to 1.2% in September 2026. Newer models apparently write differently, or authors learned to avoid these words, so the marker is weakest exactly in the after period.

8. HOW THE GROUPS DIFFER

8.1. Teams and length. The share of single-author papers fell in the caucus by 11.6 percentage points and in the reweighted reference group by 3.7, and the number of authors per paper grew more in the caucus ([Table 3](#)). Both intervals exclude zero. Part of this is a catching up, since the caucus wrote more single-author papers than the reference group for many years and the curves meet in 2025 ([Figure 5](#)). In any case, the caucus did not become

TABLE 3. Change from before to after, per author, for the caucus and the reweighted reference group. The difference is reference minus caucus.

	caucus	reference	difference	95% interval
abstracts with typical LLM words (points)	+2.2	+1.2	-1.1	$[-3.3, +0.6]$
papers mentioning AI tools (points)	+0.16	+0.60	+0.45	$[+0.08, +0.67]$
median number of pages	+3.0	+3.1	+0.1	$[-5.7, +4.9]$
single-author papers (points)	-11.6	-3.7	+7.9	$[+3.2, +12.2]$
authors per paper	+0.61	+0.23	-0.39	$[-0.79, -0.10]$

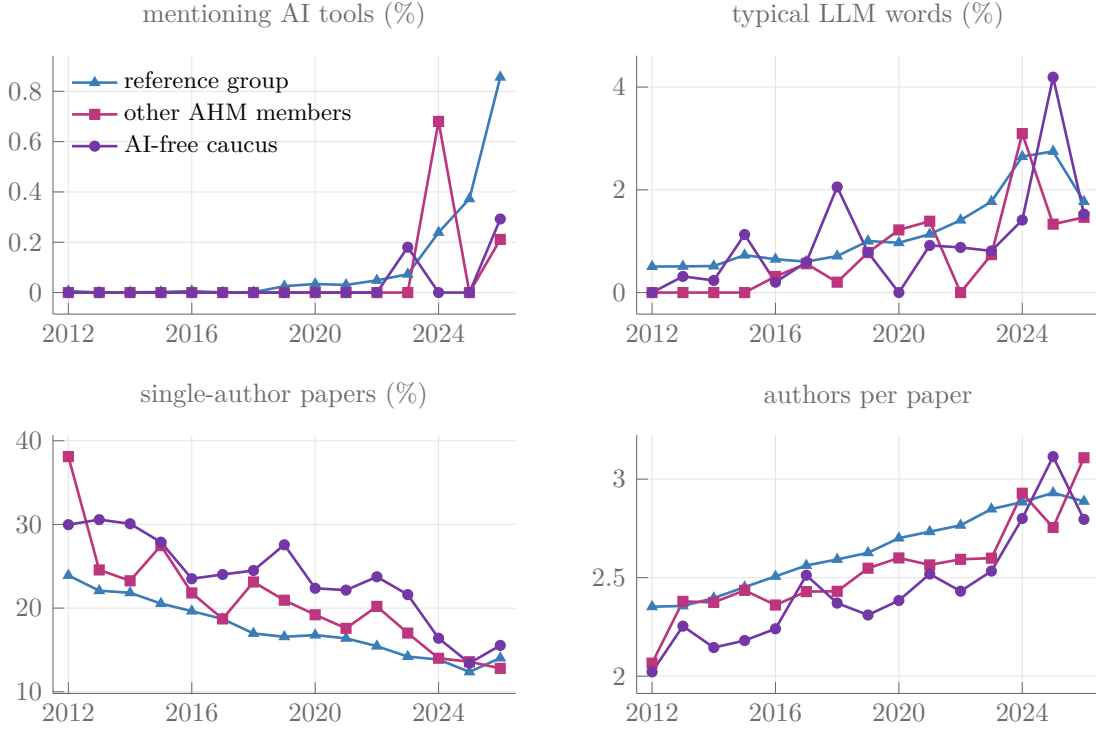


FIGURE 5. Further questions per period: averages over the authors with a paper in the period. The reference group is reweighted to the caucus.

more solitary. The length of papers, read from comments such as “23 pages”, grew by about three pages in both groups. Only about half of the papers state their length.

8.2. Who joins. Table 4 compares the counted members with the counted authors of the reference group. Members of the caucus work much more often in algebra, number theory, geometry and topology, and much less often in applied fields. They started their careers earlier and wrote more papers before 2022. The other AHM members look very similar.

8.3. Coauthorship. Among the distinct coauthors of caucus members, 3.3% are themselves in the caucus. If one picks a random group of the same size and the same composition 1000 times, this share is on average 0.6%, lies between 0.2% and 1.0% in 95% of the cases, and never reaches the observed value. So the caucus is a well connected group, which is not surprising if such an initiative spreads through departments and collaborations.

TABLE 4. Composition of the counted authors (shares in percent).

	caucus	other members	reference
algebra and number theory	33	39	16
geometry and topology	20	21	9
analysis	23	13	29
combinatorics and logic	13	14	10
probability and statistics	5	6	9
other fields	5	7	26
first paper up to 2010	43	36	27
first paper 2020 to 2022	16	15	25
eight or more papers before	35	39	25

9. NUMBER THEORY

Restricted to papers with the category `math.NT` and to authors with such papers before and in between, only 30 members of the caucus and 30 other members remain. Their output grew by 20% and 7%, against 14% and 16% for the reweighted reference group, with ratios 0.95 and 1.08 and intervals $[0.70, 1.40]$ and $[0.88, 1.41]$. The groups are too small to say anything, in either direction.

10. A SIDE EFFECT OF THE PUBLIC LIST

Since the member list of the AHM is public, it is easy to find, together with arXiv, a large set of recent papers written without AI tools. This has a side effect that does not depend on the numbers above. Such papers may contain good ideas whose consequences were not pushed as far as current models would allow, and others can take exactly these papers as starting points and try to extend them with AI tools. In mathematics it is normal that a paper invites follow-up work by others, but with these tools the follow-up may come much faster than before, and the authors of the original paper may find the natural next questions of their own work answered by someone else. The data of this note says nothing about whether this happens. I mention it because a public list of authors who do not use AI makes this kind of follow-up easier to find and to organize. To be honest, this thought also came to my mind when I first came across the list, and this note grew out of looking at the list more closely.

11. LIMITS

Membership is a choice, and this is the most important limit. People who join the AHM may differ from other mathematicians in ways that the reweighting does not capture, and the clear surprise of [Section 4](#), the strong growth of the other members, shows that such differences exist. A difference between the groups is therefore not an effect of avoiding AI, and the absence of a difference is not a proof that AI has no effect on output.

The identification of authors by names merges people with the same name and splits people who publish under different forms of their name. For the members I checked the matches against a separate search for each name on arXiv, and found, for example, a member who shares the name with a much more prolific mathematician at another university. Such errors

occur in the reference group in the same way, but they add noise. The caucus statement also describes how its members work now, and some of them may have used AI tools in 2023 and 2024.

Finally, the after period ends in September 2026, and the strongest changes in [Figures 2](#) and [3](#) happen in its last months. A repetition of this comparison one year from now will say much more.

Data. All data used here is public. The figures are drawn from aggregated tables that contain no names. Data about individual people, i.e. the matching of members to arXiv authors, is not published.

AI & Taco disclosure. I write as TacoYaci. The question, the decision to fix the analysis in advance and the further question about the summer of 2026 are mine. Claude Code with Opus 5.5 collected the data, wrote and ran the analysis, made the figures and drafted the text, following the plan.

APPENDIX A. MODEL RELEASES

TABLE 5. Model releases shown in [Figures 2](#) and [3](#).

date	company	model	source
30 November 2022	OpenAI	ChatGPT	[Wi1]
14 March 2023	OpenAI	GPT-4	[SEJ]
14 March 2023	Anthropic	Claude	[Wi3]
21 March 2023	Google	Bard	[Wi5]
6 December 2023	Google	Gemini 1.0	[Wi6]
4 March 2024	Anthropic	Claude 3	[Wi3]
12 September 2024	OpenAI	o1-preview	[Wi2]
March 2025	Google	Gemini 2.5 Pro	[Wi5]
22 May 2025	Anthropic	Claude 4	[Wi3]
7 August 2025	OpenAI	GPT-5	[Wi4]
18 November 2025	Google	Gemini 3	[Wi7]
9 June 2026	Anthropic	Claude Fable 5	[Ant1]
9 July 2026	OpenAI	GPT-5.6 Sol	[DN]
3 September 2026	OpenAI	GPT-6 Astra	[CNBC]
22 September 2026	Anthropic	Claude Opus 5.5	[Ant2]

Claude Fable 5 was unavailable from 12 June to 1 July 2026 [\[Ant1\]](#). GPT-5.6 Sol was generally available from 9 July 2026, after a preview for partners from 26 June [\[DN\]](#).

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