Peer-reviewing processes and incentives : data management community survey results

Peer-Reviewing Processes and Incentives: Data Management Community Survey Results

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Abstract

Reviewing papers for conferences is an important and hard task that brings several challenges. The Data Management community has been increasingly struggling with high reviewer load, low-quality reviews and low reviewer engagement, unethical reviewing practices as well as undeclared and under-declared conflicts of interest. In this article, we report the results of a survey we conducted to gather the opinion of the Data Management community regarding what could be done to address these challenges. We reached out to about 1,200 members of the data management community with relevant reviewing experience and collected 345 anonymous responses. We plan to follow up with a subsequent report, discussing in more depth particular proposals, inspired by the collective feedback from the community.

1 Challenges and Mission

The Data Management research community has worked towards important innovations in our submission and reviewing processes across many of our venues. Examples include the implementation of multiple submission cycles, opportunities for author feedback and revisions, promotion of reproducibility and data sharing, manual checks for review quality, automated COI checks, etc.
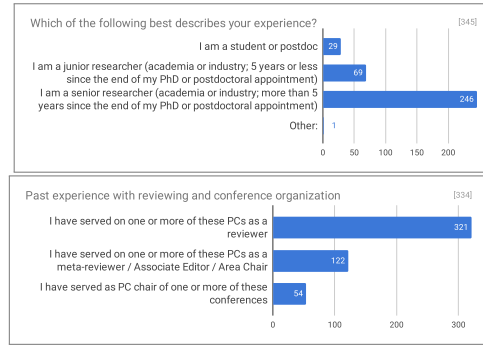

Figure 1: Summary of participants' seniority (left) and reviewing experience (right). Most respondents were senior researchers (71%), and about 16% overall have served in the role of PC chair.

However, we also struggle with pain points that have been exacerbated in recent years, as we observe increased reviewer fatigue and declining engagement, as well as challenges with improper conflict declaration. These issues compromise the effectiveness, efficiency, and integrity of our processes. We briefly discuss them here.

- **High reviewer load:** With several deadlines through the year, author feedback phases [2], revision cycles, and participation on multiple PCs, reviewers are often overloaded. The issue is not simply with the number of papers one is called to review, but with the fact that reviewing responsibilities often span the entire year, making it hard for reviewers to plan these around their other career and personal responsibilities.

- **Low-quality reviews and low reviewer engagement:** Our community has been observing an uptick on reviews that are terse, dismissive, and unconstructive. Some reviewers do not respond promptly, or at all, to requests to contribute to discussion, or update their reviews. Late reviews are widespread, reducing the effectiveness of the author feedback and discussion processes. As an example, in the first three submission cycles of SIGMOD 2024, only about 20% of submissions had all three reviews by
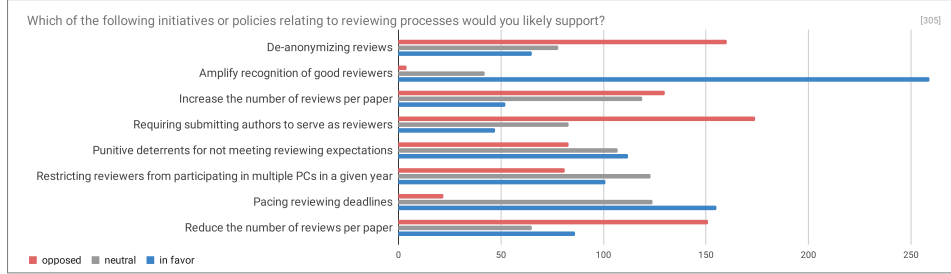
Figure 2: Aggregate responses on the reviewing processes initiatives. There is strong support for amplifying the recognition of good reviewers and for pacing reviewing deadlines; we observe clear opposition to de-anonymization of reviews and requiring submitting authors to serve as reviewers. Other proposals received more split feedback.

the review deadline; a little under 20% of submissions were still missing at least one review 5 days after the deadline; about a dozen submissions were still missing reviews 10 days after the deadline.

- **Unethical reviewing practices:** We want to ensure processes that guard against coordination and collusion between authors and reviewers to get papers accepted, resulting in dishonest reviews [3]. Such reviews often are of low quality and superficially positive regardless of the content of the papers.

- **Undeclared and under-declared conflicts:** Authors often fail to accurately declare conflicts of interest (COI) with the PC, resulting in burdensome inefficiencies in paper assignment, and potential conflicts in assignments if those are not caught in time. Despite efforts to support conflict entry, grace periods for COI entry, and personalized reminders to authors who fail to complete this task, the problem stubbornly persists.

Several of our executive bodies have called together a task force to collect community feedback and propose policies and initiatives to help address these issues. The joint task force is chaired by Sourav Bhowmick (Nanyang Technological University) and Alexandra Meliou (University of Massachusetts Amherst), and includes the following members: Karl Aberer (Chair of the ICDE Steering Committee), Divy Agrawal (Chair of the ACM SIGMOD Executive Committee), Angela Bonifati (President of the EDBT Executive Board and Association), Vanessa Braganholo (PVLDB Advisory Board), Floris Geerts (Chair of the PODS Executive Committee, ICDT Council member), Wolfgang Lehner (Managing Editor of PVLDB), Divesh

Srivastava (President of the VLDB Endowment Board of Trustees).

One of the first initiatives of the task force was the release of a community survey. In this report, we discuss survey participation, present the questions posed, and summarize some aggregate results. The task force plans to work on and release recommendations for possible policies and initiatives in a subsequent report.

2 Survey description and results

The survey was advertised by direct email to a list of about 1,200 data management researchers who have served on relevant Program Committees in recent years. We avoided broader advertisement on social media and mailing lists such as DBWorld, as we wanted to keep the survey audience targeted to researchers who have had some experience with reviewing tasks in data management venues. The landing page of the survey introduced participants to the objectives of the survey, summarizing the bullet point list in Section 1. The survey made responses optional, meaning that participants could choose not to answer some of the questions. The survey did not collect identifying information from the participants, and we obtained Institutional Review Board (IRB) approval for processing and analyzing the results.

A total of 379 people engaged with the survey in some capacity (i.e., they at least clicked on the link) and 345 submitted answers to at least one question. The survey organized questions in the following sections: (1) general information on the participants' experience; (2) feedback on reviewing process policies; (3) feedback on submission policies; (4) expectations on the role of Associate Editors and meta-reviewers; (5) feedback on reviewing culture initiatives; and (6) general free-text feedback. In the discussion of each question, we will report the number of participants who engaged with the question and submitted responses.

2.1 General Information on Participants

The first section of the survey requested information on participants' seniority and experience in reviewing and conference organization. The question on experience specified a list of data management venues (SIGMOD, VLDB, PODS, ICDE, EDBT, ICDT), and asked participants to indicate whether they have served in reviewing, meta-reviewing, or PC-Chair roles (multiple answers could be selected). A total of 345 and 334 participants responded to the seniority and experience questions, respectively. The results are shown
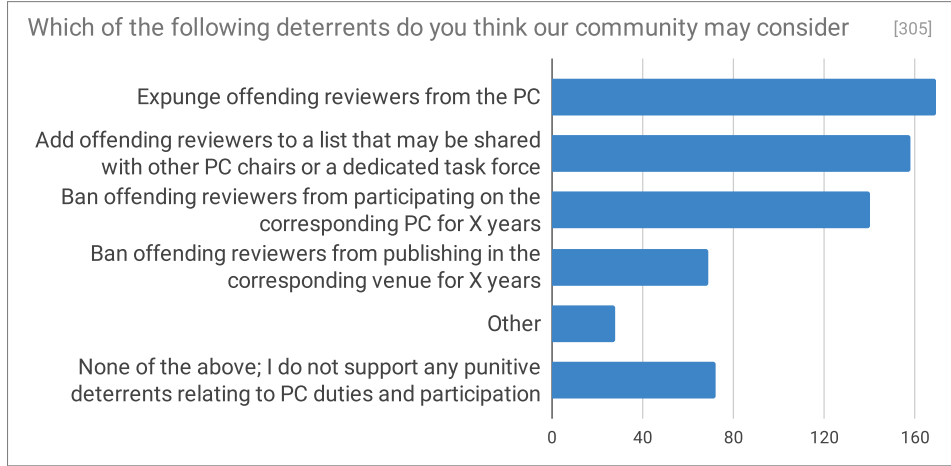
Figure 3: Participant support appears to correlate with the measure's severity. The majority support some punitive deterrent for neglecting PC responsibilities, but 24% of respondents oppose any penalties.
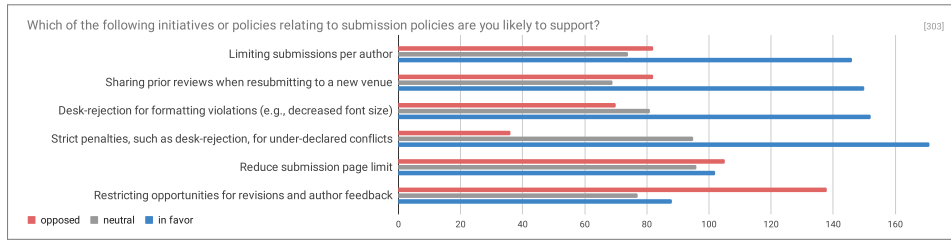

Figure 4: Respondents were against reducing opportunities for revisions and author feedback, and they were split on the idea of reducing submission page limits. All other proposals received majority support, with the strongest support indicated for strict penalties for under-declared conflicts.

in Figure 1. The vast majority of participants identified themselves as senior researchers (71%); about 16% of all respondents have served in the role of PC chair, and about 36% have served in the role of Associate Editor or meta-reviewer.

2.2 Review Processes

In the subsequent section, the survey asked participants to indicate whether they support or oppose possible policies relating to peer-reviewing practices. We included 8 policy suggestions organized in a Matrix table with a Likert scale (opposed, neutral, in favor). To get additional context on each
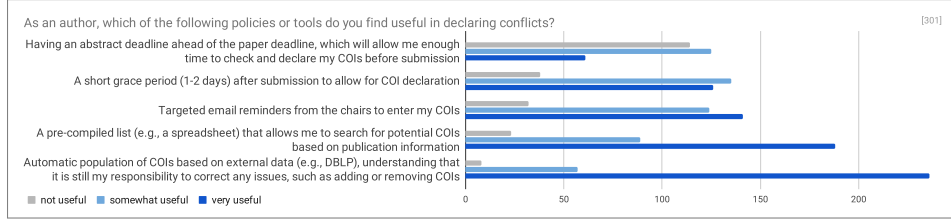
Figure 5: Respondents showed a clear preference for automated methods for COI entry.
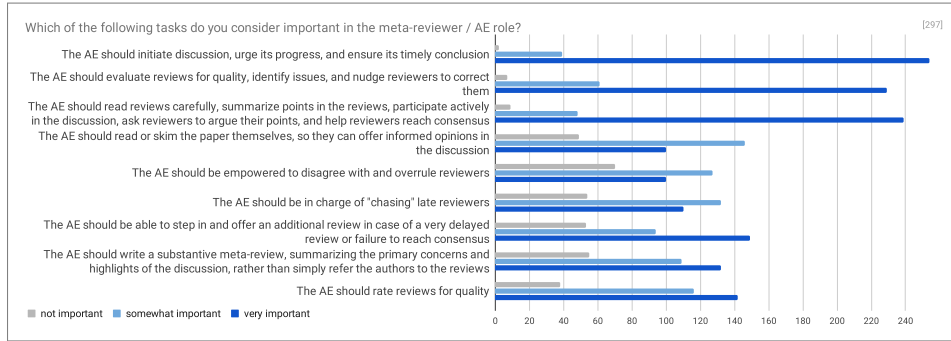

Figure 6: A significant majority of participants consider all of the above AE expectations somewhat or very important.

proposed initiative, including likely benefits and possible downsides, we instructed the participants to hover over the information icon ⓘ. We supply the summary information for each policy proposal in Figure 9.

A total of 305 participants responded to this question. We show the aggregated responses in Figure 2. We observe that the community is particularly supportive of amplifying the recognition of good reviewers, but it is more split with respect to punishment for poor reviewing performance (though the majority does support such measures). There is also clear support for pacing reviewing deadlines. Some measures that met strong opposition are de-anonymization of reviews, adding submitting authors to the reviewing pool, and reducing the number of reviews per paper.

Our survey dove deeper into the topic of punitive deterrents with the question "Which of the following deterrents do you think our community may consider implementing to avert problematic behaviors (e.g., late and/or low-quality reviews, unresponsive reviewers)?" This question also received 305 responses, and participant support seems to correlate with the measure's severity: 55% of participants support expunging reviewers from the PC,

51% believe that PC chairs or a dedicated task force should maintain and share lists of problematic reviewers, 46% support banning such reviewers from participating in PCs for a number of years, and only 23% supports banning such reviewers from publishing in the corresponding venue. About 24% of respondents oppose punitive deterrents relating to PC duties and participation. All these results are summarized in Figure 3.

This question also included an option to propose "other" deterrents. A total of 28 respondents entered suggestions for this option. Several emphasized making issues public, but many used this field to highlight nuances in how we judge reviewing performance and when response should be escalated, caution on the sensitivity of maintaining damning information, and suggestions to prioritize training, feedback, and open communication.

2.3   Submission Processes

Our questions on policies and initiatives relating to submission processes were also organized in a Matrix table with the same Likert scale (opposed, neutral, in favor). Again, participants could access additional information for each initiative by hovering over the information icon ⓘ (more details in Figure 9).

A total of 303 participants responded to this question (Figure 4). Respondents were against reducing opportunities for revisions and author feedback, and they were split on the idea of reducing submission page limits. All other proposals received majority support, with the strongest support indicated for strict penalties for under-declared conflicts.

On the topic of aiding conflict declaration, we organized options in a Matrix table with the Likert scale: not useful, somewhat useful, very useful. Participants indicated a strong preference for automated COI entry (Figure 5). Systems like CLOSET [1] can provide some support for this function, but challenges with false positives and entity resolution issues remain. Ultimately, some COI information is not in the public domain, but the community's clear desire for such support perhaps indicates that we should consider possible initiatives in this direction. Out of the 301 respondents, only 61 considered an abstract deadline a very useful buffer for taking care of their COI entry, whereas having a short grace period after the regular deadline was more popular (42% consider it very useful and 45% somewhat useful).
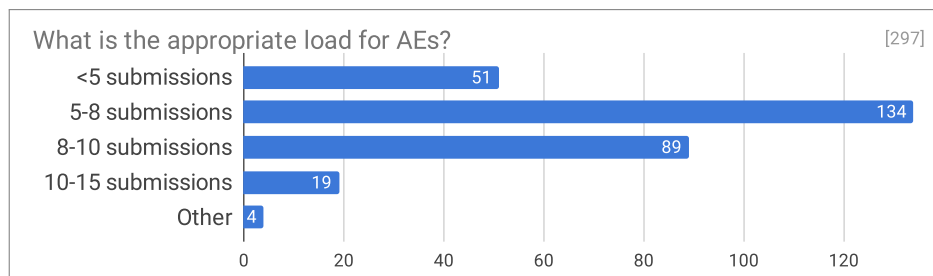
What is the appropriate load for AEs? [297]

<5 submissions	51
5-8 submissions	134
8-10 submissions	89
10-15 submissions	19
Other	4

Figure 7: Participants were asked to suggest an appropriate AE load in the context of a single submission cycle with about 200 submissions.

2.4 AE Expectations

With the growth of our research community, many of our PCs have grown larger to handle the increasing number of submissions. This has led to a hierarchical approach in PC organization, with a small set of PC members acting in the role of Area Chairs, Associate Editors, or meta-reviewers—for brevity, we will refer to all such members as AEs from here on. Frequently, AEs do not review papers directly but are responsible for handling a set of submissions, coordinating discussions, identifying issues with the reviews and taking appropriate action, etc.

With a large number of submissions, PC-chairs are often unable to keep a close eye on reviews and discussions of all submissions, so the function of AEs is critical. However, we observe significant variability in AEs' involvement and submission handling, despite PC-chairs often sharing expectations through guideline documents. We wanted to better understand, through the survey, our community's expectations of the AE role. We posed to participants the question "Which of the following tasks do you consider important in the expectations for this role?" We organized AE actions in a Matrix table with the Likert scale: not important, somewhat important, very important. Figure 6 shows the aggregate responses of 297 participants.

Based on the results, the most important functions of AEs include initiating and ensuring the progress of discussions, evaluating reviews for quality and asking for corrections, reading the reviews carefully and actively participating in the discussion themselves, urging the reviewers to support their positions with reasoned arguments. We note, however, that all actions are recognized by the majority of participants (76% or more) as somewhat or very important. The item that received the least support, with 24% of participants noting it as not important, was empowering the AEs to disagree with and overrule reviewers. However, we should highlight that even in this case, the overwhelming majority (76%) recognized it as somewhat or very
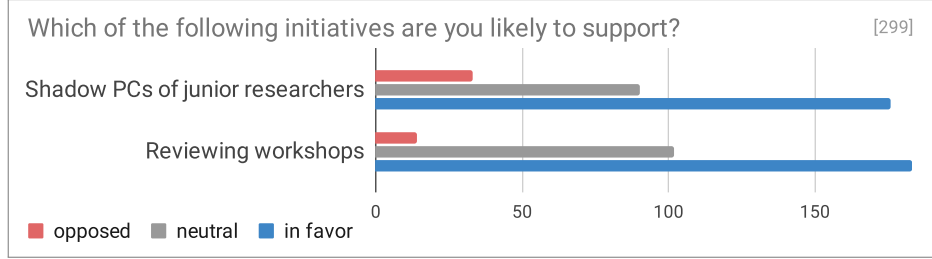
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Figure 8: Most participants support these particular initiatives for fostering a more positive reviewing culture, but there is some non-negligible opposition.

important.

In the context of AE responsibilities, we asked our survey participants to indicate the number of papers that they consider a reasonable load for this role. We recognize that this expectation can be affected by how this load is distributed throughout the year. To alleviate this ambiguity, we asked participants to consider a single submission cycle with about 200 submissions in total, when most reviewers are assigned 3–4 papers to review. (To help the reader put this in context, this is close to the number of submissions typically received in the July cycle of SIGMOD). Out of the 297 participants who answered this question, 45% recommend a load of 5–8 submissions, and 30% recommend a load of 8–10 submissions (Figure 7).

2.5 Fostering Better Culture

We often observe that good and reliable reviewers do a consistently good job, regardless of incentives. Ideally, we want our community to have an established culture of conscientious reviewing. However, PhD students are not consistently trained to be good and conscientious reviewers.[1] Our conferences can establish efforts that support such training, that both hone the reviewing skills of participating researchers and promote good reviewing practices as something valued in our community.

We proposed two potential initiatives that our organizing committees could undertake, and we asked participants' opinions on whether they were likely to support them. The Likert scale we used was: opposed, neutral, in favor. We describe the information we gave to participants about these initiatives below:

Shadow PCs of junior researchers. Junior researchers are added to a shadow PC, and are assigned to papers similar to the regular PC. They can remain anonymous to the AE and to other reviewers. Their reviews are assessed for quality by the AE, and top shadow reviewers are recognized with awards. High-quality shadow reviews can be made available to the authors.

Reviewing workshops. This can be an event collocated with our conferences, where junior researchers are exposed to good and bad reviewing practices through anonymized example reviews. They take a stab at reviewing a mock submission, and senior researchers help them work on their reviews. Successful completion of the workshop earns participants a certificate, which may help them get on PCs sooner.

We received responses from 299 participants, the majority of whom were in favor of both proposals (Figure 8). However, there is some non-negligible opposition as well (about 11% for the shadow PC). A subsequent free-form question in our survey provided some clarity to this stance, as some participants suggested that assigning junior people to the shadow PC may devalue their abilities and contributions, and they would rather allow people to jump into the regular PC directly. We believe that it is meaningful to consider these concerns and adjust and clarify the proposals accordingly. For example, the primary target of the shadow PC may be somewhat junior graduate students who want to gain experience in reviewing but who would not be

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[1]We fully recognize that we can find many bad reviewers amongst senior researchers as well. However, on the topic of fostering a culture of conscientious reviewing, it is more practical to reach out to our more junior members.

normally invited to regular program committees at this early stage of their careers.

2.6 General Feedback

Our survey concluded with a free-form textbox, where participants were invited to share further thoughts. We were delighted with the engagement of our community on this topic. We received 150 responses in the suggestions textbox, totaling more than 16K words. Many responses thanked the task force for the initiative, and the vast majority shared thoughts on the challenges and provided interesting suggestions. We found many opposing views expressed in the feedback. For example, many participants urge more detail and clarity in the meta-reviews submitted by AEs, and others express opposition, arguing that meta-reviews sometimes increase confusion when concerns and requests do not match well with those of the reviewers. Another example of conflicting opinions relates to the opportunities for revisions and feedback; many participants urge the community to maintain these functions, and others argue that these efforts have little benefit and only add to the workload of reviewers and authors. We also saw a lot of input on reviewing incentives and penalties, and COI handling. There are also several novel suggestions on releasing reviews of accepted papers (anonymously), and suggestions for empowering reviewers to champion papers.

Given the extent of the feedback we received in this part of the survey, we intend to summarize and discuss more thoroughly these suggestions in a separate report. Our task force is working on producing a list of possible initiatives, with discussion of the potential benefits, drawbacks, and challenges in implementing each one. We will work to incorporate the community feedback into this list of suggestions, and we will consider ways of releasing some more detailed comments, as long we do not compromise participants' anonymity.

3 Summary and Outlook

We are very happy with the community engagement with the survey, and we found many of the suggestions inspiring. Specifically, the survey has helped us better understand intricacies of these challenges that we had not appreciated earlier, and gave us inspiration for exploring more ideas. Our task force will work on making progress towards specific and more thoroughly analyzed proposals that we will share in a subsequent report. In the meantime, we invite anyone to contact the task force chairs with any thoughts or

requests.

References

[1] Sourav S. Bhowmick. CLOSET: Data-driven COI detection and management in peer-review venues. *Commun. ACM*, 66(7):70–71, jun 2023.

[2] Nachum Dershowitz and Rakesh M. Verma. Rebutting rebuttals. *Commun. ACM*, 66(9):35–41, aug 2023.

[3] Michael L. Littman. Collusion rings threaten the integrity of computer science research. *Commun. ACM*, 64(6):43–44, may 2021.

Requiring submitting authors to serve as reviewers. Every submitting author will be added to the pool of reviewers and should contribute to the peer review process.

Pros: + Increases the pool of reviewers significantly, resulting in reduced load all around.

Cons: – Hard to vet reviewing strengths and expertise of authors, potentially hurting review quality.
– Can make us more prone to unethical behaviors.
– Will make conflict declaration harder, as authors would now have to declare conflicts with all other authors (not just with the PC).

Punitive deterrents for not meeting reviewing expectations. Reviewers who do not meet expectations (e.g., are late in submitting reviews, do not engage in discussions) may be added to blacklists that are shared with other PC chairs or are banned from participating in PCs for some time.

Pros: + May improve review quality and timeliness.

Cons: – Effects of quality are unclear. We would likely need some ground work to establish effective incentives or deterrents.
– Punitive deterrents may disincentivize people from signing on to PCs.

Amplify recognition of good reviewers. Currently, good reviewers are recognized with awards. Perhaps we should amplify these incentives, with more significant recognitions awarded for consistent reviewing contributions across venues, over a period of time. Alternatively, consider financial incentives, e.g., reduced registration for PC members who perform their duties diligently.

Pros: + May improve review quality and timeliness.

Cons: – It is unclear if conference budgets can afford financial incentives.
– It is unclear whether existing reviewer awards have had much impact in reviewing quality.

Reduce the number of reviews per paper. Assign papers to 2 reviewers at first. Papers with 2 rejects are rejected. Papers with at least one borderline or positive review get one more reviewer assigned.

Pros: + Reduces the number of papers that get 3 reviews, thus reducing the load per reviewer.

Cons: – Might reduce acceptance rates

Restricting reviewers from participating in multiple PCs in a given year. There is currently no formal coordination across our venues. The same people may be invited to several committees, resulting in unmanageable reviewing load. Junior members of the community may be more prone to overcommitting.

Pros: + Will reduce reviewer load across our venues, hopefully translating to improved review quality and engagement.

Cons: – May be hard to implement in practice, as it requires coordination across venues.
– If the effort is simply reduced to a recommendation included in the invitation letter, it is unlikely to be heeded.

Pacing reviewing deadlines. Follow the example of conferences in other areas (like Software Engineering), where there are two different deadlines for the reviews. Half (or $\frac{1}{3}$) of the reviews must be delivered on the first deadline, and the rest can be delivered on the second deadline. Usually the first deadline is defined in the middle of the review period.

Pros: + Allows PC chairs to identify early PC members that will potentially deliver reviews late, and act sooner.

De-anonymizing reviews. Move our review processes towards an open science paradigm, where reviews are eponymous and public (e.g., through a system like OpenReview).

Pros: + More accountability in reviewing.
+ Public reviews would incentivize reviewers to do a conscientious job.
+ May shield from bad actors, and may make investigation of ethics issues easier.

Cons: – Possibly harmful to diversity and to junior researchers, who may be concerned to engage in public criticisms.
– Fear of possible retaliation

Increase the number of reviews per paper. By assigning a submission to more than the standard 3 reviewers, we are more likely to get enough reviews on time, and tolerate occasional low-quality reviews.

Pros: + Reduces the stress of chasing late reviewers
+ More likely to get sufficient expert and high quality reviews

Cons: – It increases overall reviewer load

Limiting submissions per author. Our conferences could limit the total number of submissions by each author during the span of a year or of a reviewing cycle.

Pros:
+ May reduce load by restricting the number of submissions.
+ May curb "paper mills" and low-novelty submissions that clog our systems.

Cons: Hard to determine the proper cutoff.

Sharing prior reviews when resubmitting to a new venue. Rejected papers from one venue may get resubmitted to another, sometimes with few or no changes. The submission may end up with the same reviewers who are disappointed to see their feedback having been ignored, likely leading to another rejection; this wastes reviewing cycles. Possible solution: Require authors to share previous reviews and explain how they addressed them.

Pros:
+ Encourages authors to implement changes and address reviewer comments even when the work is submitted elsewhere.
+ Makes more effective use of reviewing efforts.

Cons: Potential extra work for authors.

Restricting opportunities for revisions and author feedback. The combination of multiple deadlines per year, author feedback phase, and revisions, have resulted in constant reviewing work for PCs.Very few of our papers get direct acceptances. With most submissions going through revision, we impose more work on authors and reviewers. What if we do away with some established policies, such as author feedback or revision cycles? Or, as a middle ground, narrow the criteria for revisions.

Pros:
+ Reduces reviewing load.
+ Reduces author load with more papers getting direct accepts.

Cons: May reduce overall acceptance rates.

Strict penalties, such as desk-rejection, for under-declared conflicts. Despite efforts to improve accountability in conflict declaration, such as grace periods for COI entry, targeted reminders to authors, etc., many authors continue to neglect this critical task. Should we impose stricter penalties for such omissions?

Reduce submission page limit. Shorter papers would take less time to review, thus reducing reviewer load. May require a shift in expectations for contributions.

Figure 9: Additional information on reviewing (top) and submission (bottom) policy proposals that participants were asked to evaluate; they could access this information by hovering over the information icon ⓘ next to each option.