Workshop #6: **Peer Review.**

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Peer review is what it sounds like.

The evaluation of scholarly work by other scholars.

It is a community service used by all.

We use it to improve, debug, evaluate, and sort.

Peer review is also done by humans.

As such, it inherits human flaws like bias, hanger, snark.

Today: when, how to, and how to not.

An introduction to peer review.

1. Why and when do we review?
2. A paper's journey from sub. to pub.
3. How to write useful and fair reviews.

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First, why do we do peer review?

Fundamentally, peer review is a **community service**.

In good use cases, we can…
  1. improve each other's work via anonymous feedback.
  2. prevent mistakes from getting into the published record.
  3. sort work by quality and audience.

Second, when do we do peer review?

We peer review when we submit **papers for publication** in journals or conferences, but also when we submit **grant proposals** or abstracts for **talks** or **posters**.

Peer review is therefore used to sort submissions into those that are deemed acceptable and those that aren't.

This doesn't imply that all peer reviewed work is correct!

Third, norms vary by [sub]field.

Broadly, **natural sciences** use **single-blind review**.
The authors are *blinded* from seeing who the reviewers are.

Most **other fields** use **double-blind review**.
The reviewers are blinded from seeing who the authors are.

Norms are also changing. Some journals allow reviewers to publicly sign their reviews. Others publish peer reviews along with the paper. Some are unblinded entirely!
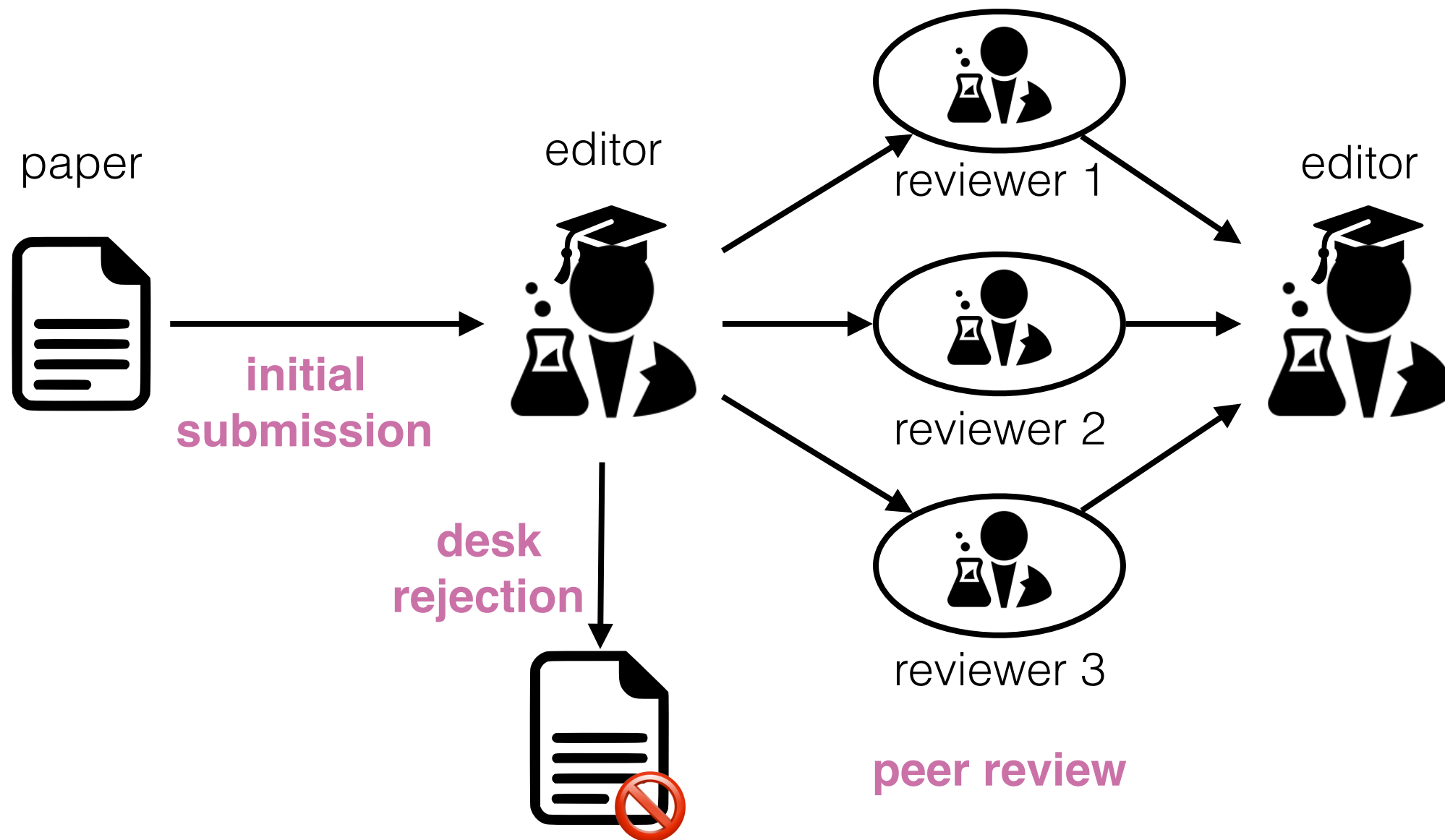
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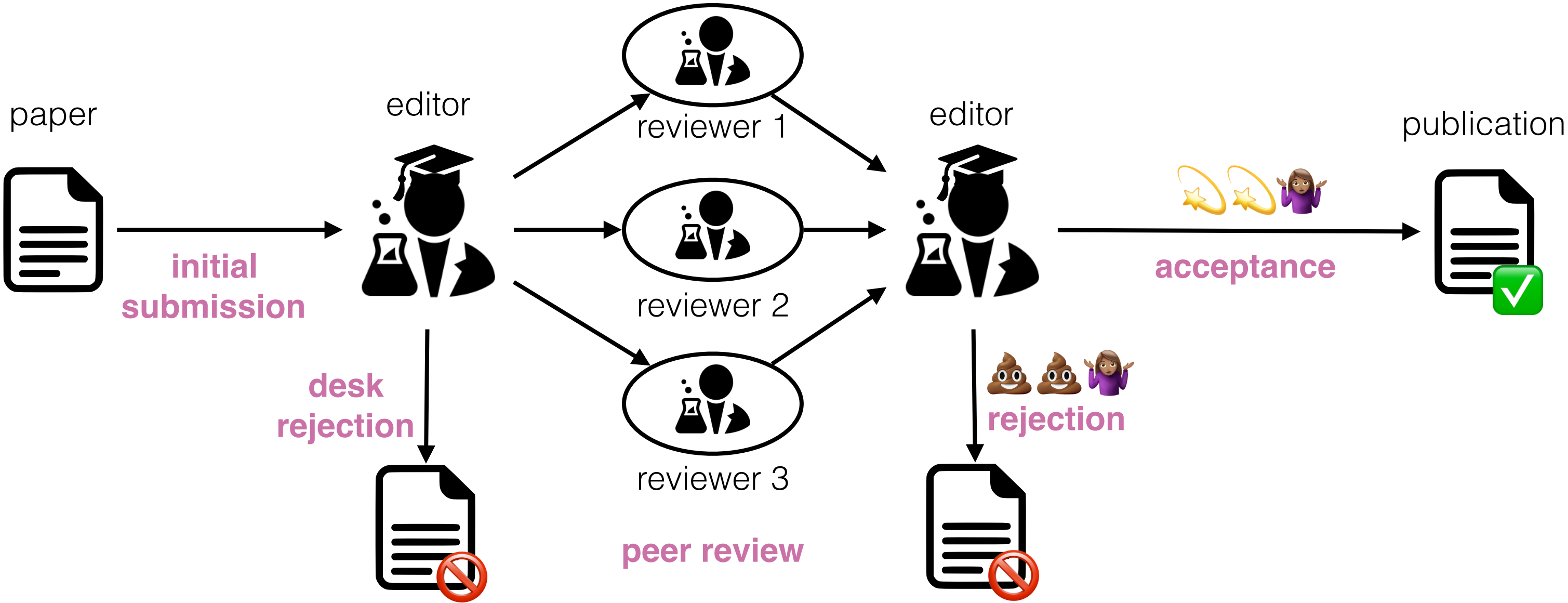
The journal peer review process.

paper

editor

initial submission

desk rejection
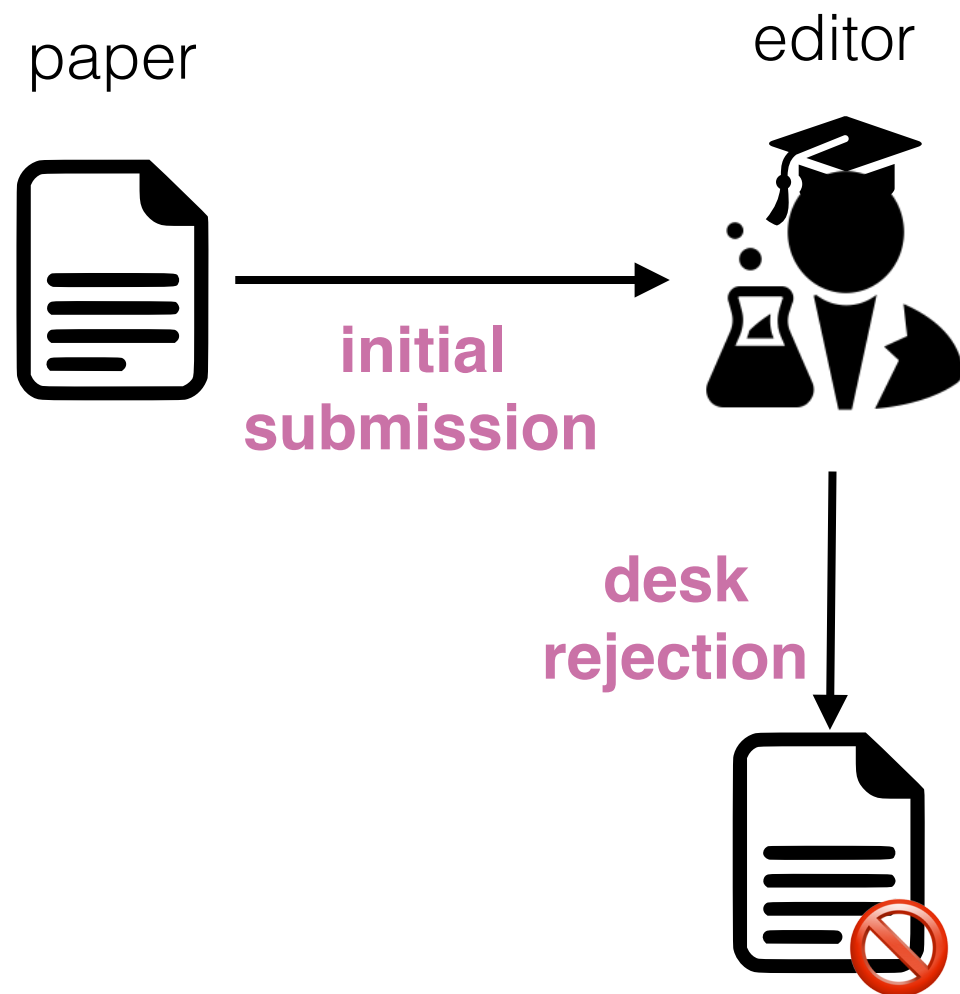
Note: The journal peer review process is *asynchronous,* and proceeds independently for each paper.

The journal peer review process.

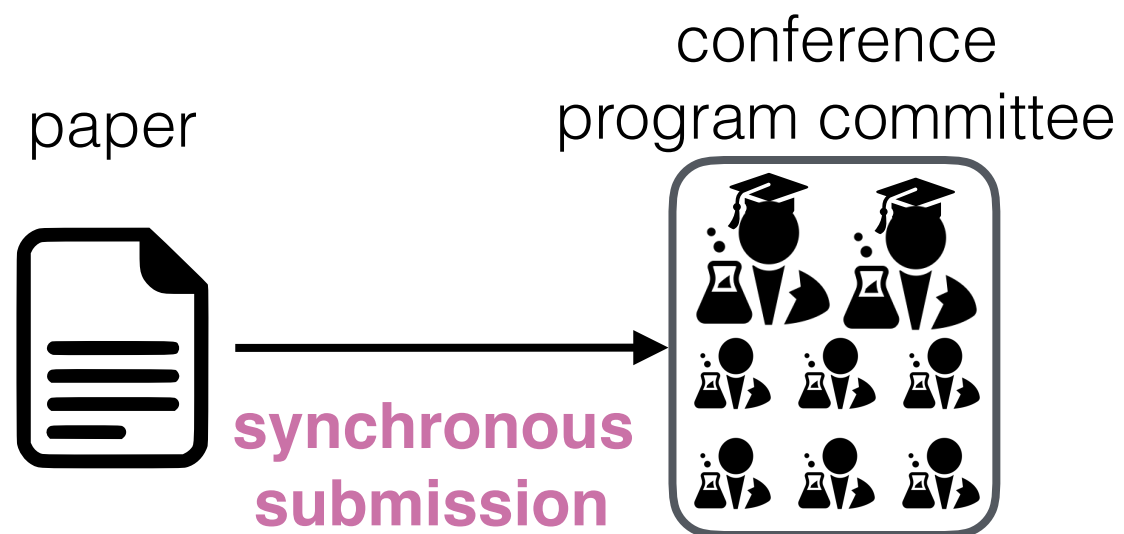# The journal peer review process.

paper → editor → reviewer 1, reviewer 2, reviewer 3 → editor → publication

initial submission

desk rejection 🚫

peer review

acceptance ✅

rejection 💩💩🤷🏽‍♀️ 🚫

The journal peer review process.

The conference peer review process.

paper

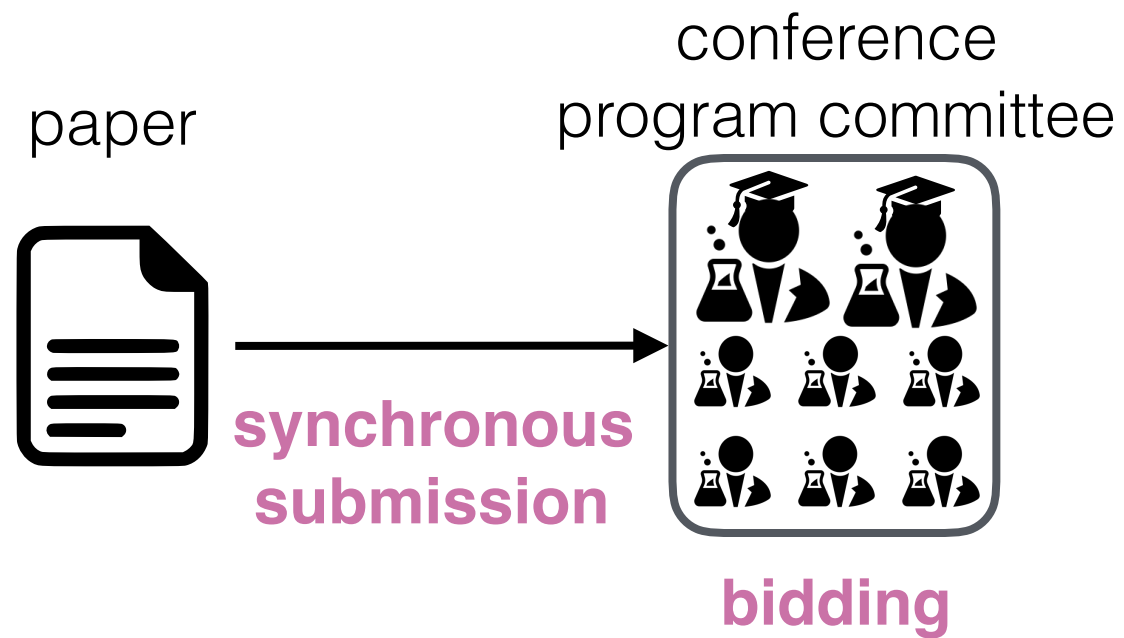conference
program committee
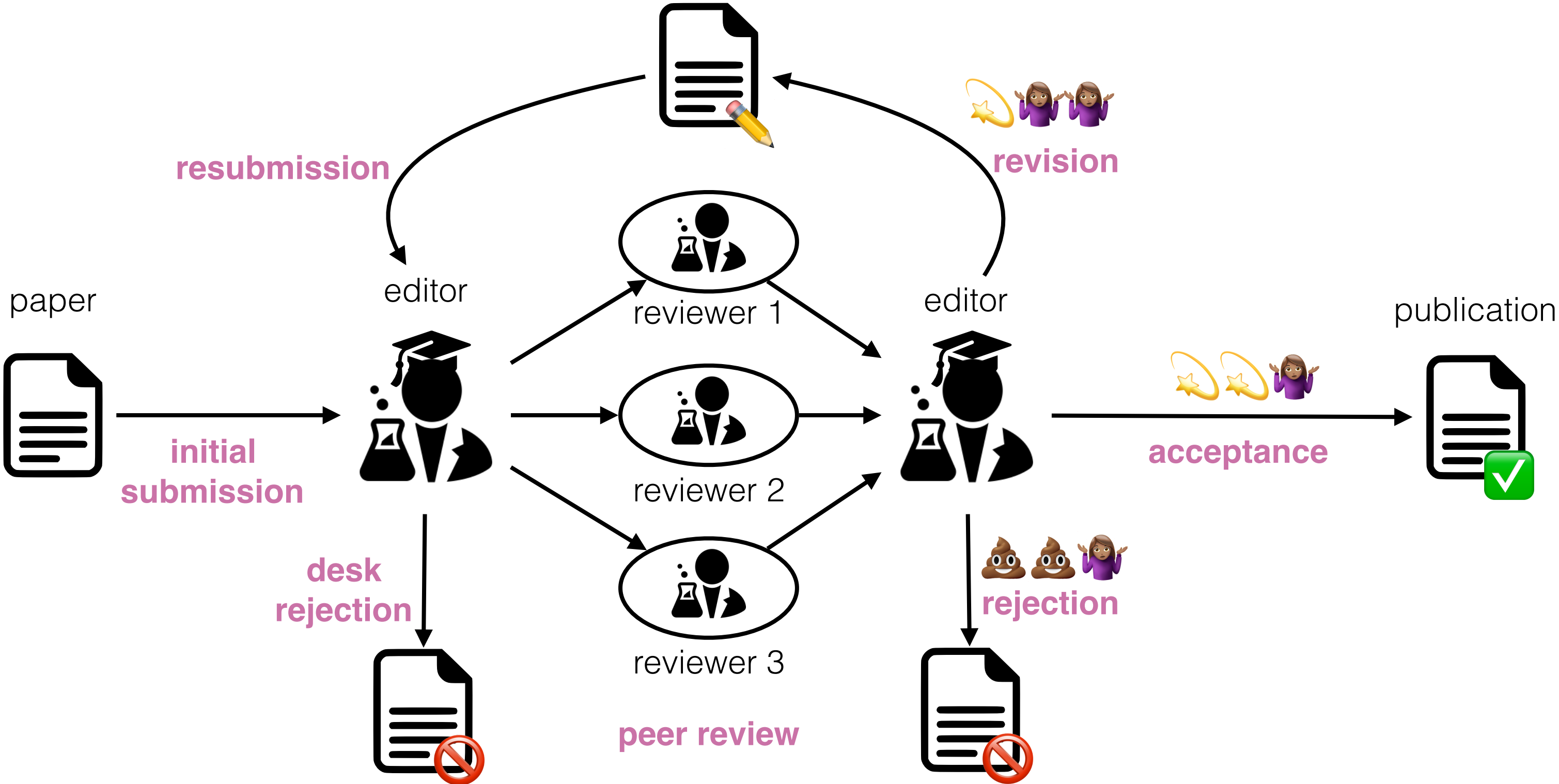
**synchronous
submission**

Note: The conference peer review process is *synchronous,* which means that everyone submits their papers all at once—typically right before the deadline!

In what follows, each successive phase has its own deadlines. Conference peer review is therefore a highly coordinated and massively parallel operation!

This also means that the peer reviewers, who are collectively called the **program committee** (PC), are selected in advance, and will be expected to review multiple submissions at once.

The conference peer review process.

paper

conference
program committee

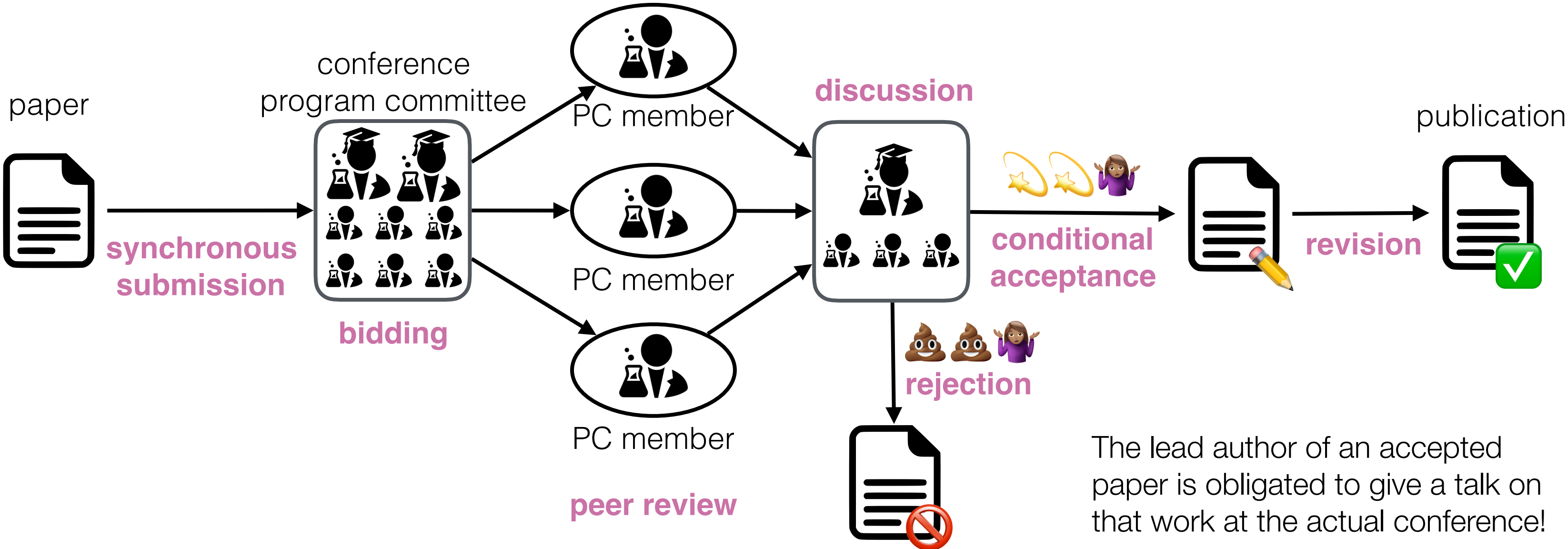

**synchronous
submission**

bidding

In the **bidding** phase, members of the PC go through all the submissions and bid on papers that they would like to (or would be willing to) review. Papers are then allocated to reviewers using Computers, supervised by the senior PC.

The conference peer review process.

paper

conference
program committee

PC member

PC member

PC member

discussion

**synchronous
submission**

bidding
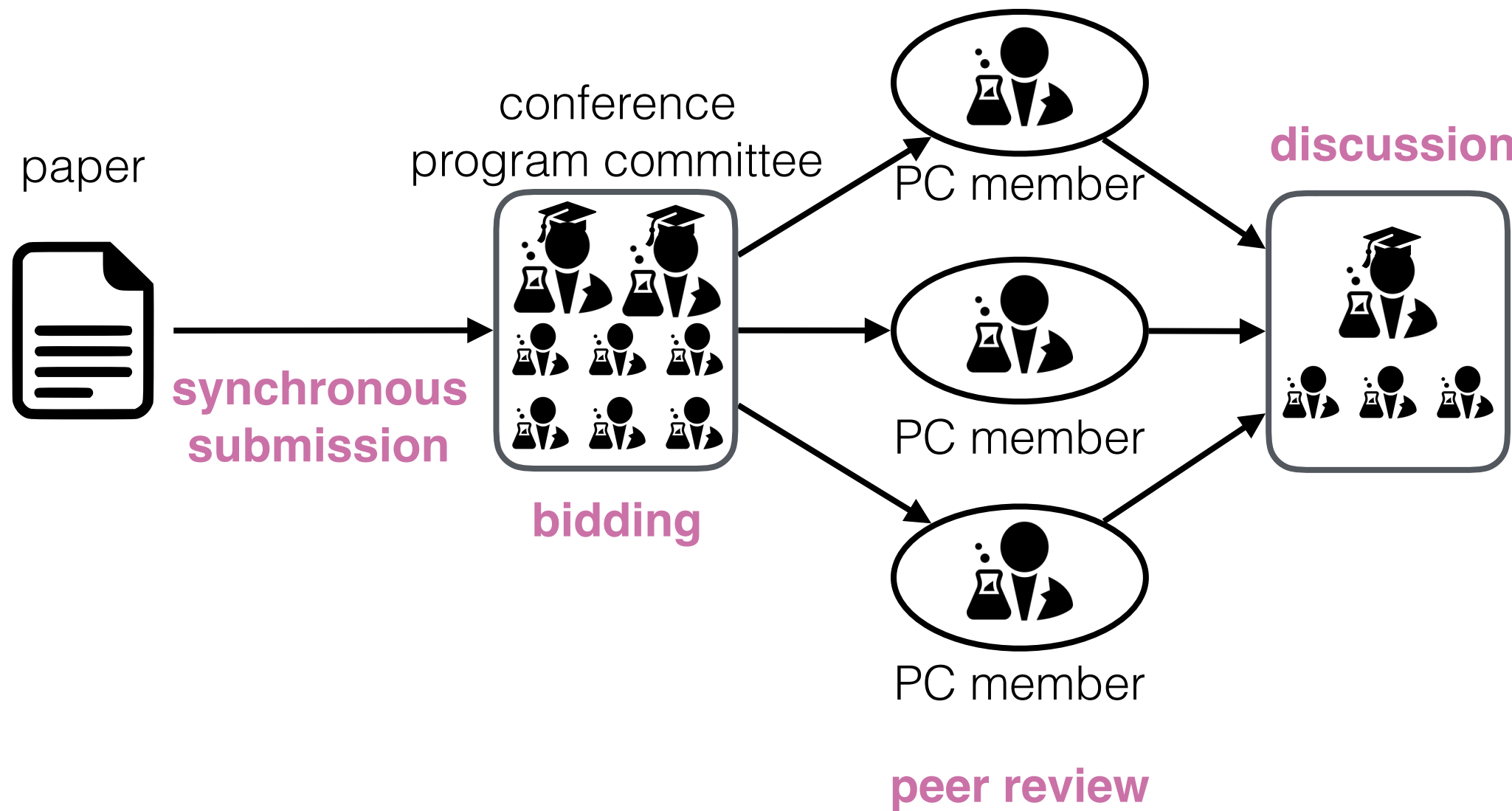
peer review

In the **discussion** phase, members of the PC pool their reviews. Decisions that are not clearly *accept* or *reject* are discussed as a group, under supervision of a Senior PC member.

The conference peer review process.

paper

conference
program committee

PC member

discussion

publication

**synchronous
submission**

PC member

**conditional
acceptance**

revision

bidding

PC member

rejection

peer review

The lead author of an accepted
paper is obligated to give a talk on
that work at the actual conference!

Other varieties exist

canonical conference
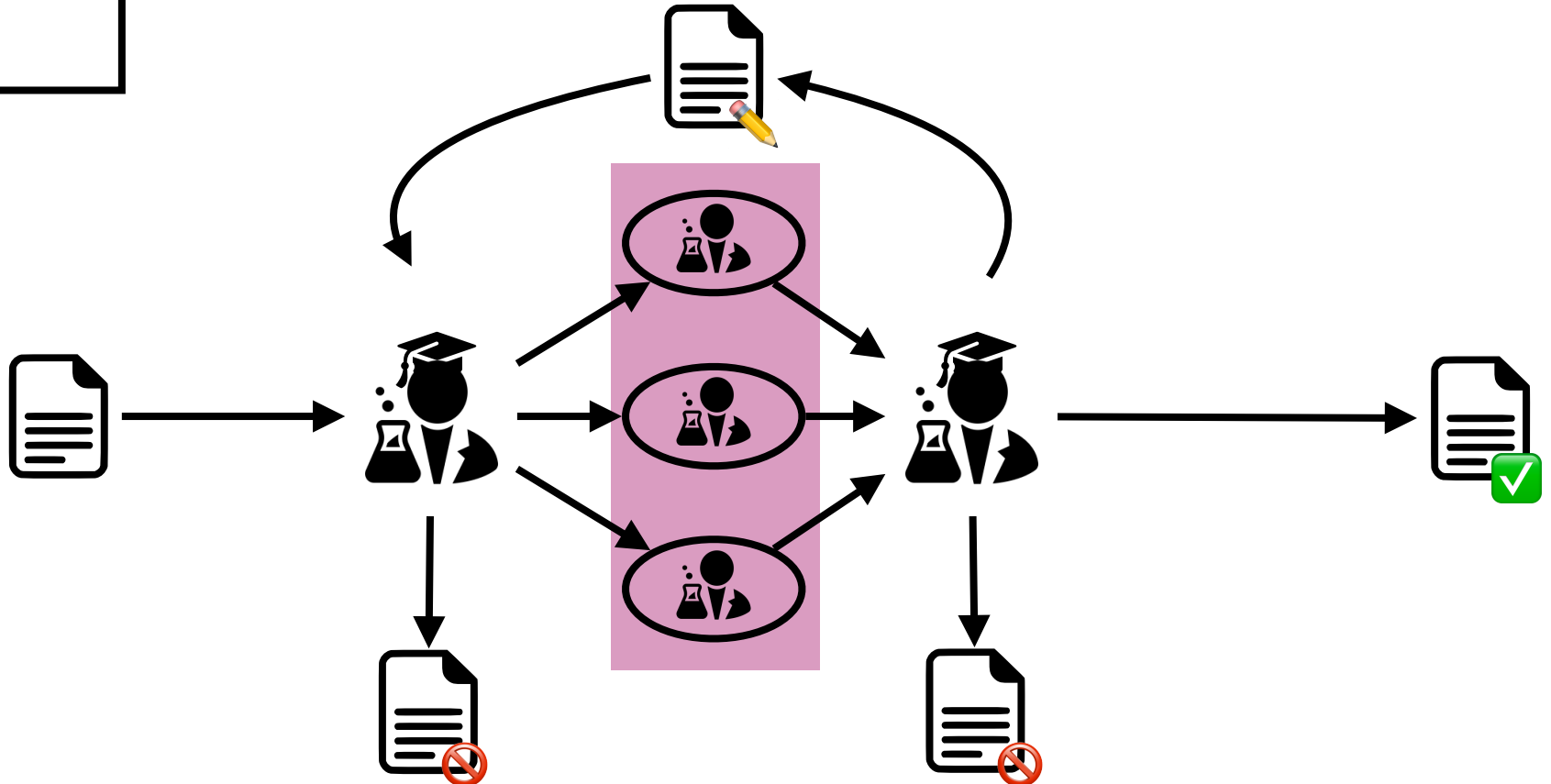peer review
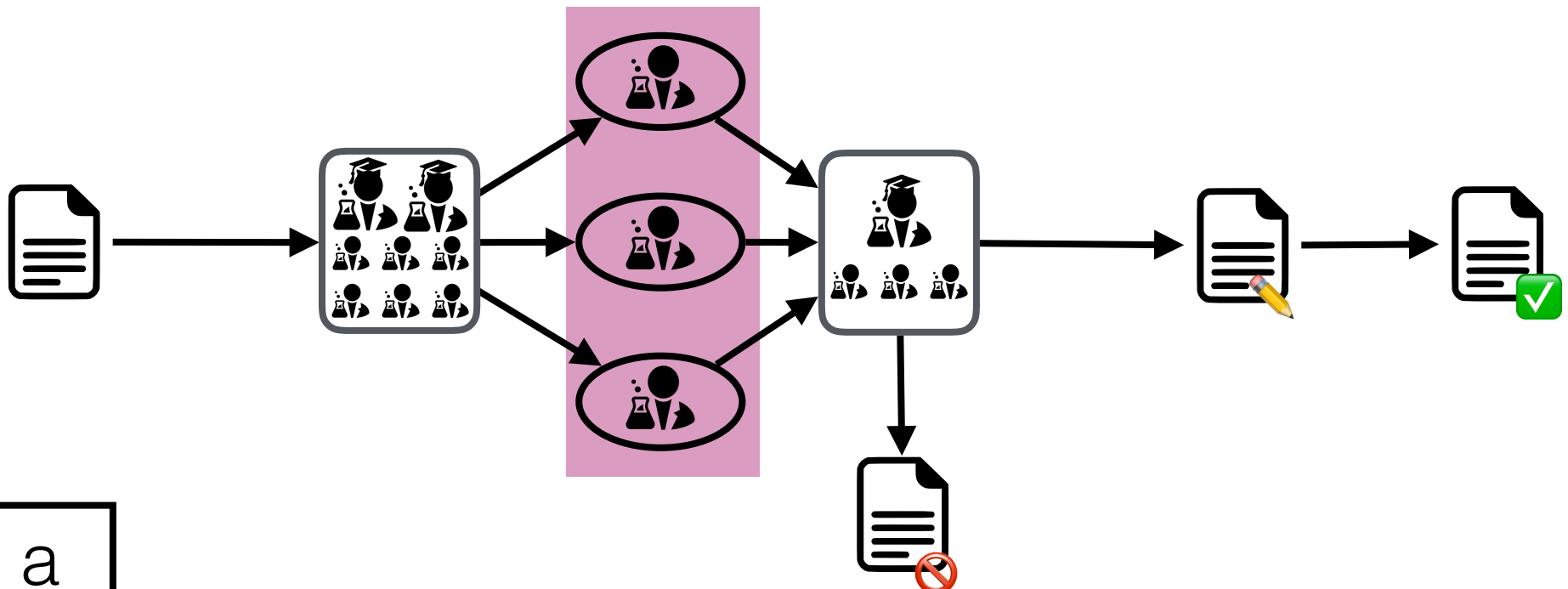
commonality: reviewers are a
gateway to publication

canonical journal
peer review

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Pre-review checklist

Philosophy: **golden rule.**
If *you* submitted a paper,
what kind of review would *you* want?

Fair
Unbiased
Constructive
Technically sound

Pre-review checklist

Have you had coffee? Is it before noon?
Do you have two hours? Are you hungry?

Golden Rule: you'd probably want your reviewer to have a
fresh mind, coffee, plenty of time, and no urgent hunger.

Pre-review checklist

Do you know [of] the authors?

If you know the authors: jot down your impressions of them, good or bad. Consider that these impressions may bias your results unless you acknowledge this potential bias right now.

If you think you will be unable to overcome preconceptions about the authors, write to the editor and explain that you cannot provide an unbiased (+ or -) review.

Pre-review checklist

What does this journal require in order to publish?
(e.g. sound results; data available; broadly interesting.)

This is usually provided to you by the journal.
You can always ask the editor!

Pre-review checklist

Are you grumpy or mad or stressed?

Golden Rule again: you'd probably want a review who's in a reasonable mood. With that in mind, it's worth thinking for a moment about attitude, and get (briefly) philosophical:

Reviewing a paper isn't just about finding its faults and teaching those authors a thing or two. It's also about finding its strengths, and learning from it. Try to stay balanced: skeptical when you examine their ideas, but also open to listening to them in the first place.

Pre-review checklist

Attitude.

You, the editor, and the authors are on the same team. Team Science. It's cheesy, but get idealistic here. You're part of the team that takes this piece of clay and spins it till it holds water.

Pre-review checklist

Google the authors. Have they already published this result?

Embarrassing, but sometimes this happens!
ArXiv or other preprint doesn't count.

Note that computer scientists sometimes publish a conference version of a paper and then expand it with corrections as a journal article. Not illegal. Definitely inflationary.

Pre-review checklist

Attitude.

Do you know [of] the authors?

Are you grumpy or mad or stressed?

What does this journal require in order to publish?

Google the authors. Have they already published this result?

Have you had coffee? Is it before noon? Do you have two hours? Are you hungry?

Anatomy of a Review in 5 parts

1. Summary of the paper in *your* words. 1 paragraph.

2. Summary of the main successes or main problems of the paper. 1-2+ paragraphs.

3. Clear and concise evaluation and recommendation.

4. Numbered list of the specific issues that would need to be fixed or addressed in order for the paper to be publishable.

5. Bulleted list of small corrections, typos, details, grammar, etc.

Write your review *to the editor* but your audience is really *the authors*.

Anatomy of a Review in 5 parts

1. Summary of the paper in *your* words. 1 paragraph.

A referee report should begin with a one paragraph summary of the paper (written in your own words, from your own perspective, not a paraphrasing of the paper's abstract), its main goals and its approach.

Anatomy of a Review in 5 parts

1. Summary of the paper in *your* words. 1 paragraph.

2. Summary of the main successes or main problems of the paper. 1-2+ paragraphs.

The report should have a paragraph briefly summarizing the main successes or the main problems (1-2 sentences each) of the paper.

Here you can say whether you think what the paper has done is novel, and whether it rises to the level of a scientific publication. If these require additional explanation, another 1-2 paragraphs to expand on the points are okay.

Anatomy of a Review in 5 parts

1. Summary of the paper in *your* words. 1 paragraph.

2. Summary of the main successes or main problems of the paper. 1-2+ paragraphs.

3. Clear, concise evaluation & recommendation, including: ⟶ **a**. Accept without revisions.
   b. Accept with minor revisions.
   c. Minor changes required.
   d. Major changes required.
   e. Reject.

When you make a recommendation about the paper, state clearly what you think should happen with the paper and why. It is annoying as an author and editor to get a review that doesn't come out and say it. Right after this statement, be sure to explain very briefly why, and promise "detail below."

Anatomy of a Review in 5 parts

1. Summary of the paper in *your* words. 1 paragraph.

2. Summary of the main successes or main problems of the paper. 1-2+ paragraphs.

3. Clear, concise evaluation & recommendation, including: ⟶

a. Accept without revisions.
b. Accept with minor revisions.
c. Minor changes required.
d. Major changes required.
e. Reject.

4. If **b**, **c**, or **d**, provide a numbered list of specific issues that would need to be addressed for the paper to be publishable.

Note on 4: Categorize changes as Major or Minor.

Major changes are changes that would cause a whole section (or the whole paper) to have to go back to the drawing board. Poor logic, mismatch between data and conclusions, or key results gone missing... these require major changes. Minor changes might be more local to a particular part of the paper, a particular plot, or a particular logical construction.

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5. Bulleted list of small corrections, typos, details, grammar, etc.

What if there are loads of typos?

We [typically] write papers in English, regardless of whether we grew up writing it or whether we learned it after a few decades. This gives native speakers an advantage and non-native speakers a disadvantage. Truthfully, *it's not fair*.

Sometimes you'll read a paper where language itself gets in the way of communication.
Sometimes, that's being too gentle, since the paper is a mess and you can't figure out what they are trying to say because the grammar is messy, imprecise, and jumbled.

My recommendation is to keep track of at most ~15 grammatical or spelling mistakes.
Include them in the "Trivial" section of your review, and if the language got in the way of your understanding, be honest about it. Be gentle, but be honest.

It's also ok to suggest to the authors or editor that the authors work with a native English speaker to improve the readability of the paper. Again, be on the same team as the authors: our goal is clear written communication.

How do we prepare the review?

Pretend like you're studying the paper as part of a project & take notes as you go.

Pretend like this is one of the papers for your own work that you really must understand deeply. What did they do, how did they do it, why did they do it, and what were the conclusions? I print the paper or read it on a tablet where I can mark it up!

Read the abstract and introduction. What's your initial reaction?

Write it and acknowledge it to avoid and understand your own confirmation bias. Sometimes an abstract or introduction may be confusing, overstated, self-aggrandizing, full of typos, or otherwise annoying. You should acknowledge this to yourself, and then ask whether there are *nevertheless* important results in the paper. As a reviewer, you can always ask the authors to tone down the rhetoric.

Try to understand what the authors are trying to do, even if they don't explain it well.

Golden Rule applies here, so help guide the authors to their (inferred) goal with your review. One thing to keep in mind is whether there are missed opportunities, where the authors could do something interesting but didn't. Is it an interesting research question, even if the answer wasn't satisfying?

Questions to help the process

Is notation consistent? Is notation defined?

Is it possible for you to rederive the important equations? Are they correct?
> Sometimes this is really hard, but almost always worth it. Sometimes this makes me (personally) feel dumb! I struggle for a bit, and only then ask for help. Remember that the point of peer review is to make the paper better, and if YOU can't understand it, chances are others might not be able to either.

Do the authors' claims follow from the evidence that they have provided?

Do you think the paper is honest?
> Why or why not?

Are there important references that aren't cited and discussed, but should be?

Does the paper fit within the scope of this venue?
> And, is it up to par, relative to what papers in this venue *should* be like?

Questions to help the process

Are the abstract, introduction, discussion, and conclusion harmonious? Are their claims valid, given the arguments of the paper?

Overselling? Underselling? Again, consider the Golden Rule. If a reviewer found a part of your paper that they thought was great, but you hadn't put it in the abstract, wouldn't you want to know?

Imagine you wanted to replicate this paper. Could you do it from what's written?

Related: some journals will have data availability policies while others will not.

Plots checklist

Do you understand the symbols, colors, where the data came from, annotations, etc?

If not, say so in your review. Plots are about communication! Same thing goes for small font sizes.

Are the axes scaled and labeled in an "honest" way?

Are there things on the plot that are unexplained?

Sometimes, authors will draw your attention to only one trend in a plot, but the plot *also* shows another trend. For example, maybe a timeseries shows a generally increasing trend, but there are 5 points on the far right that show a decrease. Do you get the sense that the authors understand this behavior or have accounted for it?

Is each plot cited in the body of the paper?

Pro Tips

Some journals compile a PDF that gives you the writing, then the figure captions, then the tables, then the figures, and then the references—or something awful like that. :/

Recommendation:
If you print, work at a large desk where you can easily see figures in context.
If you're on a screen, open a 2nd copy of the PDF and have the figures visible too.
Same thing goes for supplementary materials.

Bonus Tip, regarding 👆: when you submit your own papers, provide a "convenience PDF" for reviewers as a supplemental file where the damn figures are in the right spot.

Do the authors make claims of precedence?

To our knowledge, we are the first to X…
This is the largest study of its kind to date, using over N datapoints…

Ask for this crap to be removed. Claims of precedence are not only annoying and unnecessary, but they are hard to confirm, don't age well, and serve little purpose. [APS journals prohibit such statements.]

Optional: add questions at the end

If you're curious about something but it doesn't belong in the paper, ask a question at the end of your review!

Explicitly state that you do not require any changes made to the paper for this question. Perhaps, if it is interesting, they will include something anyway. This may have the effects of (a) opening a less judge/judged dialogue and (b) giving the authors an idea of what questions their paper may inspire.

Not recommended if your review is overall negative, and you are rejecting the paper.

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More from this series in PDF at http://danlarremore.com

Workshop #3: **Data Visualization.**

Workshop #4: **Giving a Talk.**

Workshop #5: **Clean Code.**

Workshop #6: **Peer Review.**

Q&A from audiences

Can you appeal a rejection?
For journal articles, yes. Editors decide, and appeals are typically denied.

After Revise & Resubmit (R&R) do you get the same reviewers?
Usually. Sometimes reviewers disappear, go on sabbatical, have children, and so on, so if your revision arrives after a long time, some or all the reviewers may differ.

Can/do people wink or nudge about their identity in a double-blind review?
Probably…but don't.

What is a typical R&R process time limit?
A month? But usually you can ask the editor for more time. Really depends on the field!

How many editors does a journal have? Are they paid?
They are paid, but usually not enough to call it a job. Most editors are doing service for their academic communities. This isn't always true, however. For instance, *Nature* family editors are non-academic, full time.

Q&A from audiences

When do you put your paper on the arXiv? Generally, what's up with preprints?
First, check out the wikipedia page *List of Academic Journals by Preprint Policy.*

Second, here are some questions to consider:
Is the review Double-Blind?
Will the paper probably generate interest from the press?
If the answer to either is yes, I do not post a preprint. Preprints may violate double blind review policies, and it's generally not a good idea to talk to the press about things that aren't peer reviewed.

Broadly, preprints are a great idea. You get free feedback on your work, and you get to read the freshest results and ideas. Some very cool work gets tied up in peer review for over a year, particularly when it's high profile, controversial, or in math or economics. The arXiv, SSRN, and other preprint servers are a great solution.

How do you know whether you're qualified to be a peer reviewer?
Ask your advisor if you're unsure. Team up with someone else on your first review to get your bearings.

Do some professors hide from reviewing duties?
Yep. We all think we're *very busy*! (We're usually right!) I try to maintain a balance: every time I submit a first or last author paper, it will require 3 reviewers, so I try to provide ~3 reviews for each such submission.