Understanding the Peer Review Process:
The Role of PREreview and Preprints

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PREREVIEW

1

Agenda

Introductions & Land Acknowledgement

What is peer review?

Understanding preprints

Power, privilege, and exclusion in academic publishing

Introduction to PREreview

How to Write Fair and Constructive Reviews

Discussion and Q&A

# Why is it important to share research?

The 5 W's of Sharing Research

- **Who** should share their research?
- **What** research should be shared?
  - Data, protocols, published papers, preprints
- **When** should researchers share their work?
- **Where** can research be shared?
  - Journals, preprint servers, conferences, online platforms
- **Why** should researchers share their work?
  - Transparency, advancing knowledge, fostering collaboration, increasing impact
- **How** can we share research effectively?

What are some challenges and considerations that exist around sharing research?

The research cycle
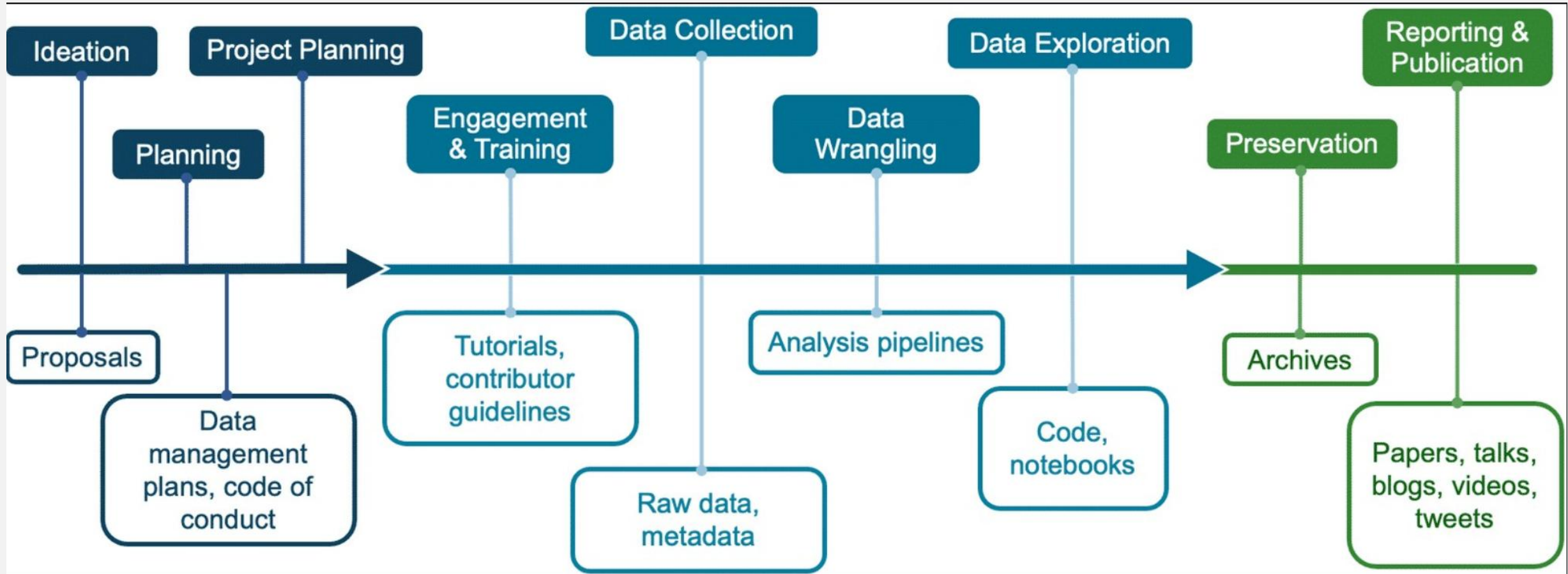
The research cycle

—

The traditional research cycle is not perfect...

- Often opaque, hiding decision-making and influences
- Tends to prioritizes Western knowledge, marginalizing diversity
- Unequal access and participation worldwide
- May reinforces hegemonies and a monoculture of knowledge
- Can perpetuates inequities in who contributes and benefits

What is a preprint?

Defining a preprint

—

A preprint is a scientific manuscript that is uploaded by the authors to a public server. The preprint contains data and methods, but has not yet undergone journal-organized peer review.
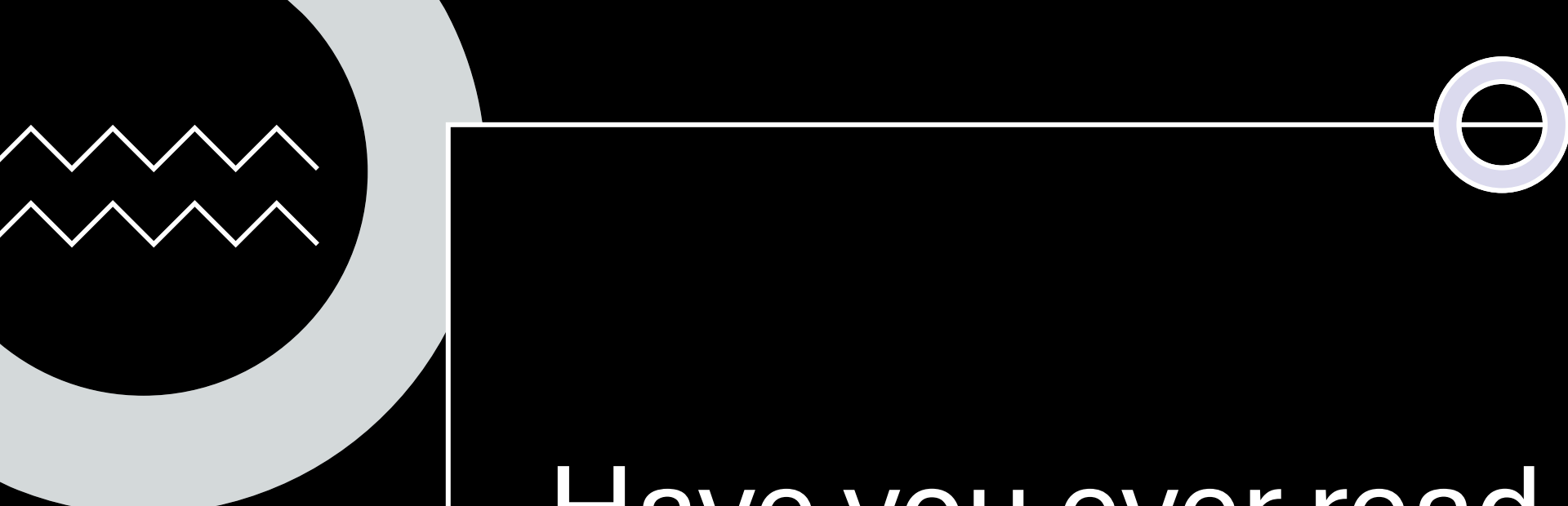
— Modified from ASAPbio Preprint FAQ section

Defining a preprint

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*A preprint is a **scientific manuscript** that is **uploaded** by the authors to a **public server**. The preprint contains **data and methods**, but has not yet undergone **journal-organized peer review**.*
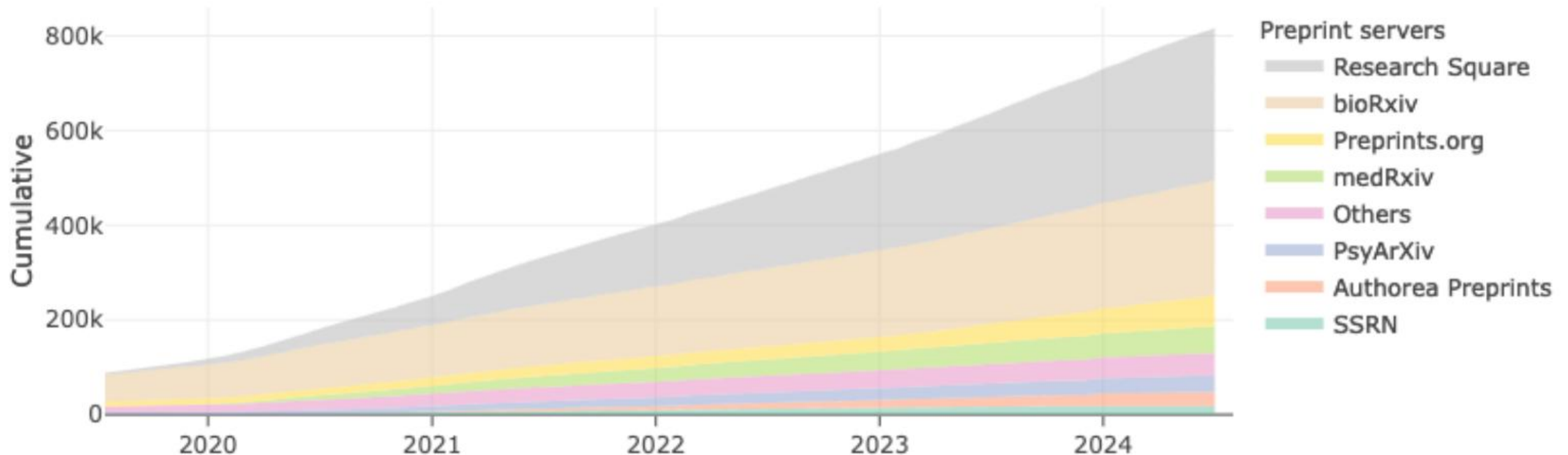
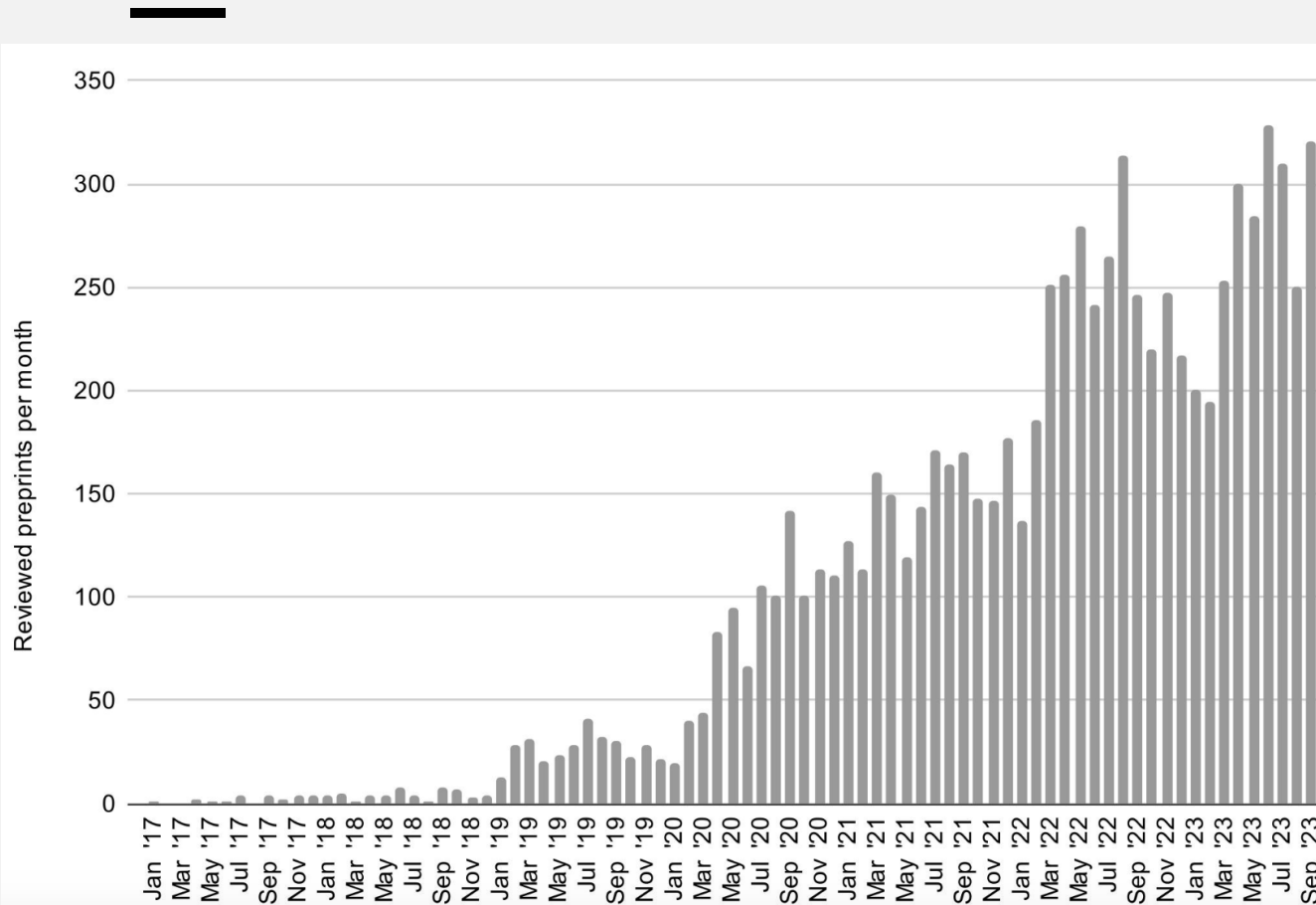— Modified from ASAPbio Preprint FAQ section

Have you ever read a preprint?

There number of preprints is growing

Preprints in Europe PMC
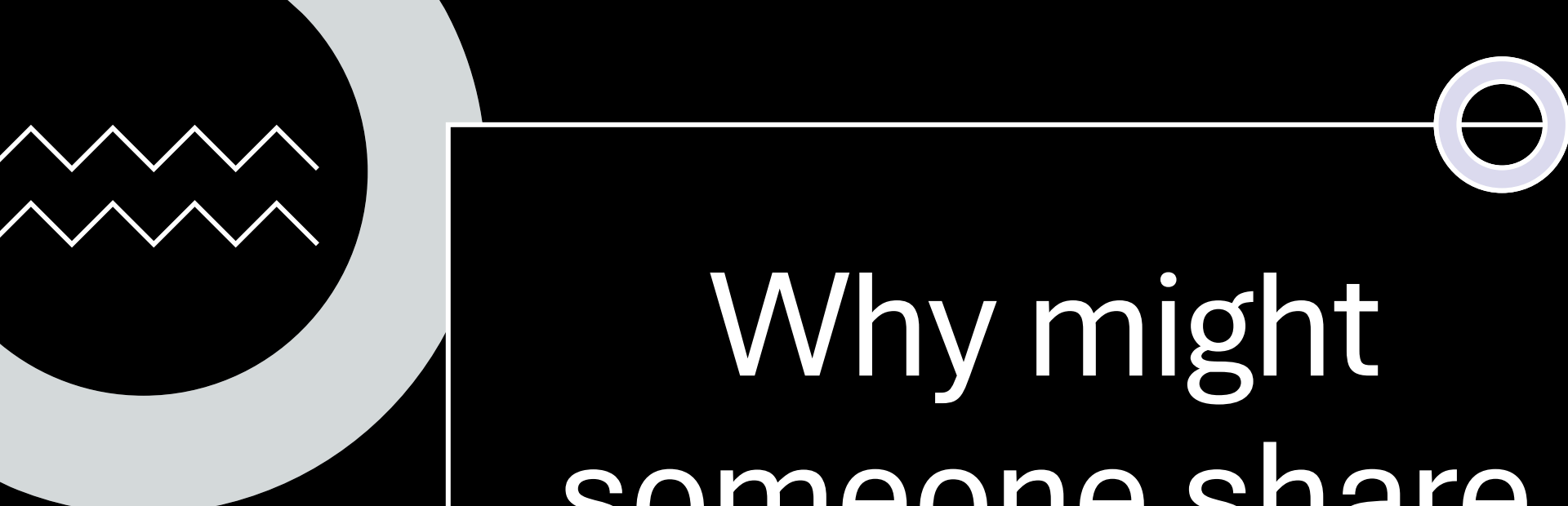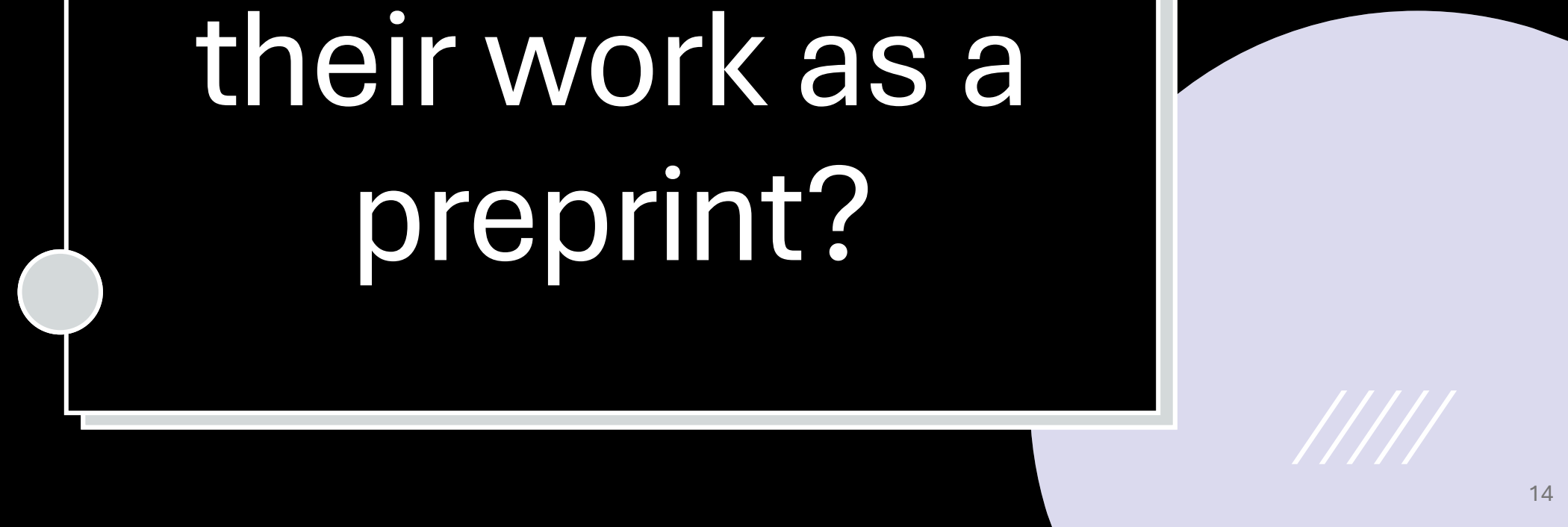
Preprint review adoption is growing too!

Avissar-Whiting M., *et al.* (2024) Recommendations for accelerating open preprint peer review to improve the culture of science.

PLoS Biol 22(2): e3002502.
https://doi.org/10.1371/journal.pbio.3002502

Why might someone share their work as a preprint?

Motivations for sharing preprints

Fig. 7. Motivations for posting work on bioRxiv. In a survey of bioRxiv users, scientists were asked why they post manuscripts on the server (see main text and Supplementary Data).

Modified from Richard Sever, Ted Roeder, Samantha Hindle, Linda Sussman, Kevin-John Black, Janet Argentine, Wayne Manos, John R. Inglis - 2019 bioRxiv 833400; doi: https://doi.org/10.1101/833400
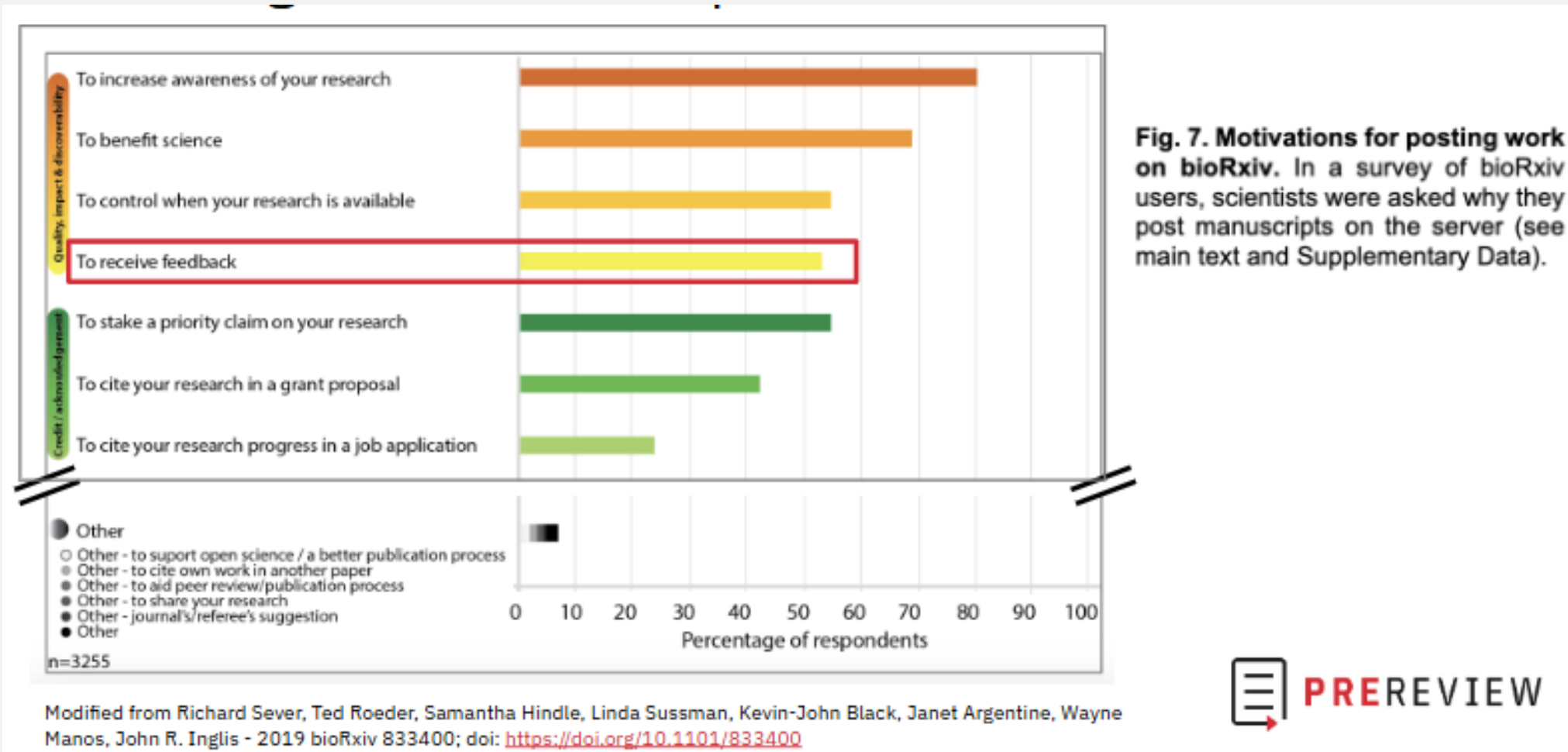
What is Peer Review?

Defining peer review

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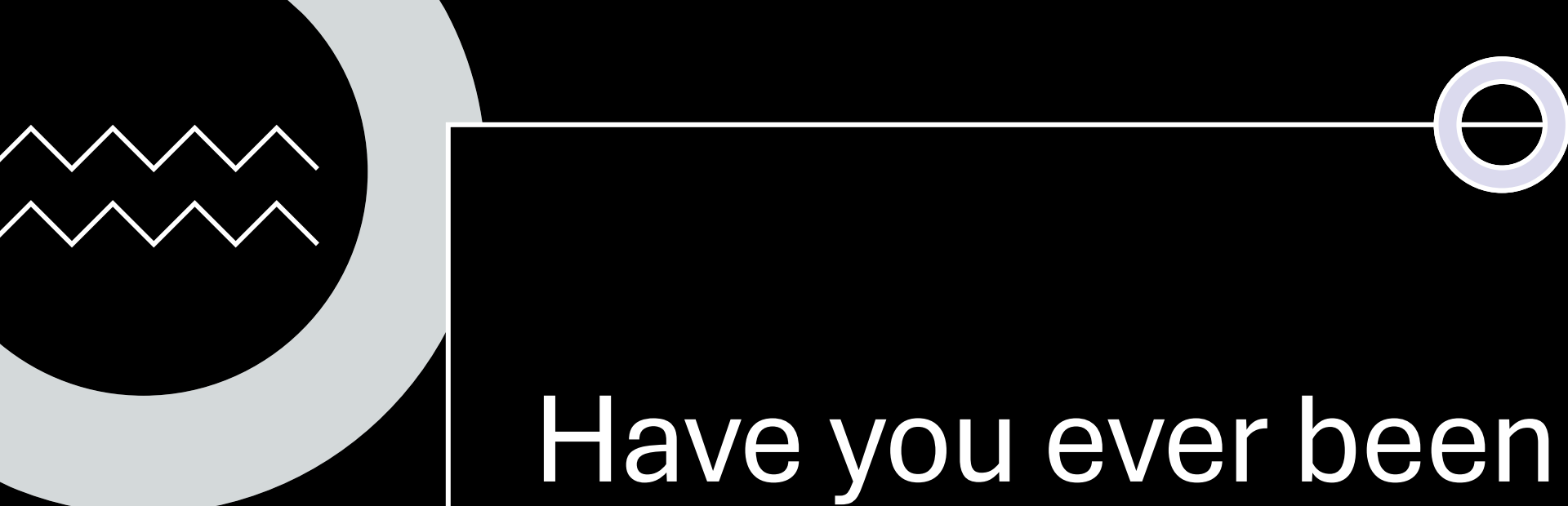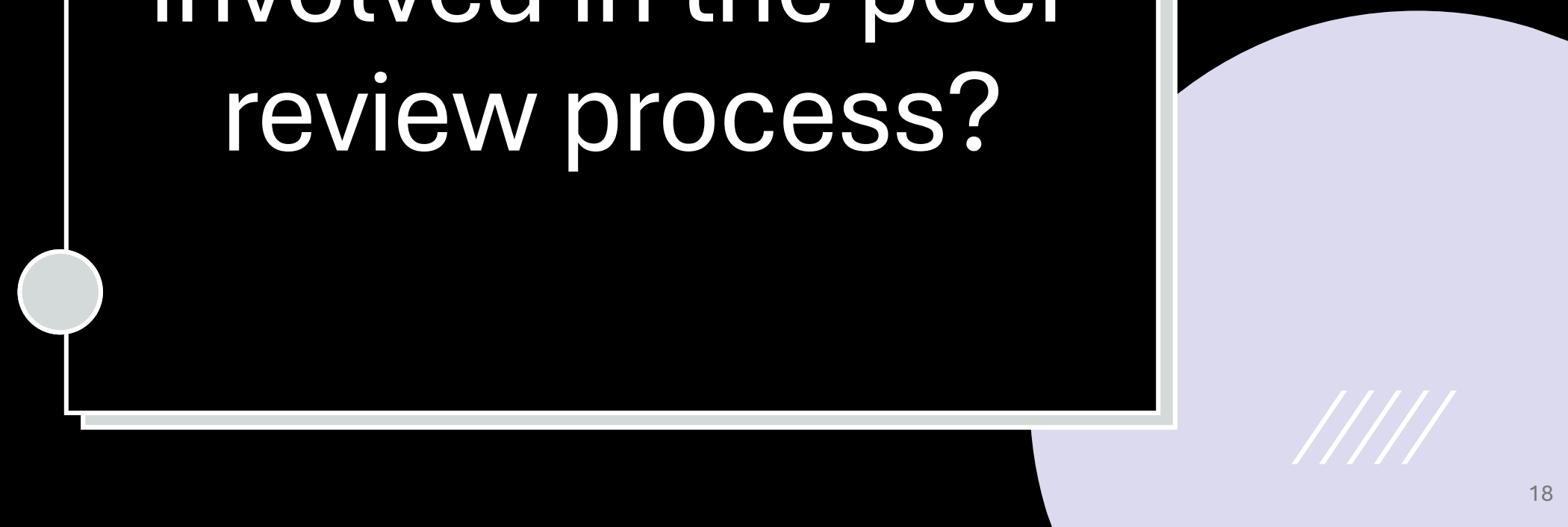*Peer review is the evaluation of work by one or more people with similar competencies as the producers of the work. It functions as a form of self-regulation by **qualified members** of a profession within the relevant field.*

—Wikipedia

Have you ever been involved in the peer review process?

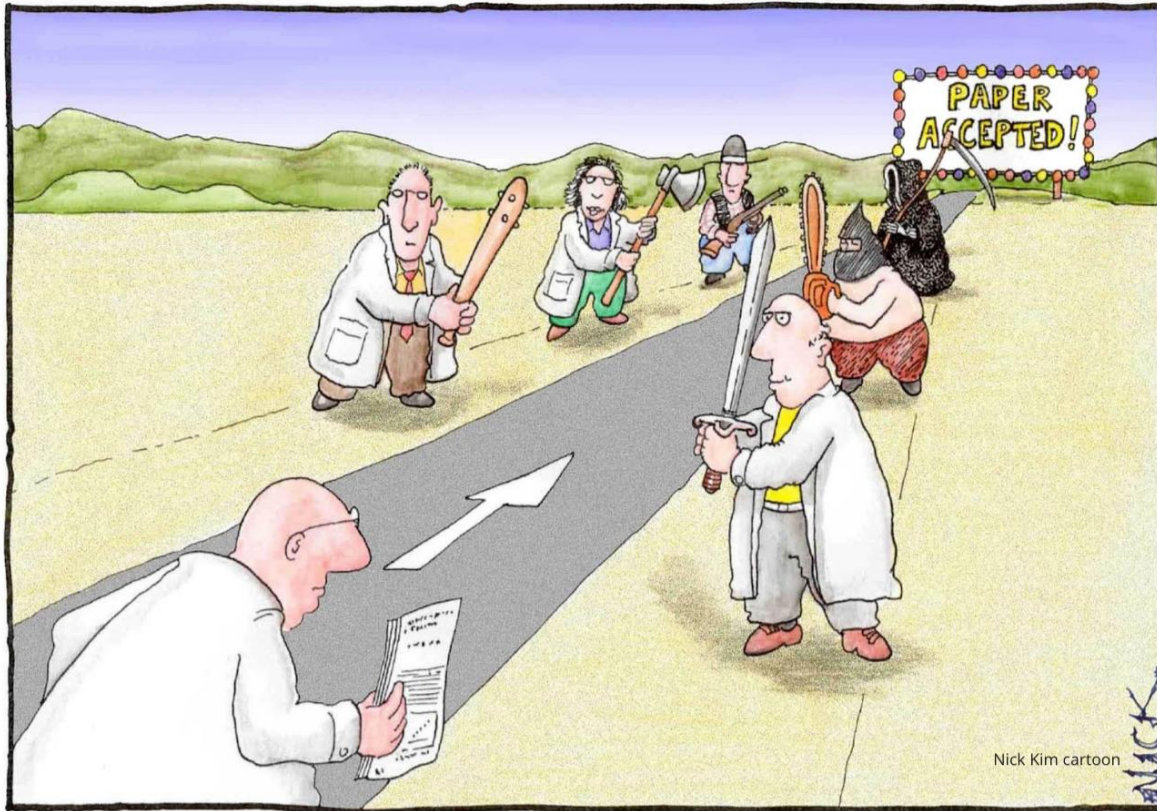# What are your impressions of peer review?

Depictions of Peer Review

Most scientists regarded the new streamlined peer-review process as "quite an improvement."

Nick Kim cartoon

- What can we deduce from this cartoon?

- Who holds the balance of power?

- Does this align with your experiences?

- Is this a fair depiction?

Content adapted from PREreview Champions training materials, Module 1

Depictions of Peer Review

WARNING!
PEER REVIEW IN PROCESS

REJECTED PAPERS

ARE DINOSUARS REAL?

CAN PIGS FLY?

LIFES WORK

ACCEPTED

https://twitter.com/digitalsci/status/781860071831642113
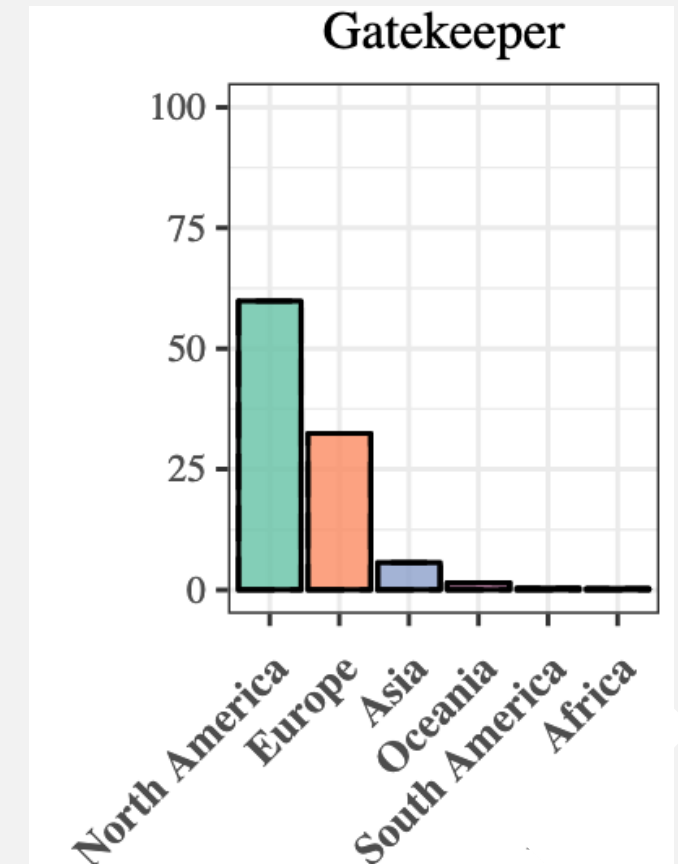
- What can we deduce from this cartoon?

- Does this align with your experiences?

- Is this a fair depiction?

What are "qualified members"?

- Gatekeepers: senior editors, reviewing editors, peer reviewers

- Gatekeepers are mostly males from Global North (esp. North America)
  - *Murray et al.*, 2019 (*bioRxiv*) https://doi.org/10.1101/400515

- Is this truly representative?

What are "qualified members"?
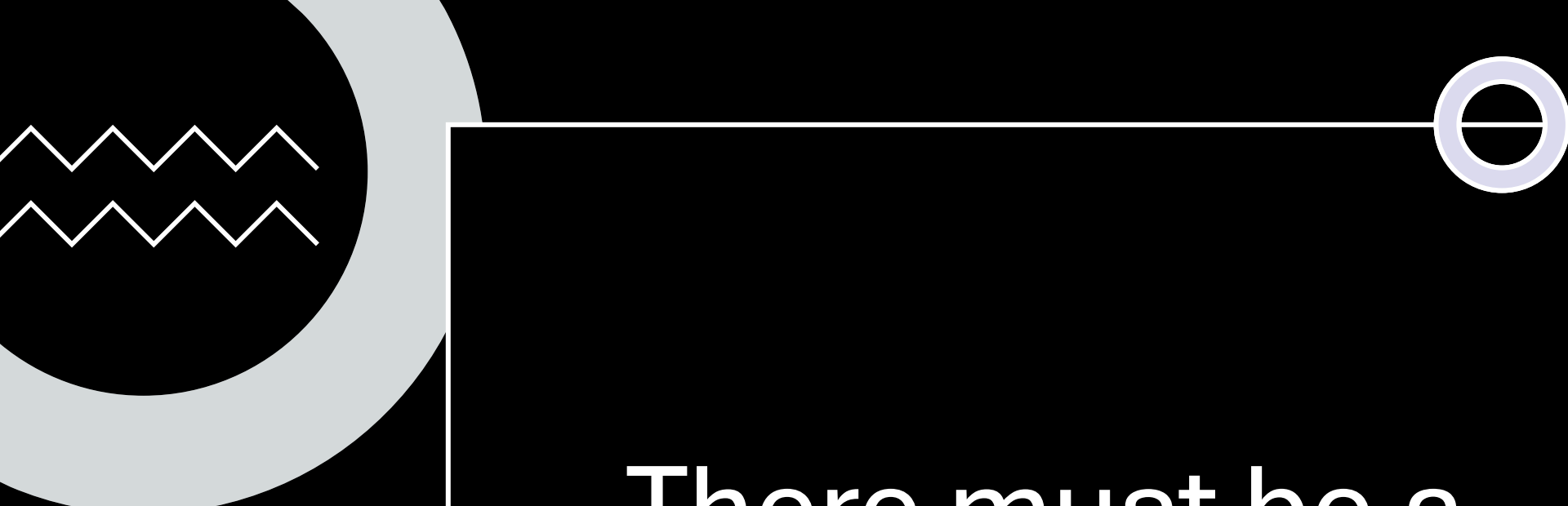
While they may participate in peer review process, the contributions of many early career researchers (ERCs) are not recognized
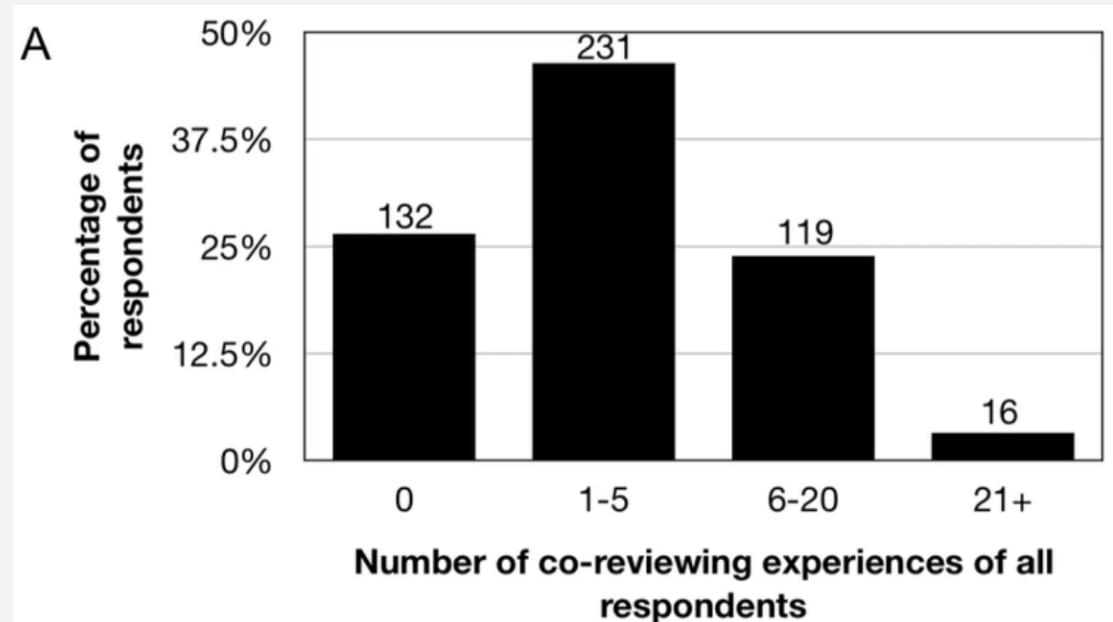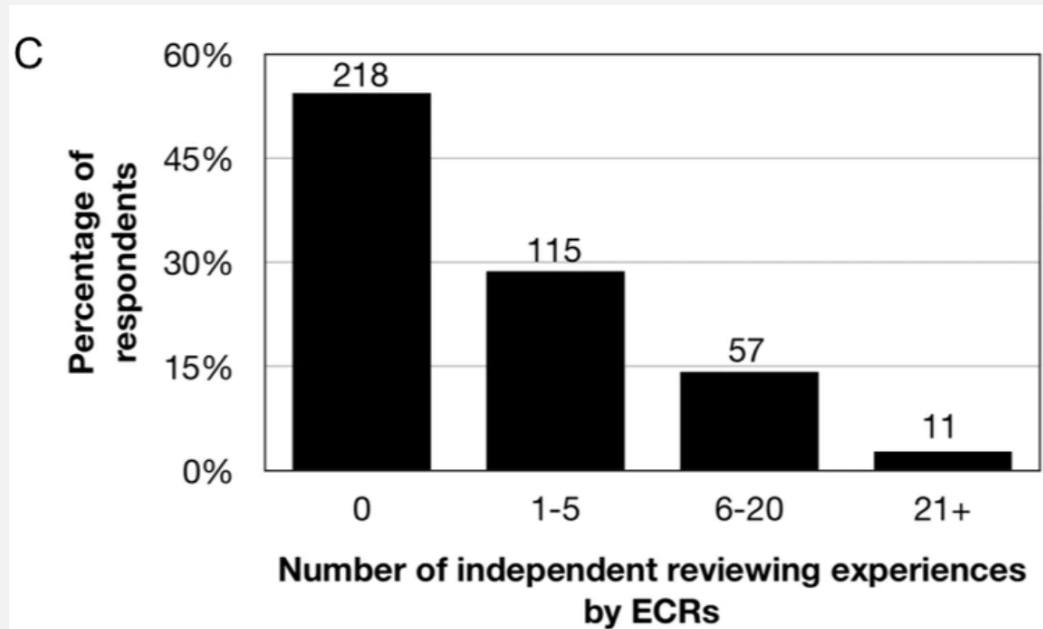
Peer review is inequitable and unsustainable

- The pool of reviewers is small and often insufficient for the number of review requests

- The composition of the reviewer pool is homogenous in many dimensions

- Most reviewers are male, mid- or late-career researchers selected by journal editors as "experts" in their field

- Yet, most have never received any formal training in conducting peer review

There must be a better way...

What aspects of peer review are beneficial?

What aspects of peer review should change?

Let's rethink peer review!

A new definition of peer review

—

*Peer review is **constructive, clear and actionable** feedback to research outputs shared openly, performed by someone who has expertise and/or experience relevant to the work.*

—PREreview

Types of peer review

Timing	Preprints	Pre-publication	Post-publication
Identifiability	Double blind	Single blind	Open
Mediation	Editors mediate all interactions between reviewers and authors	Reviewers interact with one another openly	Reviewers and authors all interact with one another openly
Publication	Peer reviews are not published	Peer reviews are published but not signed	Peer reviews are published and signed
Facilitation	Review facilitated by a journal	Review facilitated by a third party	Review facilitated by authors
Ownership	Review owned by a journal or third party	Review owned by the authors of the reviews	Shared or mixed ownership of reviews

https://publicationethics.org/files/cope-ethical-guidelines-peer-reviewers-v2_0.pdf

Content adapted from PREreview Champions training materials, Module 1

What makes peer review open?

A new definition of peer review

- Open **identities**: Authors' & reviewers' identities are known to each other

- Open **reports**: Review reports are published online

- Open **participation**: Anyone can contribute to the review process

- Open **interaction**: Discussion between authors & reviewers &/or between reviewers

- Open **manuscript posting** (as preprints prior to journal-led peer review): Manuscript drafts can be posted online on preprint servers prior to a journal submission

- Open **final-version commenting**: Open commenting on the final version of record (VOR)

- Open **platforms** ("decoupled review"): Independent discussion sites enable community review of manuscripts

Slide content adapted from PREreview Champions training materials, Module 1

The power of preprints

Preprints enable community-led open peer review
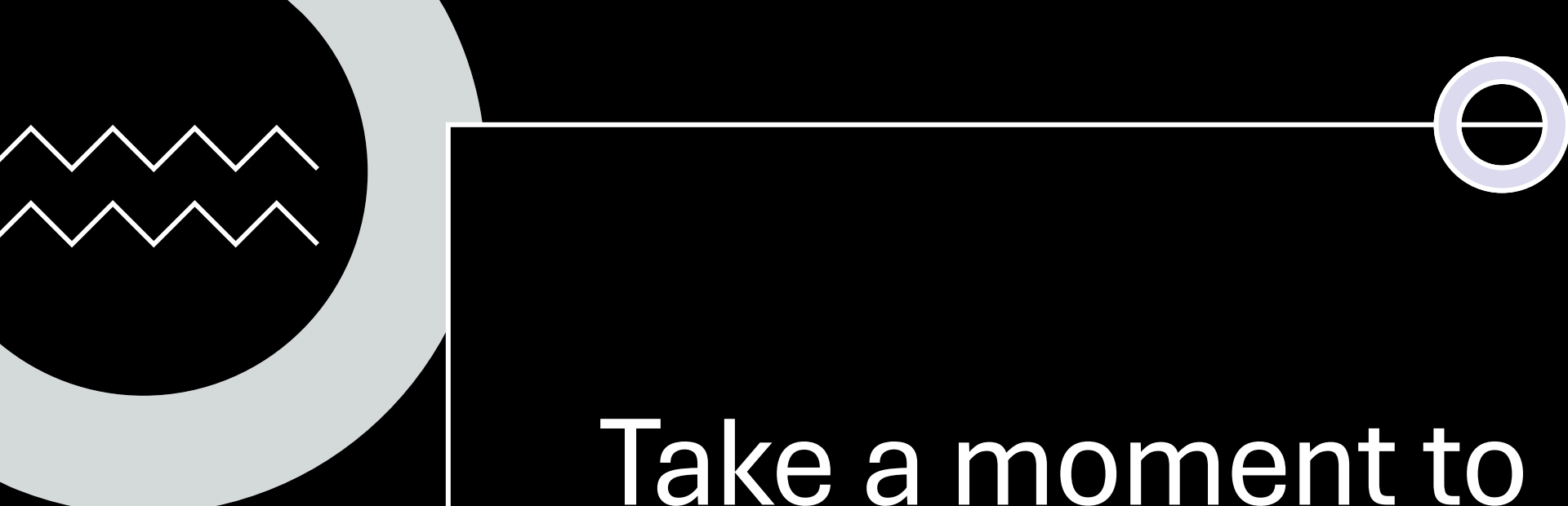
Power and privilege in academic publishing

People make up the publication system
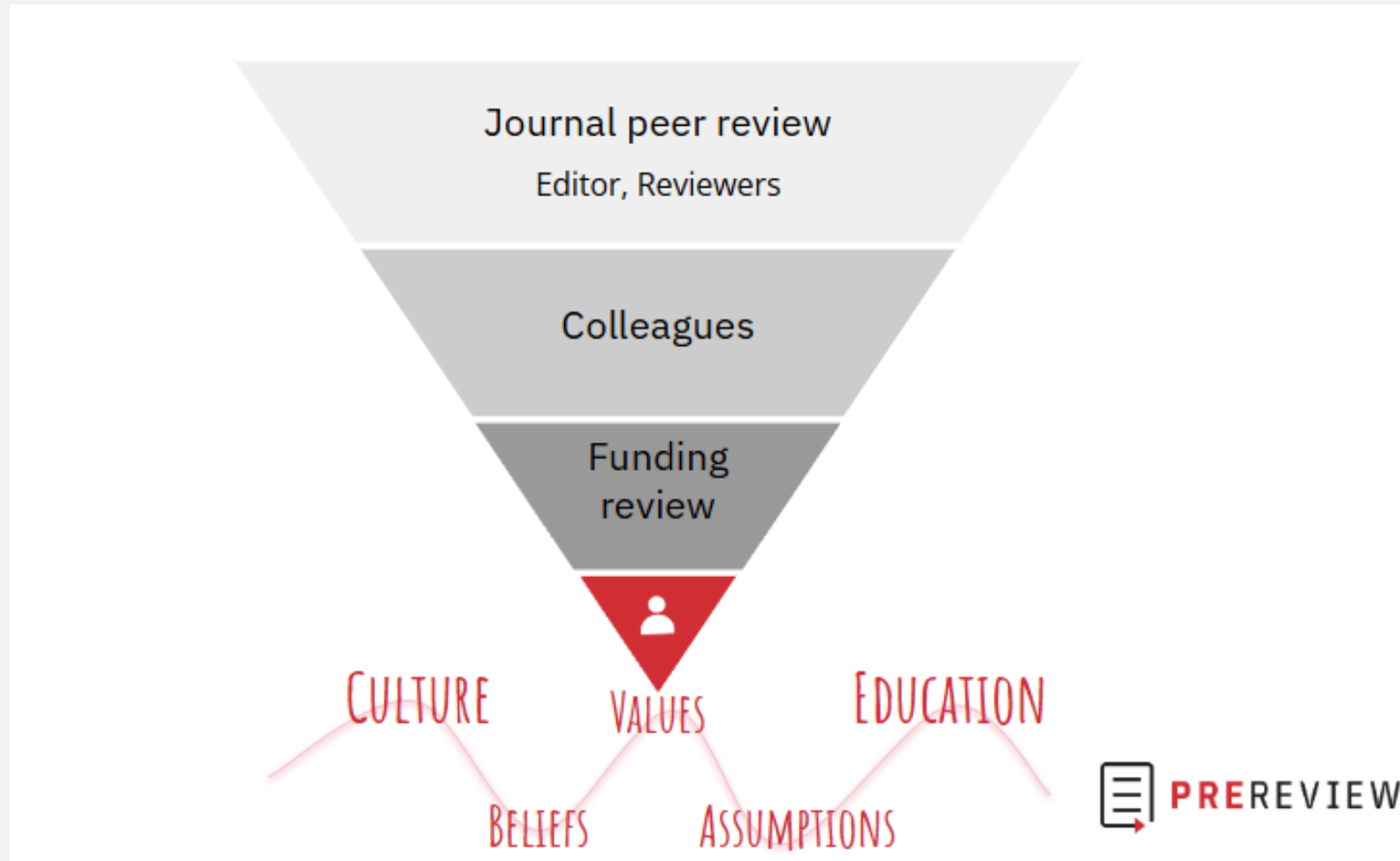
Take a moment to reflect on your own positionality

The Power Flower

—

- **Positionality**: an individual's unique combination of social identities, lived experiences, and values

- The Power Flower helps us to identify our own intersecting identifies and how they may contribute to oppression and privilege

Age
Gender
Ability
Ethnicity
Language
Wealth
Neurodiversity
Cultural Affiliation
POWER
Geography
Employment
Social Class
Citizenship
Sexuality
Body Type
Skin
Housing

Source: e-campus Ontario
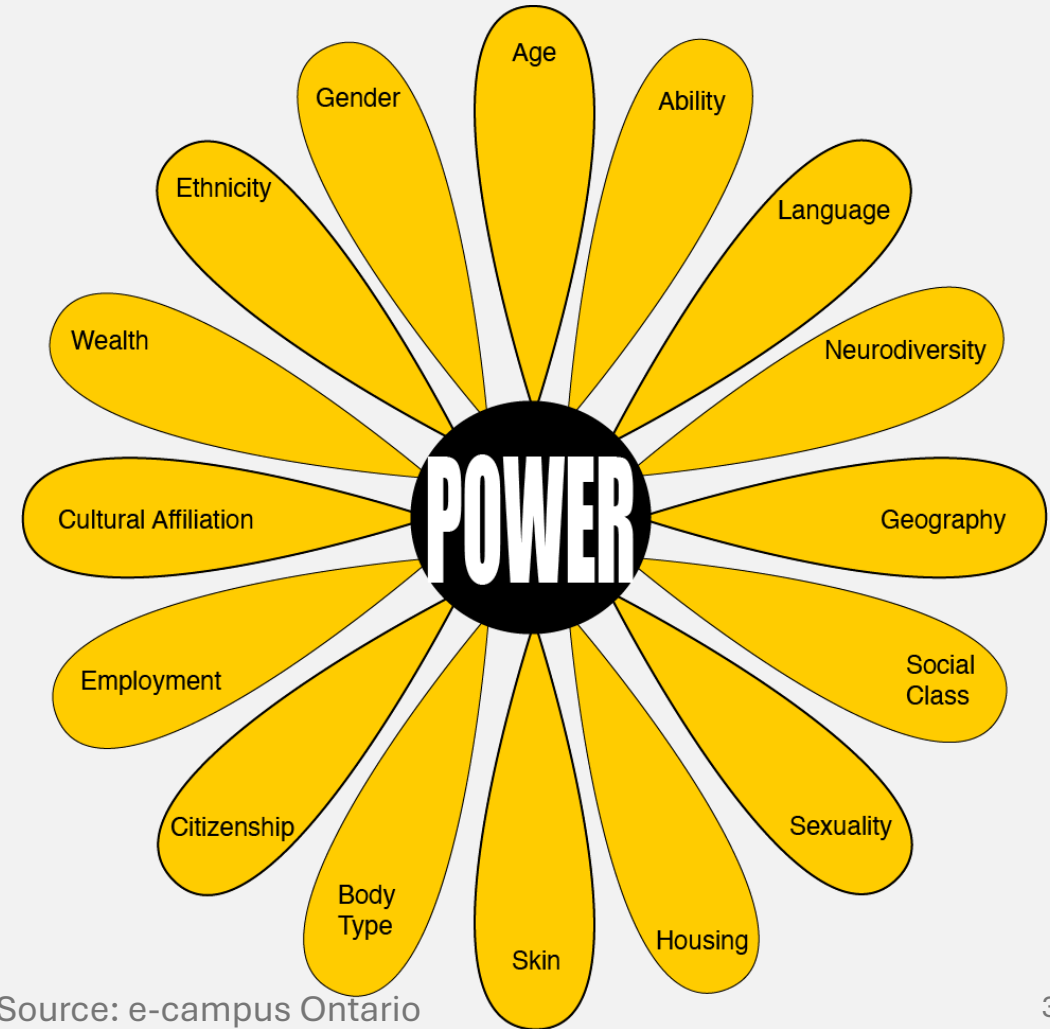
Systems of Oppression

Patriarchy   Heteronormativity   Colonialism   White supremacy culture

Systems of Oppression

Discriminatory institutions, structures, norms, policies, and practices embedded into our society used to oppress groups of people.

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Our understanding of the world shapes our research
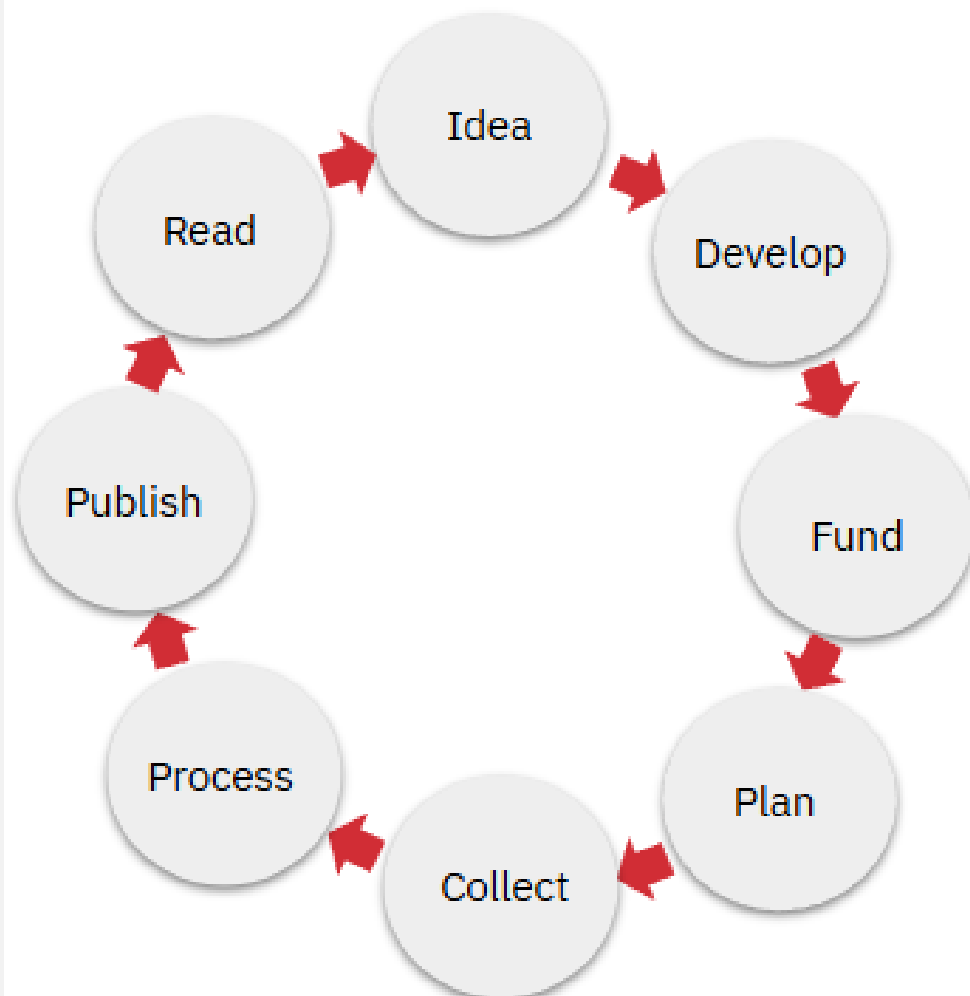
- The questions we ask
- How we design the study
- Who we allow to participate
- How we collect materials/data
- How we interpret the results
- Who we cite
- How/where we publish
- Who gets to disseminate knowledge

The anatomy of systemic oppression
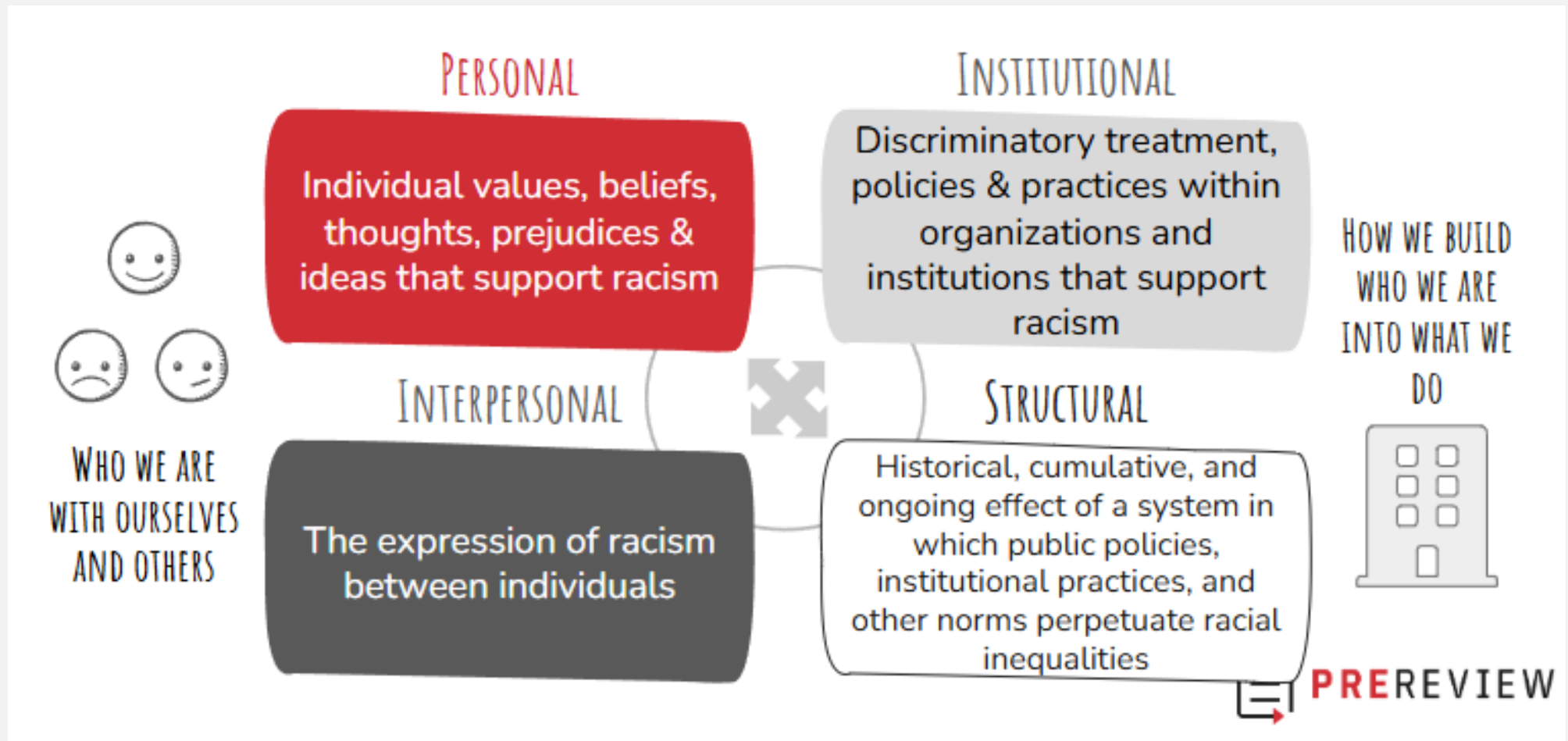
How do we interrupt oppression (in peer review)?

Identify and address internal beliefs and assumptions rooted in the oppression of others → **Personal**

Set up the conditions for individual and collective reflection and learning → **Institutional**

Implement policies that are rooted in anti-oppression → **Institutional**

Write clear and constructive feedback to authors → **Interpersonal**

Adopt and support the development of tools that facilitate and incentivize the interruption of oppression → **Structural**

Offer feedback to help delegitimize and prevent the wide dissemination of research that perpetuates oppression → **Interpersonal**

Challenge the definition of expertise → **Structural**

Incentivize and reward practices that interrupt oppression → **Structural**

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Avoiding the blaming and shaming trap

We are taught values, beliefs, cultural norms, and practices that shape our cultural understanding and have an impact in the way we live in the world.

Sexist 👎
Non-sexist 👍

Racist 👎
Anti-racist 👍
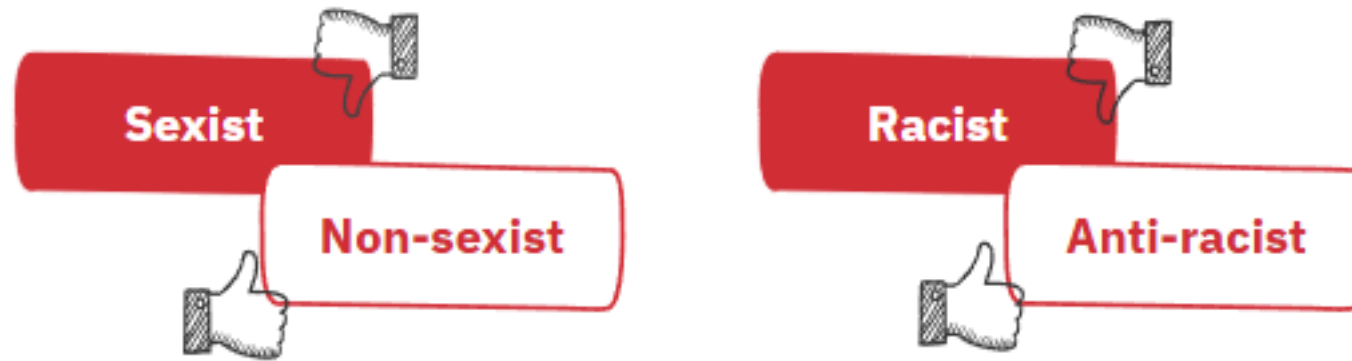
We have been taught that these conditioned beliefs and/or practices are tied to our own morality, so discussing them can trigger guilt or defensiveness.

These feelings can stop us from thinking critically, make us feel powerless, and prevent us from (un)learning and taking action.

"Either-or" thinking is also often not true

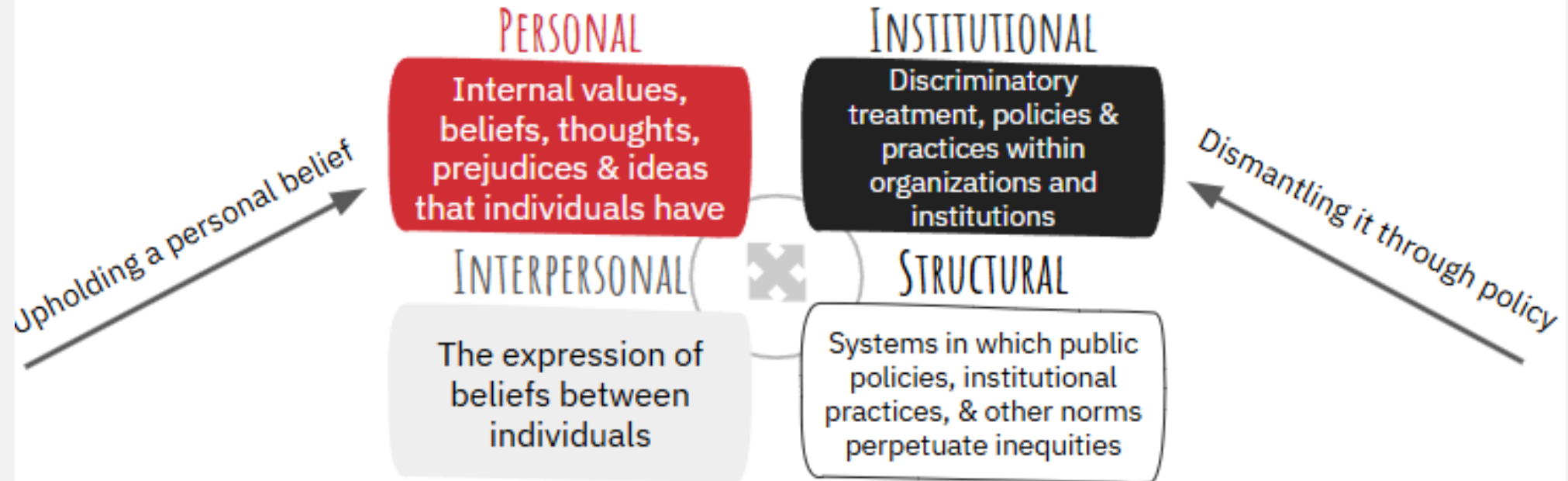**Example:** A person in a position to affect institutional policy at a University is actively working to recruit researchers from marginalized groups in science AND at the same time holds the belief (consciously or unconsciously) that research publications from the UK are of higher quality than those from Kenya.

PERSONAL
Internal values, beliefs, thoughts, prejudices & ideas that individuals have

INSTITUTIONAL
Discriminatory treatment, policies & practices within organizations and institutions

INTERPERSONAL
The expression of beliefs between individuals

STRUCTURAL
Systems in which public policies, institutional practices, & other norms perpetuate inequities

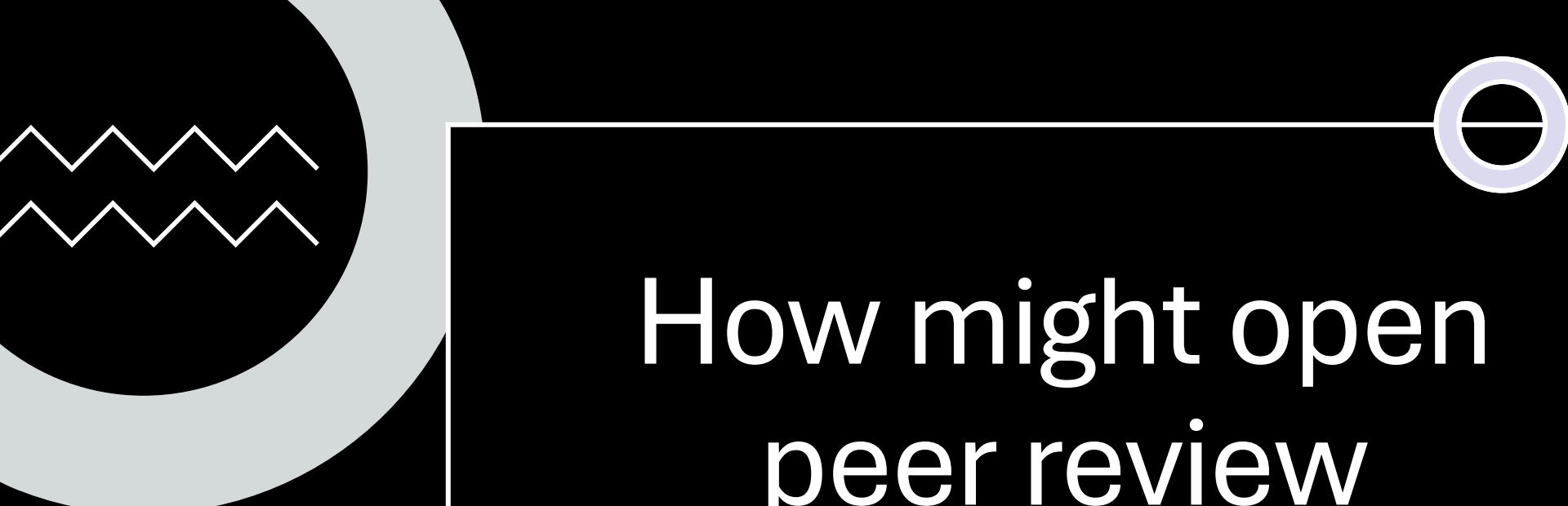*Upholding a personal belief*

Dismantling it through policy

It is possible (and common) to both uphold _and_ dismantle oppression.

Have you witnessed or experienced bias and oppression in scholarly research?

How might open peer review promote and uphold the values of EDIDA?

What is PREreview?

—

- Platform for **reviewing preprints** openly and collaboratively
- Focuses on engaging **early-career researchers** in peer review
- Promotes **constructive, inclusive, and transparent feedback**
- Offers tools, templates, and training for writing fair reviews
- Works to **challenge bias and inequity** in scholarly publishing
- prereview.org/resources

Examples of Resources

—

- [Reviewer Guide](#)

- [Bias Reflection Guide](#)

- [Review Assessment Rubric](#)

- And many more

- [prereview.org/resources](#)

Have you ever written a peer review or received one?

Writing a review step by step
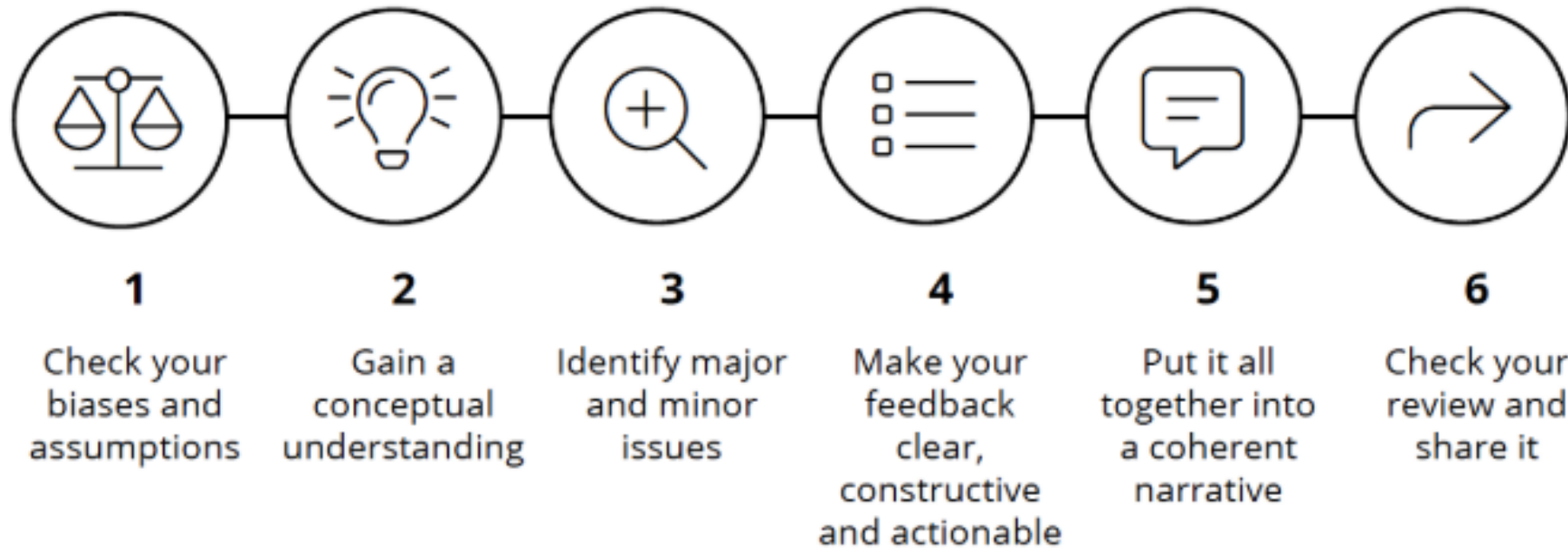
1 Check your biases and assumptions

2 Gain a conceptual understanding

3 Identify major and minor issues

4 Make your feedback clear, constructive and actionable

5 Put it all together into a coherent narrative

6 Check your review and share it

Adapted from: Foster, Antoinette, Hindle, Samantha, Murphy, Katrina M., & Saderi, Daniela. (2021). Open Reviewers Reviewer Guide. Zenodo. https://doi.org/10.5281/zenodo.5484087

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Contending with bias

—

*Bias is a **disproportionate weight** in favor of or against an idea or thing, usually in a way that is **closed-minded, prejudicial, or unfair**.*

—Wikipedia

Types of bias

EXPLICIT BIAS

A prejudice that turns into an action that is conscious, it occurs within our perceptive awareness

IMPLICIT BIAS

A prejudice that turns into an action that is unconscious, it occurs outside our perceptive awareness

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Content adapted from PREreview Champions training materials, Module 2

What are some examples of "bias" in peer review?

Writing a peer review

STEP 1: Reflect on personal bias

IDEA-R2

IDentify/Evaluate — Add — Reverse — Rephrase

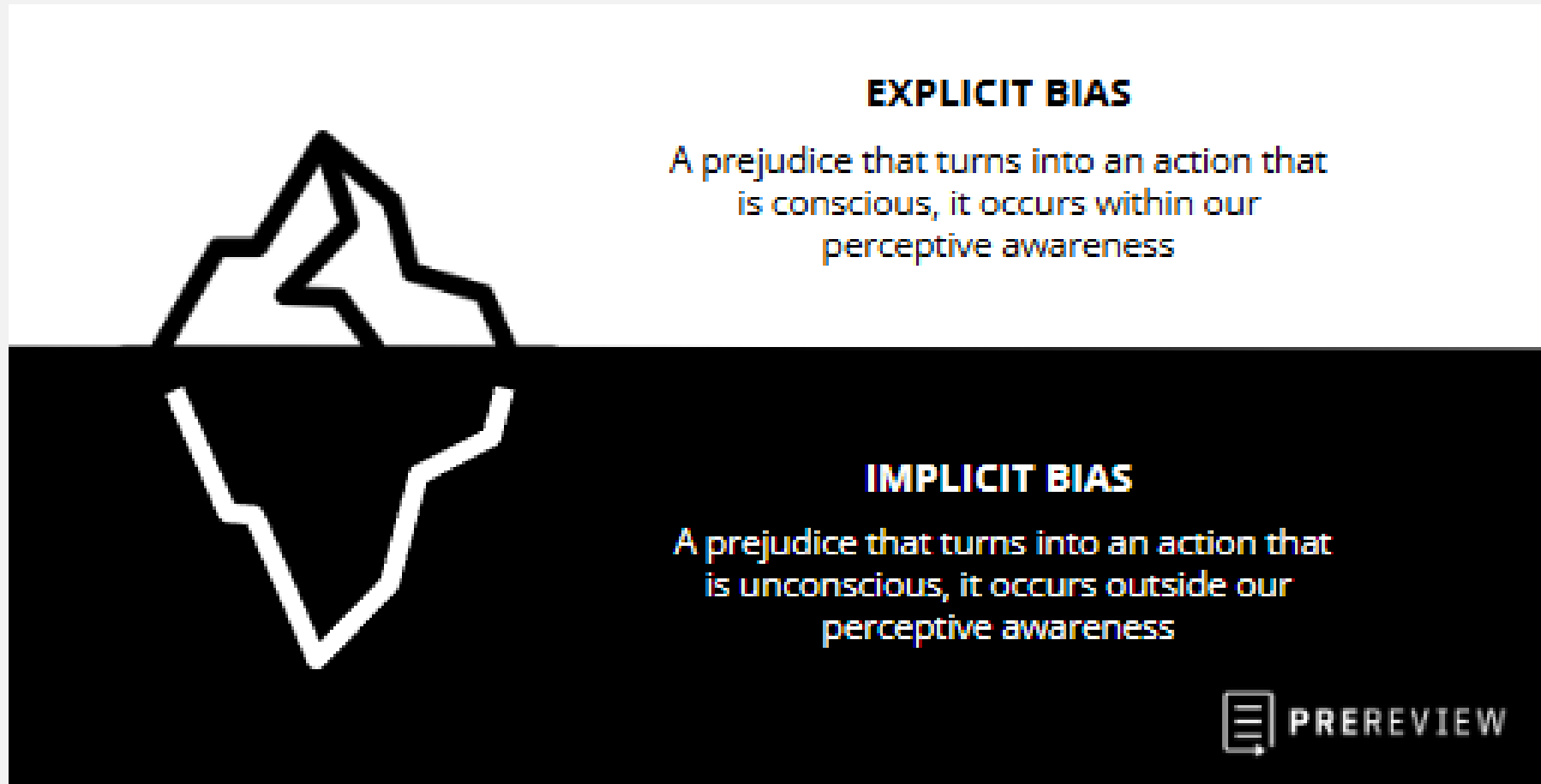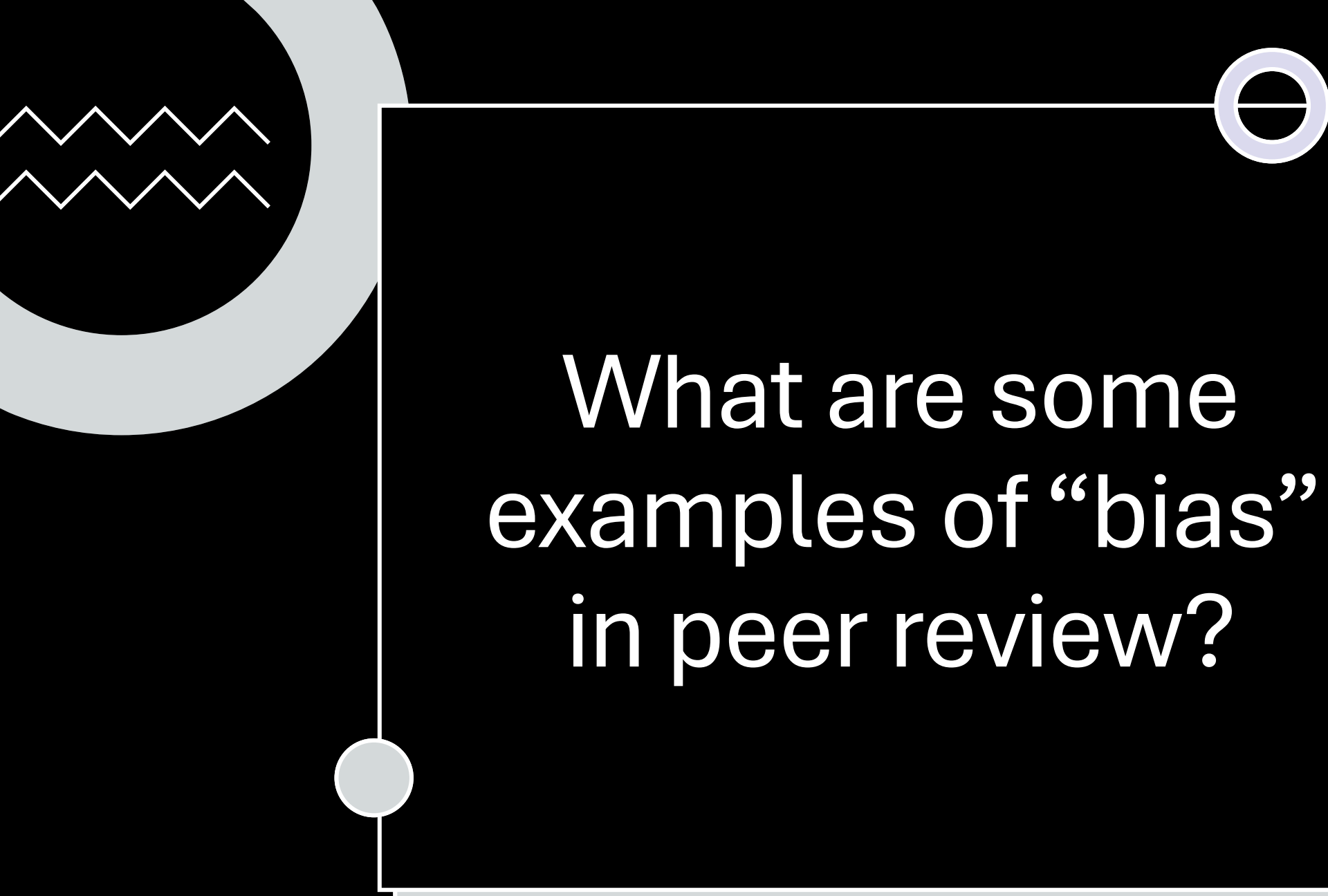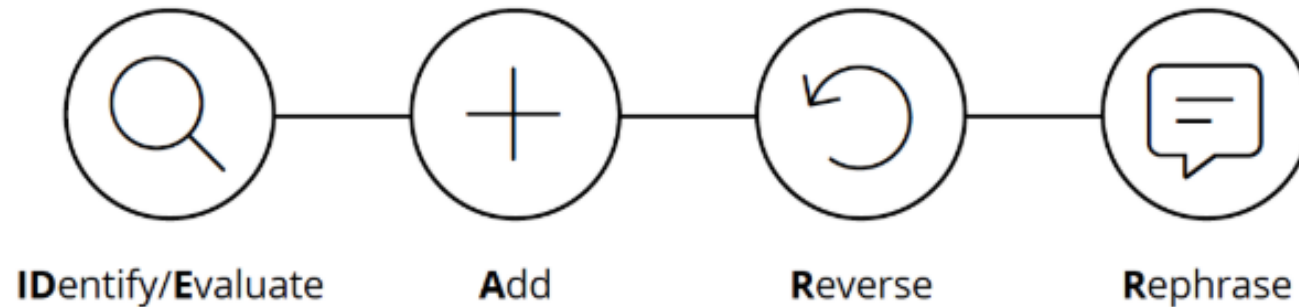Adapted from Foster, Antoinette, Hindle, Samantha, Murphy, Katrina M., & Saderi, Daniela. (2021). Open Reviewers Bias Reflection Guide. Zenodo. https://doi.org/10.5281/zenodo.5484052

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Writing a peer review

STEP 1: Reflect on personal bias
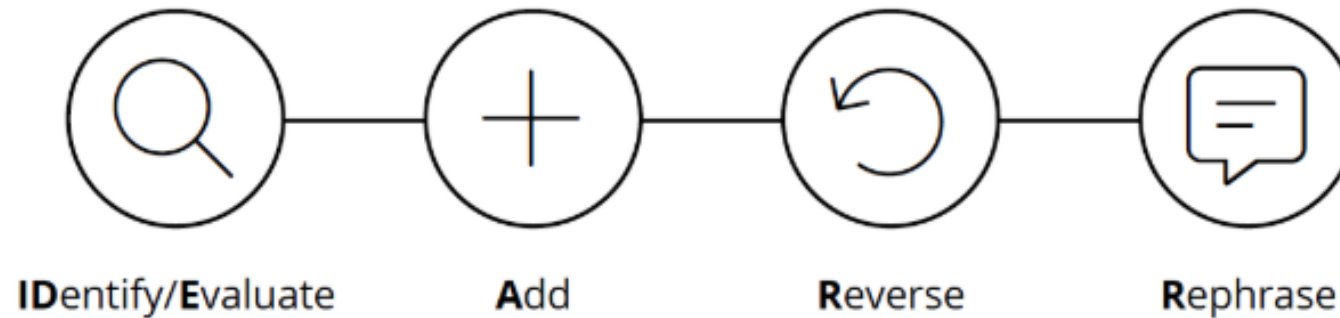
IDEA-R2

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Adapted from Foster, Antoinette, Hindle, Samantha, Murphy, Katrina M., & Saderi, Daniela. (2021). Open Reviewers Bias Reflection Guide. Zenodo. https://doi.org/10.5281/zenodo.5484052

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A "biased" statement

> *The senior author is at a late stage of their career and therefore is likely to be very experienced. Knowing this helps me feel more confident in the accuracy and reliability of the data and conclusions.*
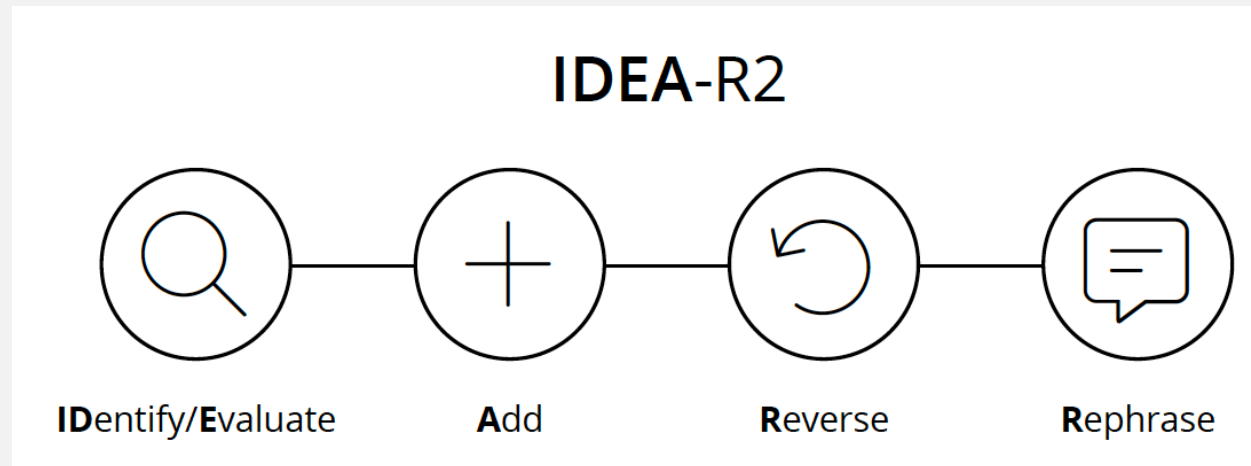
Writing a peer review

Writing a peer review

Evaluate

Is this logical? Is there a rationale that supports the notion that experience = trust in the quality of the work?

Their years of experience and them having gained the "respect" of the community may indicate that this study is likely good.

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Writing a peer review

Writing a peer review
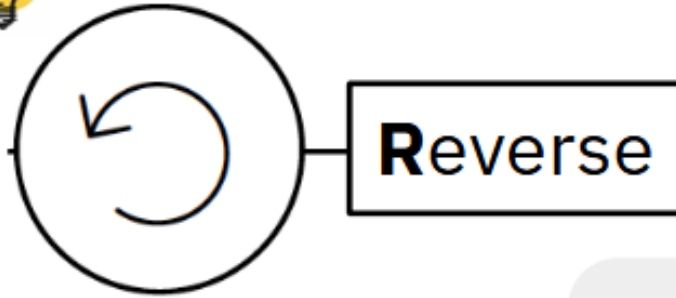
Are there situations I can think of in which the years of experience would not influence the quality of this manuscript?

The senior author may not have had time to revise the work, or this may be an unfamiliar technique so they don't have experience with how best to analyze these data.

Writing a peer review

Rephrase

Although the author's experience and recognition in the field may correlate with sound and rigorous experiments, data analysis, and conclusions, it is not something I can take for granted. There are many factors that could influence a manuscript's need for revision. I should remember that experience does not necessarily mean that the work is not questionable or that I can be quicker at evaluating the rigor of the work.

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Writing a peer review

STEP 2: Gain a Conceptual Understanding

- In your **first read-through** of the manuscript, try to avoid evaluating and instead **focus on *understanding***

- Evaluative/judgmental thoughts will inevitably pop up, but understanding *before* evaluating can help us **mitigate the impact of our personal biases**

- **Write down questions and evaluative thoughts** so you can focus on what the authors are trying to communicate and come back to them later

The goal during this step is not to look for flaws, but to understand the content.

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Writing a peer review

— STEP 3: Evaluate, Appreciate, Raise Concerns

- ◉ In your **second read-through**, you can begin identifying:

  - ○ **Positive aspects** of the research, as well as

  - ○ **Concerns** you may have about the project goals, the research question, the approach, methods, the results, data visualizations, figures and tables, etc.

- ◉ Highlight them and/or write them down to help you organize these notes later.

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Writing a peer review

Major concerns (issues)	VS	Minor concerns (issues)
Concerns the authors need to address before the manuscript is recommended for journal publication. Concerns that if left unaddressed could compromise the interpretation of the study.		Concerns that the authors should consider addressing to improve readability and general comprehension of the manuscript. Concerns that if left unaddressed would not affect the interpretation of the study.

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Writing a peer review

Major Concerns

- Unethical approach to research question, data collection and/or analysis

- Conclusions that are not supported by the data

- Contradictory conclusions

- Not accounting for and/or not appropriate discussion of study limitations and major confounding variables that can affect the results

- Issues with experimental design including insufficient sample size or data, improper controls, inappropriate methodology and/or statistical analyses

Minor Concerns

- Technical clarifications (*e.g.*, the authors should clarify how a reagent works)

- Data presentation/visualization

- Typos, spelling, grammar, and phrasing issues*

- Missing/wrong references/citations

* Poor spelling and/or grammar ≠ poor research

Writing a peer review

- It is important to consider not only what is being cited, but also *who* is being cited
  - **Whose voices** are represented?
  - **Whose work** is cited?

- As reviewers, we cannot recommend a diverse citation if our library, our knowledge isn't "diverse"
  - This is a tool we can use to evaluate our own citation practices
    Okune, Angela. (2019). Self-Review of Citational Practice. Zenodo

Writing a peer review

— STEP 4: Give clear, constructive and actionable feedback

CLEAR feedback is more likely to be interpreted correctly

CONSTRUCTIVE feedback is more likely to be well-received

ACTIONABLE feedback is more likely to be integrated

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Examples of feedback

Concern: Inappropriate statistical method

UNCLEAR, DESTRUCTIVE, NON ACTIONABLE	CLEAR, CONSTRUCTIVE, ACTIONABLE Interpretation - Reason - Recommendation - Depersonalization
"The authors should go back to statistics 101." 🚩 Here the reviewer is <u>attacking</u> the author at a personal level and <u>insulting</u> their education, which is not only <u>offensive</u> and <u>unprofessional</u>, but it is also <u>useless</u> to the authors as it <u>does not provide a way to improve the study</u>.	"Statistical [test X] is typically used for data that is distributed normally. The data presented in this manuscript appear to be highly skewed to the left. This type of distribution requires a non-parametric version of [test X], which makes no assumption on the parameters of the distribution of data. I suggest the use of [test Y]. If the choice of [test X] is motivated by a particular strategy or other non-obvious analytical constraints, I recommend to explicitly mention that in the Methods section justifying the choice accordingly."

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Writing a peer review

Step 5: Pull it all together into a coherent narrative
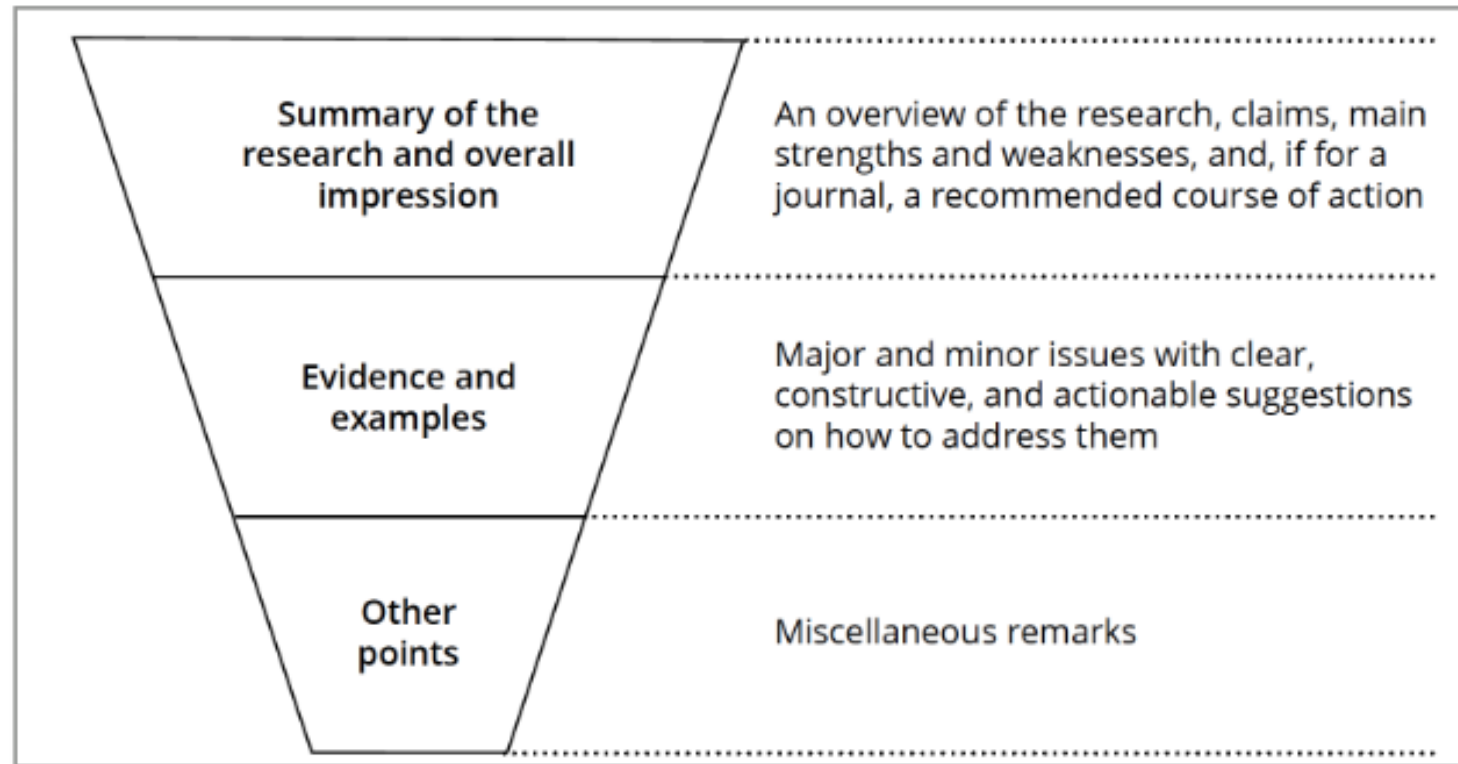
Summary of the research and overall impression — An overview of the research, claims, main strengths and weaknesses, and, if for a journal, a recommended course of action

Evidence and examples — Major and minor issues with clear, constructive, and actionable suggestions on how to address them

Other points — Miscellaneous remarks

Adapted from https://plos.org/resource/how-to-write-a-peer-review

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Writing a peer review

Step 6: Check your review and share it

Re-read your review consider the following:

- Thinking about STEP 1, the beliefs and assumptions you identified in yourself, how did you do in your review? Did you manage to keep those in mind and mitigate how they affected your judgment?

- Thinking about STEP 3, does your review highlight strengths as well as weaknesses of the study?

- Thinking about STEP 4, does your feedback sound constructive, is it clear and as actionable as it can be?

- Does your review read well, from the summary to the end?

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Helpful Resources by PREreview

- Bias Reflection Guide
- Reviewer Guide
- Review Assessment Rubric
- PLOS Peer Review Center
- COPE Ethical guidelines for peer reviewers
- 'Editorial Peer Reviewers as Shepherds, Rather Than Gatekeepers'
- Okune, Angela. (2019). Self-Review of Citational Practice. Zenodo

For more resources of this collection, visit their Zotero library here

Activity: Simulated Peer Review

Simulated Preprint Review

—

Step 1: Choose a paper from your Zotero library you are familiar with.

Step 2: Read the paper first for understanding, then through a critical, but constructive lens.

Step 3: Use the PREreview review template to write a constructive review of one minor/major concern

Content adapted from PREreview Champions training materials, Module 2

Activity: Simulated Preprint Review

Simulated Preprint Review

Step 1: Find a short computer science paper on arxiv.org or a NeurIPs short paper
  Suggestion: https://arxiv.org/abs/2501.12948

Step 2: Read the preprint first for understanding, then through a critical, but constructive lens

Step 3: Use the PREreview review template to write a constructive review of one minor/major concern

Reflect on your "mini review" experiences

Food for thought

—

- How did you make space for uncertainty or diverse perspectives in your comments?

- Were there moments where bias or assumptions might have shaped your review? How can we be mindful of our biases when reviewing preprints?

- What does it mean to write a review that is both critical and kind?

Any Questions?

Thank you!