

Scientific publishing

The nuts and bolts of the editorial process, peer review, & critical appraisal with a case-based example

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Serena Orr – Disclosures



- Relationships with financial interests:
 - **Grants/Research Support:** I hold research grants from CIHR (PI and co-PI) and the American Headache Society
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 - **Other:** I receive royalties from Cambridge University Press for book publication; I am on the editorial boards of Headache, Neurology, and the American Migraine Foundation

Objectives

- Some insights into
 - Peer review & the editorial process
 - How to do critical appraisal
- A case-based example to apply principles



Image from: freepik.com

Peer review & critical appraisal: why?



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Peer review: is anyone doing it?



~4-5 manuscripts/year/scientist

15,000 years of work in 2020

The process

The scientist



The editors

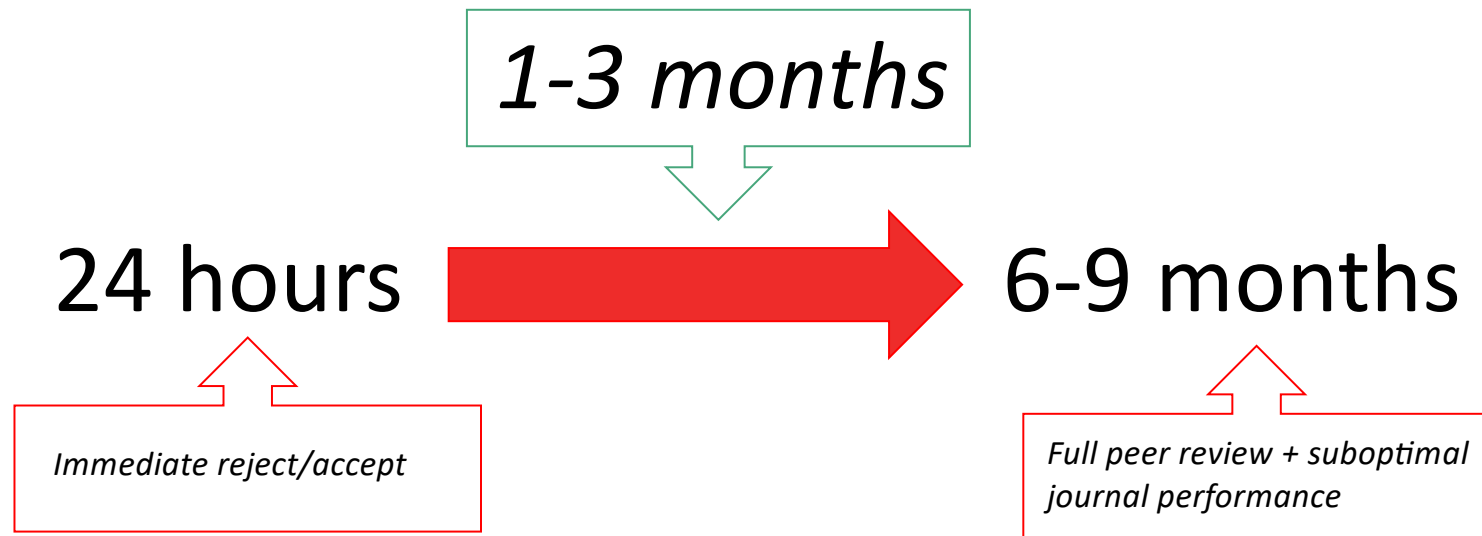


The reviewers



Image from: soconnectedllc.com; hungryshredder.com; vectorstock.com

The timelines



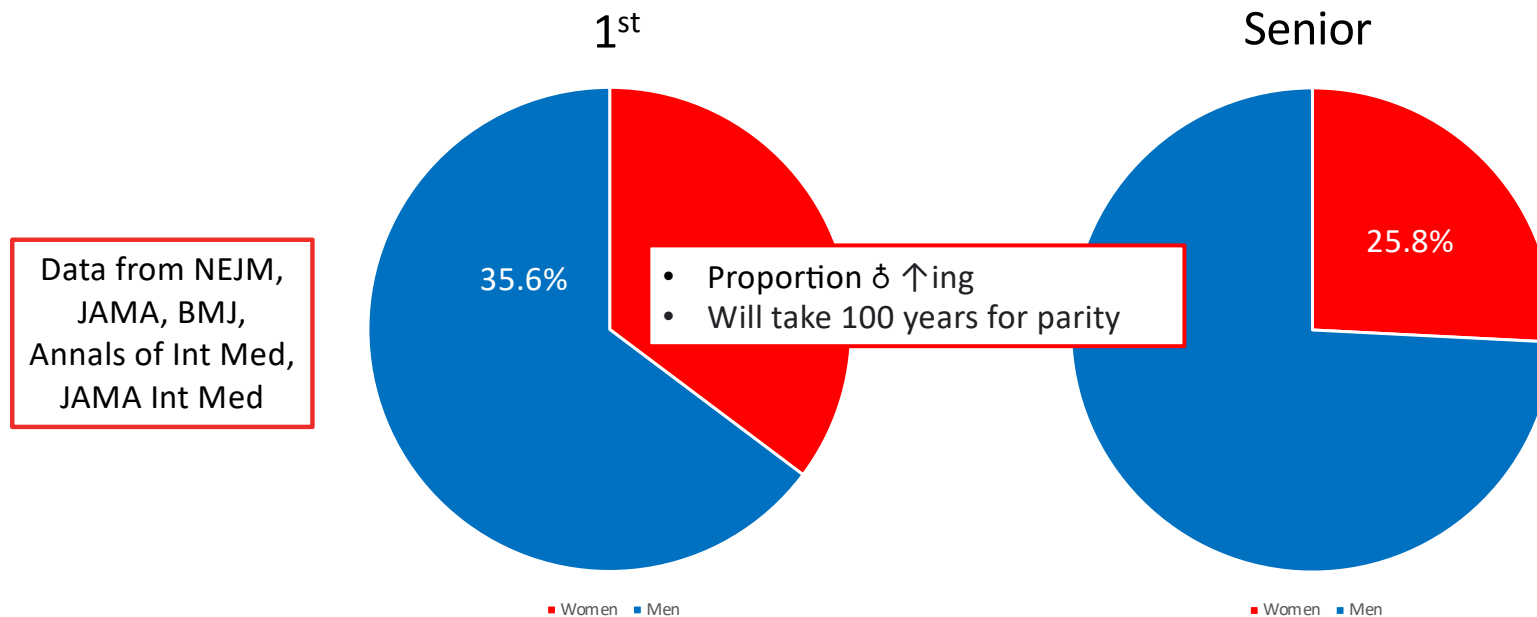
The outcomes

- ✓ Reject ← 1/3 immediate; 1/3 after peer review
- ✓ Major revisions ←
- ✓ Minor revisions ←
- ✓ Immediate accept ←



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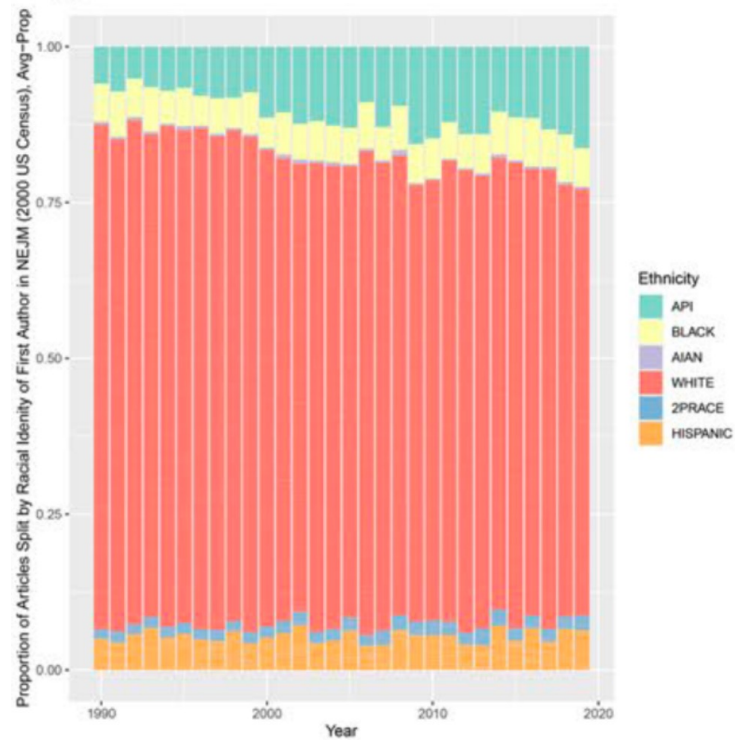
Is it equitable?



Chatterjee P, Werner RM. JAMA Netw Open 2021;4(7):e2114509; Abdalla M et al. J Racial and Ethnic Health Disparities 2023;10(2):920–9.

Is it equitable?

Data from NEJM
1st authors



Ways to make it more equitable



Image from: freepik.com; dreamstime.com

Factors considered



Making It [Sound] 🔥

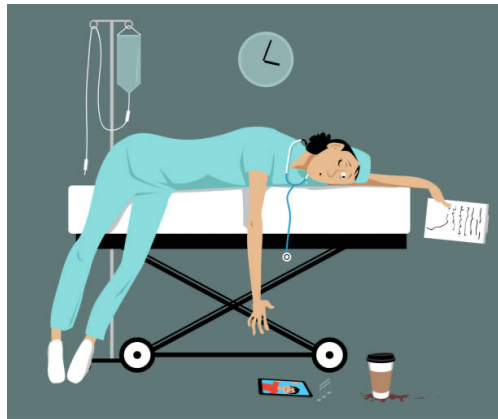


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Making It [Sound]



Image from: Lingard L, Watling C. Acad Med 2016;91(12):e12.

Making It [Sound]

- How would you make this sound more exciting?
 - *Children and adolescents can have migraine. There is overlap between migraine, anxiety, and depression in this population but it isn't clear why. In this study, we will explore the relationship between baseline anxiety and depression scores, and migraine-related outcomes in youth.*

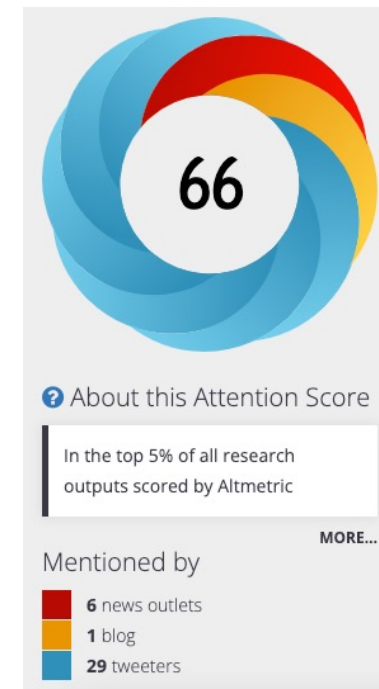




Type of Paper



- How do we define & measure impact?
 - # citations
 - Altmetric score
 - Media uptake
- What types of papers perform best?



Type of Paper



Also:

- Well done reviews = ↑ citations
- Hot topics = media attention



Type of Paper – Reporting



Enhancing the QUALity and
Transparency Of health Research



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main study types

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Image from: equator-network.org

Methods – Ethics



- ICH E11 = ICH pediatric guideline
- Pediatric data should be generated unless use clearly inappropriate
- Consider:
 - ✓ Age stratification based on developmental biology and pharmacology
 - ✓ Different design for different ages
 - ✓ Different measurement instruments for subjective symptoms (e.g., pain)

Methods – Ethics



Risk Justification	Adult Studies	Pediatric Studies
Anticipated direct benefits to participants	✓	✓

Import

FDA definition of minimal risk:

“the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests”

- If s
im

- All international guidelines aim to limit children’s exposure to **non-therapeutic risk**

Roth-Cline M et al. Handb Exp Pharmacol 2001;205:219-44.

Methods – Ethics (Assent)



- Assent, 4 elements:
 - ✓ Developmentally appropriate understanding
 - ✓ Disclosure of nature of intervention, what is involved
 - ✓ Assessment of child's understanding of information
 - ✓ Solicitation of willingness of child to accept intervention
- Children must assent
 - Unless incapable or direct benefit only possible through research
 - Absence of dissent ≠ assent

Methods – Ethics (Consent)



- Consent by
 - Parent/guardian as surrogate, OR
 - Mature minor
 - Definitions vary based on local regulations/ethics boards
- Should
 - Be written
 - Have a copy given to participant



Roth-Cline M et al. Handb Exp Pharmacol 2001;205:219-44; image from: hollandbloorview.ca

Methods – Ethics (Compensation)



- Compensation
 - Reasonable & ethics reviewed
 - AAP recommends gifts instead of \$



Roth-Cline M et al. Handb Exp Pharmacol 2001;205:219-44; image from: hollandbloorview.ca

Methods – Evaluating Ethics



- Questions to ask:
 - ✓ Is recruitment of children and adolescents (CA) justified?
 - ✓ Are CA and families involved in research design and conduct?
 - ✓ Are consent and assent arrangements adequate?
 - ✓ Have risks been assessed and mitigated?
 - ✓ Are payments reasonable and not “undue” in influence?
 - ✓ Do researchers have appropriate expertise?
 - ✓ Pediatric training/expertise
 - ✓ Training in study-specific design type



Phillips B et al. Arch Dis Child 2019;104(6):601–4; image from: flaticon.com

Methods – Team

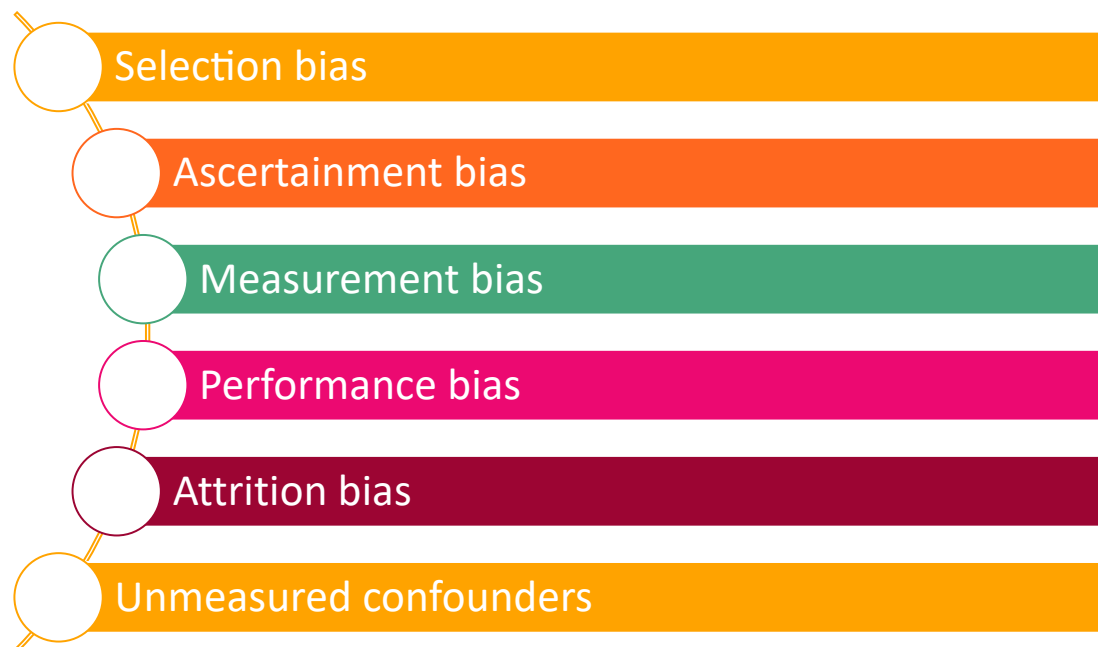


Methods – Statistics



- Common statistical pitfalls
 - ✓ No a priori sample size determination
 - ✓ Multiple hypothesis testing with no α correction
 - ✓ Inappropriate choice of test for data
 - ✓ Not checking test assumptions
 - ✓ Casewise deletion with $> 5\%$ missing data

Methods – Internal Validity



Methods – External Validity

- Sample $\neq$ general population
 - Not diverse
 - Not population-based
 - Single center
 - Tertiary/quarternary care-seeking



Image from: dreamstime.com

The Writing & Language



- Ensure
 - ✓ No spelling mistakes, typos
 - ✓ English language proficiency
 - ✓ Patient-centered language
 - ✓ Sex/gender not conflated
 - ✓ Culturally sensitive language
 - ✓ Minority sensitive language
 - ✓ No [self-] plagiarism



Image from: istock.com

The Paper



RESEARCH ARTICLE

Association Between Peer Victimization, Gender Diversity, Mental Health, and Recurrent Headaches in Adolescents

A Canadian Population-Based Study

Christelle Nilles, MD, Jeanne V.A. Williams, Msc, Scott Patten, MD, PhD, Tamara Pringsheim, and Serena L. Orr, MD, MSc

Neurology® 2023;101:e1654-e1664. doi:10.1212/WNL.0000000000207738

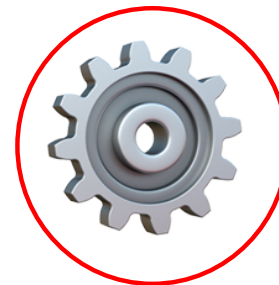
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Factors Considered



Study type?
Checklist?



Ethical issues?
Appropriate team?
Statistical issues?
Internal validity?
External validity?



Language issues?

My Thoughts



Cross-sectional study
STROBE followed ✓
No longitudinal
measurements ✗



Statistical issues:

- No a priori sample size ✗
- Missing data handling ✗

Internal validity problems:

- Ascertainment bias ✗
- Measurement bias (headaches, bullying, suicidality, & anx/dep) ✗
- Loss to follow-up – N/A
- No ethical/team issues ✓
- External validity ✓



No language issues ✓

Take Home

- Peer review/critical appraisal
 - ✓ The machine that ensures quality in our science
 - ✓ Essential for all MDs
 - ✓ Can & should be done systematically
 - ✓ Is fun
- Please help!



Questions



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