

INTRODUCTION TO OPEN SCIENCE

OPEN SCIENCE STUDENT
SUPPORT GROUP

OCT. 9, 2020

GWEN VAN DER WIJK



Image by Adam Douglas



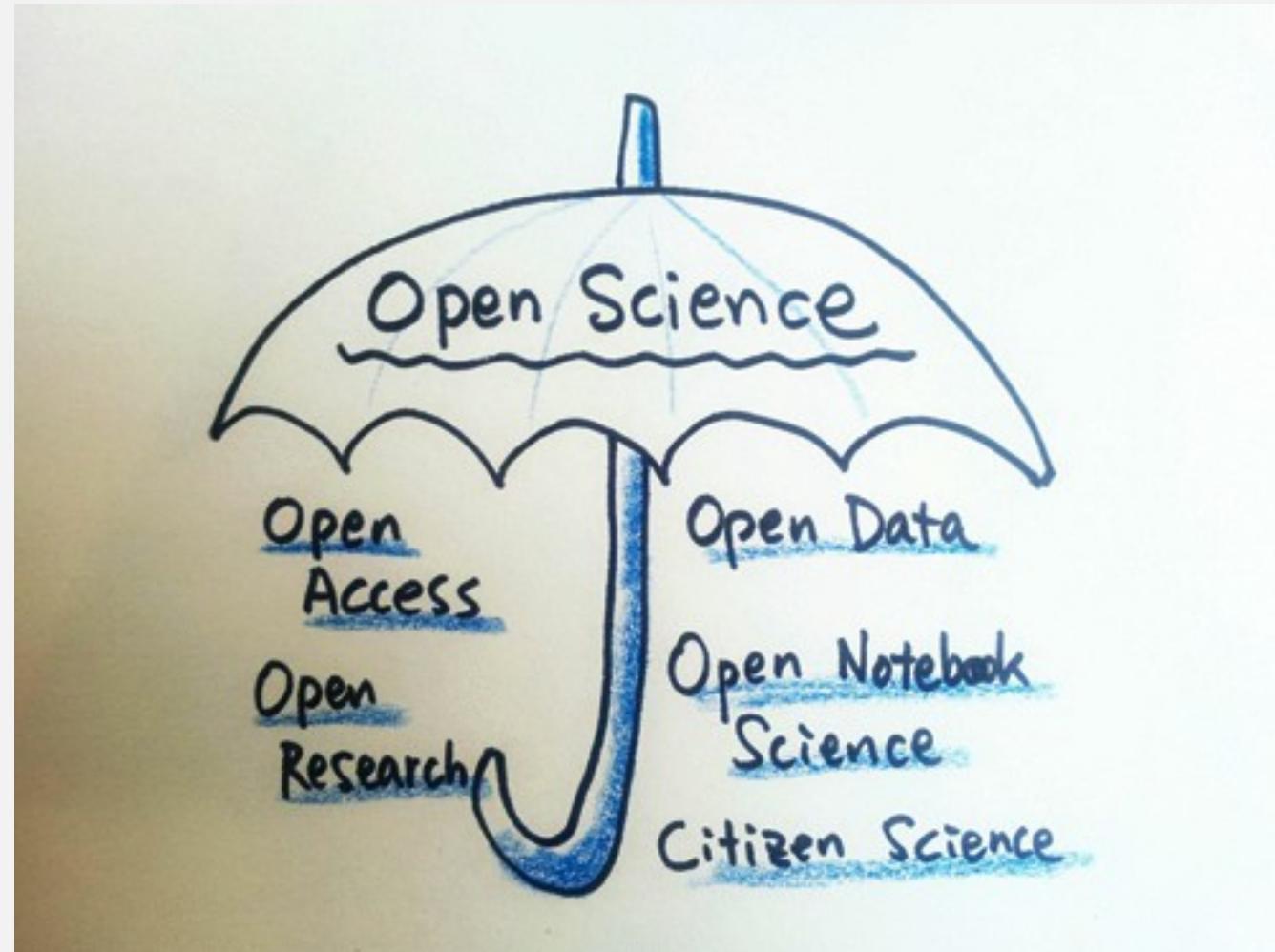
G WEN
(SHE/ THEY)

- Dutch/Hungarian – biking, reading, puzzles
- 3rd year PhD student with Dr. Andrea Protzner (Brain dynamics lab)
- Neuroimaging research on major depressive disorder
- Running into issues/frustrations
- Not an expert on Open Science
- Support group: vulnerability, humility, support



WHAT IS OPEN SCIENCE?

- Transparency
- Accessibility
- Inclusivity
- Reproducibility
- Reliability
- Credibility
- Collaboration



“Open Science is just good science” - Tennant, 2018

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WHY WE NEED OPEN SCIENCE

“The Open Science Movement developed in response to the culture of secrecy and skepticism that has been pervasive throughout scientific research.”

Kathawalla et al., 2019, p3



ISSUES IN SCIENCE

Questioning the credibility of science

- The replication crisis (only 36% of studies replicated with half the effect size (Nosek et al., 2015))
- Questionable research practices & statistical errors/misinterpretation (~50% of articles; Arnheim et al., 2019; Nuijten et al., 2015)
- Publishing culture (publication bias, Joober et al., 2012)

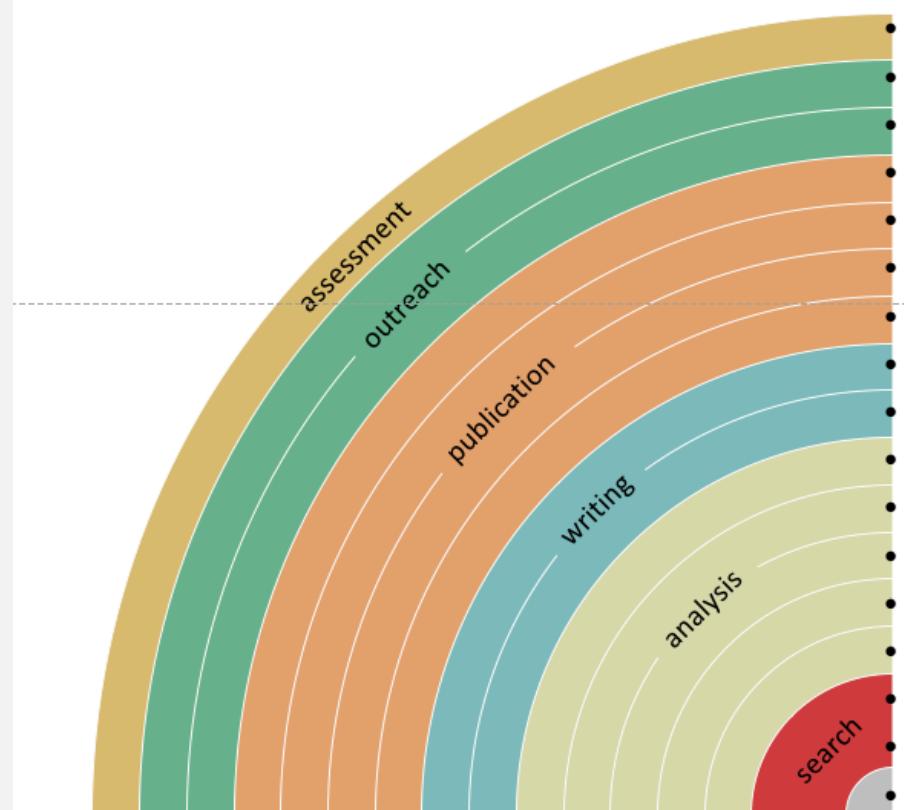
Restricted accessibility/paywalls to science

- ~75% of articles are behind paywalls (~30-40% profit margins; Larivière et al., 2015; Piwowar et al., 2018)
- Slows/restricts advances



HOW TO: OPEN SCIENCE

You can make your workflow more open by ...



- adding alternative evaluation, e.g. with altmetrics
- communicating through social media, e.g. Twitter
- sharing posters & presentations, e.g. at FigShare
- using open licenses, e.g. CC0 or CC-BY
- publishing open access, 'green' or 'gold'
- using open peer review, e.g. at journals or PubPeer
- sharing preprints, e.g. at OSF, arXiv or bioRxiv
- using actionable formats, e.g. with Jupyter or CoCalc
- open XML-drafting, e.g. at Overleaf or Authorea
- sharing protocols & workfl., e.g. at Protocols.io
- sharing notebooks, e.g. at OpenNotebookScience
- sharing code, e.g. at GitHub with GNU/MIT license
- sharing data, e.g. at Dryad, Zenodo or Dataverse
- pre-registering, e.g. at OSF or AsPredicted
- commenting openly, e.g. with Hypothes.is
- using shared reference libraries, e.g. with Zotero
- sharing (grant) proposals, e.g. at RIO



OPEN ACCESS TO...

- Articles:
 - Open access journals
 - Preprints
- Data:
 - Public databases (ethics)
- Code/methods:
 - Open source software



[Open Access explained!](#) by PHD Comics ([CC BY](#))



TRANSPARENT/ROBUST METHODS

- Project workflow
- Preregistration/
registered reports
- Open Science
Framework

The screenshot shows the OSF project page for the 'Open Science Student Support Group'. At the top, there's a navigation bar with links for 'My Quick Files', 'My Projects', 'Search', 'Support', 'Donate', and a user profile for 'Gwen van der Wijk'. Below the navigation is a secondary menu with 'Open Science Student Suppo...', 'Files', 'Wiki', 'Analytics', 'Registrations', 'Contributors', 'Add-ons', and 'Settings'. The main title 'Open Science Student Support Group' is displayed. A red oval highlights the 'Contributors' section, which lists Gwen van der Wijk, Emiko Muraki, Hongye Wang, Michael McCarthy, Matt Dawson, Jassleen Parmar, Kelsey Cnuude, Brittany Lindsay, and Chelsea Moran. Another red oval highlights the 'Public' button in the sharing options. A third red oval highlights the 'Recent Activity' section, which shows a log entry: 'Emiko Muraki added file OSSSG How to Develop Session Challenges.docx to OSF Storage in Open Science Student Support'.

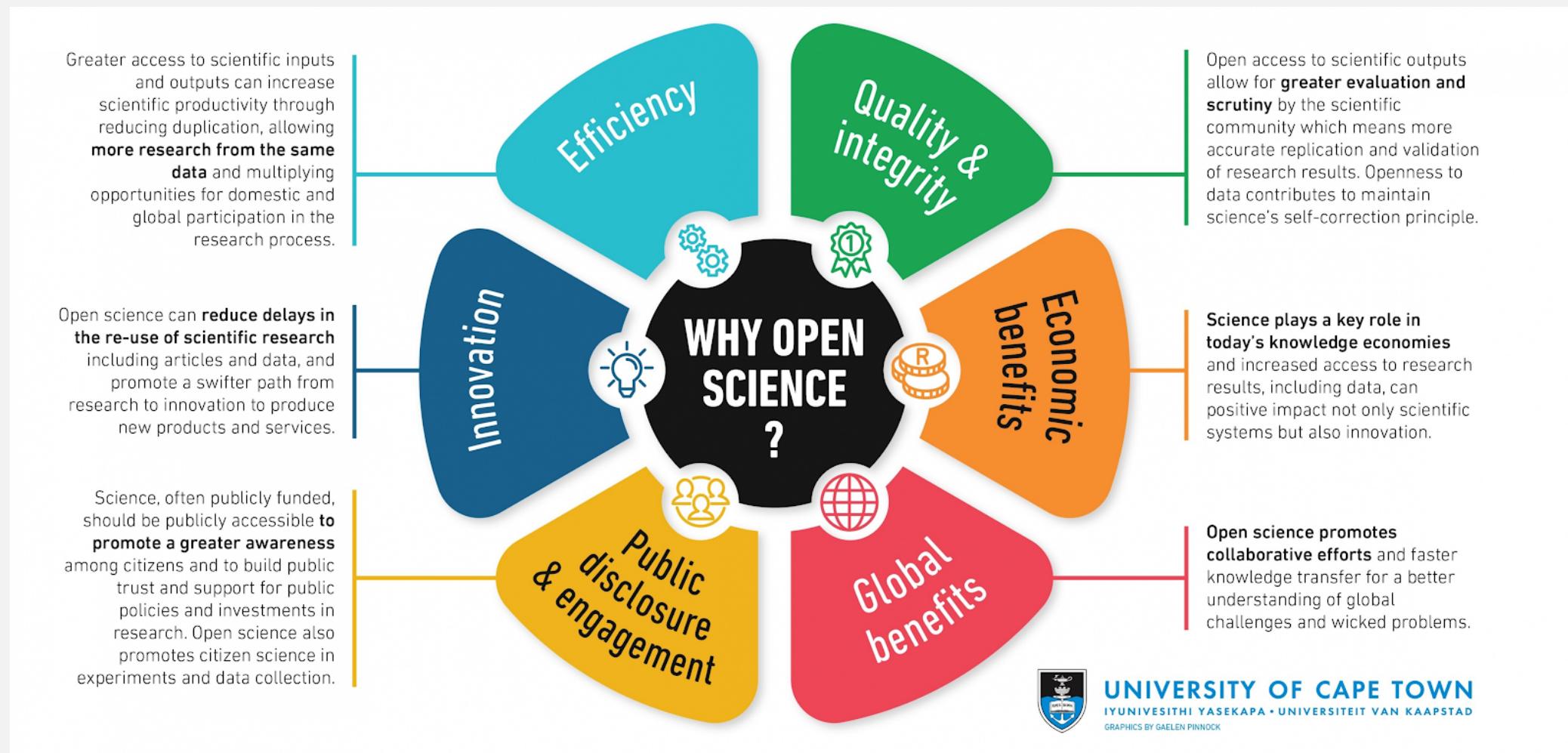


OPEN DISSEMINATION, DISCUSSION AND COLLABORATION

- Accessible research dissemination
- Breaking down existing barriers to participation in science
- Direct discussions (e.g. on Twitter, Research Gate, etc.)



BENEFITS OF OPEN SCIENCE



This image was created by Gealen Pinnock for the Research Support Hub of the University of Cape Town and is licensed under a [Creative Commons Attribution 4.0 International License](#). This image can be found at <http://www.researchsupport.uct.ac.za/why-open-science>. No modifications were made.



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GRAPHICS BY GAELEN PINNOCK



BENEFITS FOR YOU

- Being part of an cooperative global research community
 - Access to feedback, data, code, collaborators, etc. (Allen & Mehler, 2019)
- Great investment in your future (Allen & Mehler, 2019)
 - Science is on the way to being open
 - Open science skills transfer to non-academic careers
- Open access articles receive 18% more citations (Piwowar et al., 2018)
- Greater chance of publishing null findings (Allen & Mehler, 2019)



BARRIERS TO OPEN SCIENCE

“It is an unfortunate irony that open-science practices are not equally accessible to all scientists”

Bahlai et al., 2019, p79-80

- Career stage/job stability
 - Kathawalla et al., 2020: Tips on how to talk to your supervisor about open science
- Systemic inequalities
- Core values over ‘all-or-nothing’ approach



COMING BACK TO OUR GROUP

- Group values/community guidelines
 - No shaming - Open science is not binary, everyone does what they can
 - Collaboration over competition
 - Inclusivity & accountability
 - Mental health
- Community involvement
 - Visitor – Member – Contributor – Organizer
- Hands on challenges



CHALLENGES

- Learn more about it!
 - Check out the resources we've collected and read/watch/listen to something (includes '[A guide to open science for people who are already too busy](#)')
- Talk about it!
 - Ask a question/share something you've recently learned about open science on Slack (#session1)
 - Share and discuss the article by Kathawalla et al. (2020) with your supervisor/lab
- Try it out!
 - [Create an OSF account](#), [set up a project](#) and [upload/organize your files](#) (private/public)
- Implement it!
 - Create an overview of the different open science practices at each stage of a project and place it on/around your desk (use Kathawalla et al., 2020 as starting point)
 - Commit to joining our sessions this semester ([join our slack workspace](#) to stay up to date)



PEOPLE TO CONTACT



Want to present a session? Contact Emiko at ejmuraki@ucalgary.ca or on Slack @Emiko



Have a complaint/bad experience? Contact Jenelle at jenelle.morgan@ucalgary.ca or on Slack @Jenelle Morgan



Other questions/comments? Contact Gwen at gwen.vanderwijk@ucalgary.ca or on Slack @Gwen



ONLINE PLATFORMS

Teams/Sharepoint ([view page](#) – [join group](#)) Run into technical issues? Contact Matt/Michael

- Basic info on our group → sharing

OSF ([view our page](#) – [get started](#))

- Popular platform for open science projects
(cooperation, sharing data/articles)

GitHub ([view our page](#) – [get started](#))

- Sharing code/open source software

Slack ([join our workspace](#) – [get help](#))

- Communication within group



matthew.dawson@ucalgary.ca

@Matt Dawson

Sharepoint/OSF/GitHub

michael.mccarthy@ucalgary.ca

@Michael

Slack/OSF/GitHub



REFERENCES

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RESOURCES

Listen (podcasts):

- Open science talks: [What is open science?](#) (~15 minutes)
- Radiolab: [Stereothreat](#) (~40 min)
- Research Matters: [Embracing an open science mindset](#) (~60 min)
- The black goat: [It's so complicated](#) (~70 min)

Watch (videos):

- Ted Talk about current research culture and open science as a solution: [Research Culture is Broken: Open Science can Fix It](#) (~15 min)
- Lecture on open science: [Open Science is just good science](#) (~40 min)
- Webinar on open science by Brian Nosek, Executive Director and Co-Founder of Center for Open Science (COS): [Open Science](#) (~60 min)



RESOURCES

Read (articles/papers):

- Bahlai, C., Bartlett, L. J., Burgio, K. R., Fournier, A., Keiser, C. N., Poisot, T., & Whitney, K. S. (2019). Open science isn't always open to all scientists. *American Scientist*, 107(2), 78-82.
- Kathawalla, U., Silverstein, P., & Syed, M. (2020, May 8). Easing Into Open Science: A Guide for Graduate Students and Their Advisors. <https://doi.org/10.31234/osf.io/vzjdp>
- Monbiot, G. (2011). Academic publishers make Murdoch look like a socialist. *The Guardian*, 29, 8.
http://wavelets.ens.fr/BOYCOTT_ELSEVIER/ARTICLES/2011_08_29_The_Guardian.pdf
- Blogpost + discussion: [The grad student who never said 'no'](#)

Great overview of more resources presented in a tiered way so you can select what you have time for: [A Guide for Open Science for People Who Are Already Too Busy](#)

More resources, tutorials and step-by-step guides on open science practices: <https://osf.io/w5mbp/wiki/home/>

