

aimos
Association for
Interdisciplinary
Meta-research and
Open Science

AIMOS 2022 Conference Program

28–30 November 2022

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MELBOURNE



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Schedule

All sessions (unless otherwise specified) will be held in the Lyle theatre, ground floor, Redmond Barry building (115), Parkville campus, University of Melbourne (denoted in the schedule below as LT).

Lightning talk abstracts can be found [here](#).

Speaker bios can be found [here](#).

Zoom: <https://unimelb.zoom.us/j/81862772512>
(password emailed to attendees)

Day 1 – Mon. 28th Nov.

Time	Event	Location	Summary
8:30am	Registration Opens		
9:00am	Welcome Matt Page, AIMOS president	LT	
10:00am	Plenary Understanding and Addressing the Generalizability Problem in the Behavioral Sciences Joel Wambua, Patrick Forscher	LT	Patrick and Joel work for the Busara Center for Behavioral Economics in Kenya, a non-profit research and advisory centre that uses behavioral science in service of alleviating poverty. Patrick is a research lead who manages Busara's internal research agenda focused on Culture, Research Ethics, and MMethods (CREME). Joel is a research officer whose work includes design and monitoring of research projects, and managing the primary data analysis processes.
10:30am	Break ☕		
11:00am	Lightning talks. Theme: Quality of research Lee Jones, Bermond Scoggins, Richard	LT	> Lee Jones, Lessons from post-publication statistical reviews > Bermond Scoggins, 'Trust Us': Open Data and Preregistration in Political Science and International Relations > Richard McGee, Retractions in paediatric endocrinology: are we failing to regulate the literature?

	McGee <i>Chair: Jennifer Byrne</i>		See abstracts here .
11:30am	Open Peer review debate Ginny Barbour, Simine Vazire, David Vaux <i>Chair: Daniel Hamilton</i>	LT	Join us for a lively debate, with interactive audience participation, exploring some of the challenges as peer review and publishing becomes more open.
12:00pm	Lightning talks. Theme: Open Science policies Losia Lagisz, Alejandra Mancini, Aidan Tan, Deborah Apthorp <i>Chair: Kathy Zeiler</i>	LT	> Malgorzata Lagisz, What research awards have to do with Open Science? > Alejandra Manco, Open Science Policies seen from the perspective of researchers' communities > Aidan Tan, Prevalence and characteristics of data sharing policies across the health research life cycle: funders, ethics committees, trial registries, journals, and data repositories > Deborah Apthorp, The Data Badge Project - do badges encourage computational reproducibility? See abstracts here.
12:30pm	Lunch!		
<i>(Concurrent Sessions)</i>	Discussion group, Pursuing truth in law and science Jason Chin, Tess Neal, Simine Vazire, Kristy Martire, Alex Holcombe	Oscar Oeser room (1120), Level 11	Both law and science pursue truth and involve formalised exercises in organised distrust. These similarities offer fertile ground for considering how the pursuit of factual accuracy in law and science is impaired by similar forces. For example, in both science and law, transparency prevents organised distrust from working well. In science: researchers can run many statistical tests and select the most favourable results to report; studies that result in null findings are hard to publish; and errors in the published record are challenging to address. In law: it's often hard to know what tests an expert performed and didn't report; swaths of the investigatory process are unreported by police; and multiple experts might be consulted by an adversarial party before one is selected for testimony. These and other similarities offer crucial opportunities for law and science to learn from each other's innovations. In this group, we will discuss these intersections between law and science, with the ultimate aim of producing a research agenda. ZOOM: https://anu.zoom.us/j/87941056958?pwd=Zjd6cjJ5RFd0ZHp0Z2w3eEJmWHJTZz09
1:30 - 3:00pm	Discussion group, Strengthening digital research literacy through interdisciplinary collaboration	Alexander J Wearing room (1123), Level 11	A recent report by RMIT and Deloitte estimates that 87% of jobs require digital skills. In the world of research, the need for digital literacy is even higher, and the skills required are much more sophisticated (for example writing analysis code, using version control, and developing research software). Despite this, most degrees don't explicitly teach these advanced digital skills before students embark on research. This training gap raises several

	Maria del Mar Quiroga, Nic Geard, Simon Mutch, Daniel Russo-Batterham, Kim Doyle		challenges for research institutions: How can they improve digital literacies to enhance research quality and reproducibility? How can they retain digitally skilled researchers, keep up with the latest technologies across all fields, and ensure that their digital infrastructure meets the needs of their researchers? How can they ensure that research practices meet minimum standards of management, governance, ethics, and integrity? ZOOM: https://unimelb.zoom.us/j/89771984275?pwd=MIBsSDZuaml6STZZSlhWaElvdDVJQT09&from=addon
(Concurrent Sessions)	Working paper, Can the Replication Rate Tell Us About Publication Bias? Patrick Vu <i>Chair/discussant:</i> Alex Holcombe	LT	Selective publication is among the most-cited reasons for widespread replication failures. By contrast, I show in a simple model of selective publication that the replication rate is unresponsive to the suppression of insignificant results in the publication process. I then show that the expected replication rate falls below its intended target owing to issues with common power calculations, even in the absence of other factors such as p-hacking or heterogeneous treatment effects. To evaluate the importance of this theoretical result, I estimate an empirical model to produce out-of-sample predictions of the replication rate for large-scale replication studies. Predictions are almost identical to observed replication rates in experimental economics and social science, which suggests that issues with power are sufficient to explain the observed replication rates. In psychology, the model explains two-thirds of the gap between the replication rate and its intended target.
3:00 - 3:45pm			
3:30 - 4:00pm	Lightning Talks Jill Jacobson, Keyana Zahiri, Janaynne Carvalho do Amaral, Dragan Okanovic, Kathleen Schmidt <i>Chair: Matt Page</i>	Latham theatre, ground floor Zoom link here.	> Jill Jacobson (& David J. Hauser), Is participant non-naïveté associated with higher replication rates? > Keyana Zahiri (& Adrienne Mueller), Evaluating Study Design Rigor in Preclinical Cardiovascular Research: A Replication Study > Janaynne Carvalho do Amaral, Patients in peer review: the Research Involvement and Engagement journal initiative > Dragan Okanovic, Creating scientific knowledge graphs with Unfold Research > Kathleen Schmidt, Examining the Generalizability of Psychological Effects <i>See abstracts here.</i>
4:00pm	Mini-note session - Correcting the record Jana Christopher, John Loadsman, Ben Mol, Lisa Parker <i>Chair: Jennifer Byrne</i>	LT	Science is self-correcting, right? In this session, we'll hear from four speakers who will tell us about whether and how science self-corrects, and how this could be done better.
5:30pm	ECR networking event	Johnny's Green Room	All students & early career researchers welcome! There will be some food, drinks & a chance to discuss all things metaresearch.

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Day 2 - Tues. 29th Nov.

Time	Event	Location	Summary
9:00am	Plenary - Thoughts On Replication & Reproducibility In Social Sciences Colin Camerer <i>Chair: Kathy Zeiler</i>	LT	Colin's talk will summarize his opinions about the reproducibility reboot in social science and what simple things can be done. This will include some previous results, predictability of study reproducibility, the role of prediction markets, and why funding agencies & journals are critical gatekeepers.
10:00am	Mini-note panel: Many Analysts Eco Evo Tim Parker, Hannah Fraser, Elliot Gould <i>Chair: Losia Lagisz</i>	LT	To what extent variability in the decisions of individual data analysts drives variability in the results? In this session, we'll hear about a project from the field of ecology and evolution that aims to answer this very question.
11:30am	Break ☕		
12:00pm	Mini-note panel: Credibility underlying decision-making Janet Freilich, Anisa Rowhani-Farid, Barbara Mintzes, Mark Burgman <i>Chair: Jason Chin</i>	LT	Policy makers and others often use empirical findings to guide their decisions. In this session, scholars from the fields of medicine, law and ecology will discuss research projects that assess how well empirical work is utilized in decision making and how we might address challenges.
1:30pm	Lunch!		
<i>(Concurrent Sessions)</i>	Workshop, Beyond the value-free ideal of science Rachael Brown	Oscar Oeser room (1120), Level 11	From Merton's Norm of Distinterestedness to Bacon's Idol of the Tribe, the idea that our best science is "objective" or "value-free" is pervasive. Whilst there is a lot of intuitive appeal to this idea, avoiding values in science is far less straightforward than public discourse suggests and most philosophers of science accept that the influence of values in science (of at least some forms) is unavoidable. Why do they think this? What does it mean for scientific practice? In this workshop, I will use a combination of

2:00 - 3:00pm			dialogue and group exercises to unpack the philosophical discussion around values in science and explore together what we can do to improve our scientific practices in the face of the inevitable influence of values in science.
	Hackathon, Assessing criteria of "best paper" awards across disciplines Malgorzata Lagisz, Yefeng Yang	Alexander J Wearing room (1123), Level 11	Many journals offer "best paper" awards to early career researchers recognising outstanding contributions. Such awards are an opportunity to highlight best research practices. At the same time, they may propagate existing biases in who and what is deemed worthy of recognition. The aim of this hackathon is to evaluate criteria and procedures of a sample of "best paper" awards across disciplines. We will collect data on eligibility rules and transparency of the assessment criteria. We will collect names of the past winners to quantify potential historical gender biases. We will also code which award criteria acknowledge good Open Science practices as something that is valued. As such, we will reveal which journals recognise and reward Open Science practices, fulfilling journals' commitment to promoting robust and transparent science. Results of this survey may help improving existing awards across disciplines, promoting equity, diversity, and inclusivity in academia. To enable broad participation in this hackathon session, we plan to work fully online, using Google Sheets and Forms. Participants' contributions to basic data collection will be acknowledged in the CRediT statement in the resulting outputs, with a potential to earn co-authorship if further significant contributions are made at the later stages of this project. We are asking potential participants to fill in this form so we can get in touch and also learn about your preferences in respect to contributing to this project: https://forms.gle/J3WPWMTAyWJy3k1v9
3:00pm	Lightning talks - Theme: Tools for Open Science Robert Turnbull, Aaron Wilcox, Nic Geard, Alexandra Davidson <i>Chair: Adrian Barnett</i>	LT	> Robert Turnbull, Crunch: A Data Processing Orchestration Tool for Open Science > Aaron Wilcox, DevOps to ResOps: How research software engineers are using DevOps components to aid in computational reproducibility. > Nic Geard, Introduction to the Melbourne Data Analytics Platform (MDAP) > Alexandra Davidson, Taxonomy of interventions at academic institutions to improve research quality See abstracts here.
3:30pm	Mini-note session: The SCORE Project Tim Errington, Martin Bush,	LT	The SCORE program - Systematizing Confidence in Open Research & Evidence - aims to develop and deploy automated tools to assign "confidence scores" to published research in the social & behavioural sciences. SCORE is a research collaboration involving eight research teams. These teams are spread across three distinct areas, including: developing a database of claims

	Thomas Pfeiffer, Sarah Michele Ratmajer <i>Chair: Fiona Fidler</i>		from papers in the social and behavioral sciences; generating human expert and machine generated estimates of credibility; and, evidence of reproducibility, robustness, and replicability to validate the estimates. The data collected from this program will be openly shared and provide an unprecedented opportunity to examine research credibility and evidence. SCORE is funded by DARPA.
5:30pm	Conference social event (off-site)	Hotel Railway, 291 Albert St, Brunswick	Join us at a local venue in Brunswick for some cocktails, mocktails & nibbles. RSVP to aimos-conference@unimelb.edu.au All details will be emailed to in-person attendees.

Day 3 - Wed. 30th Nov.

Time	Event	Location	Summary
9:00am	Plenary - What (Psychology) Researchers Really Want To Know Anne Scheel <i>Chair: Simine Vazire</i>	LT	Anne's talk will present findings that suggest that psychology and neighbouring fields may benefit from a closer look at what purposes hypothesis testing serves in practice and which other methods researchers may need to achieve their goals. Many of the reforms proposed in response to the replication crisis in psychology are designed to make hypothesis tests more rigorous and informative. Researchers are supposed to preregister their hypotheses and analysis plans, formulate more specific and falsifiable predictions, and increase the statistical power of their tests. In theory, these measures merely correct certain lapses that had crept into the widely used hypothesis-testing workflow. In practice, though, many psychologists have surprising difficulty implementing these measures and providing the required specifications and decisions a priori. This disconnect between theory and practice suggests that many research questions do not yet (or not at all) lend themselves to the strict, hypothetico-deductive form of hypothesis testing that some of the recent reforms take for granted. If this is true, higher standards for hypothesis testing will not be sufficient for increasing the knowledge gain of the field at large. Instead, helping psychologists achieve their research goals more effectively and efficiently requires a better understanding of the nature of these research goals in the first place. To further scientific progress, reforms to research practice should take into account what types of questions researchers are asking and what they need to answer them.
10:00am	Mini-note panel: Big Team Science Nicholas Coles, Julia Espinosa, Lene Seidler,	LT	More and more researchers are engaging in big team science, creating grass-roots collaborative networks to tackle difficult research questions. In this session, we'll hear about various big team science projects across different disciplines, the challenges experienced and lessons learnt for future projects.

	Lauren Wool <i>Chair: Alex Holcombe</i>		
11:30am	Break ☕		
12:00pm	Mini-note panel: Metascience origins David Peterson, Fiona Fidler, Nicole Nelson <i>Chair: Fallon Mody</i>	LT	This panel session will explore the different perspectives and processes of understanding the emergence of the field of metaresearch or metascience in historical, philosophical & STS perspectives.
1:30pm	Lunch!		
2:30pm	Lightning talks. Theme: Meta-analyses Phi-Yen Nguyen, James Sotiropoulos, Kylie Hunter, Yefeng Yang	LT	> Phi-Yen Nguyen, Reporting and sharing of review data in systematic reviews between 2014-2020: what changed and what drove these changes > James Sotiropoulos, Developing guidance for outcome harmonisation in prospective meta-analysis > Kylie Hunter, Assessment of data integrity for individual participant data meta-analyses: a case study > Yefeng Yang, Persistent publication bias and low power in ecology and evolution See abstracts here.
(Concurrent Sessions)	Discussion group, Funding for meta-research: what are our options? Adrian Barnett	Alexander J Wearing room (1123), Level 11	Winning research funding in any field is difficult, but there are additional challenges for meta-research as it is a new field that can meet resistance from reviewers. This session will discuss the challenges of winning funding and ideally formulate strategies to help all meta-researchers. We will discuss the ARC and NHMRC, and what schemes might be most appropriate. We will discuss alternative sources, including philanthropy, partnerships with journals/funders, commercial avenues, and direct appeals to government. Previous funding for meta-research has occurred after a major scandal, should we be prepared to exploit the next research integrity scandal in Australia? One approach to broadcast support for meta-research is to create a public list of "Australian scientists who are concerned about research quality", this could be used to lobby for funding and applicants could cite it to support the need for funding. What else can we do as a community to help win funding for meta-research? Please bring your own ideas for a lively discussion. This session aims to be relevant to researchers from all fields and all experience levels.
3:00 - 4:00pm		Latham theatre, ground floor, Redmond Barry building	
	Hackathon, Mapping the landscape of metaresearch communities, Jason Chin, Losia	Oscar Oeser room (1120) Lowe theatre, ground	What are the other meta-research communities beyond AIMOS? What do they do, where do they come from and how they are similar and different? In this hackathon we aim to answer these questions by systematically mapping metaresearch communities and their activities. This hackathon will consist of three types of activities: 1) running searches for relevant communities (we will run preliminary search in English, but need help with other

	Lagisz	floor, Redmond Barry building	languages here!), 2) screening a preliminary list of communities to find those fulfilling our inclusion criteria, and 3) coding characteristics of the included communities. We will use shared Google Forms and Sheets for easy collaboration. Collected data will be used to guide future work and development of AIMOS and potentially some more concrete outputs, such as a blog or manuscript. At this stage, your work will be acknowledged as a contributorship in CRediT format on the AIMOS website and any other outputs. We hope to learn what other researchers are doing in this space and have some fun! Any background and experience level are welcome.
4:00pm	Lightning talks. Theme: Miscellaneous metaresearch Karim Khan, Joshua Wang, Wendy Higgins, Austin Mackell <i>Chair: Martin Bush</i>	LT	> Karim Khan, Improving the quality of consensus methods and consensus statements > Joshua Wang, Corpus linguistics for meta-research: a case study in obesity neuroscience > Wendy Higgins, The myth of the “well-validated” measure > Austin Mackell, Video Bibliographies and Research Transparency See abstracts here.
4:30pm	Mini-note session: Trust in Science Andy Perfors, Mike McGuckin, Sujatha Raman <i>Chair: Simine Vazire</i>	LT	This session will explore themes around public trust in science. What makes science trustworthy? How can science earn the public's trust? How can members of the public evaluate how much trust to put in various scientific claims?
5:30pm	Conference close, Matt Page, AIMOS president	LT	Join Matt Page for some closing remarks on AIMOS2022 and what lies ahead for AIMOS

Lightning talk abstracts

Session 1: Quality of Research (Day 1, 11am)

Lee Jones, Lessons from post-publication statistical reviews

This study contributes to the growing area of meta-research by exploring current statistical practice and identifying common statistical misconceptions and errors researchers make when using linear regression. Statistical practices were assessed in the health and biomedical field by randomly sampling 100 published papers from PLOS ONE in 2019. Forty statisticians were recruited to review the papers, with papers randomly allocated to statisticians ensuring that two independent statisticians rated each paper. Our research shows that the average researcher tends to over-rely on p-values and significance rather than the contextual importance and robustness of conclusions drawn, with an estimated 69% of authors of papers not discussing the scientific importance of parameter estimates and only 23% directly interpreting the size of regression coefficients.

Bermond Scoggins, 'Trust Us': Open Data and Preregistration in Political Science and International Relations

The scientific method is predicated on transparency – yet the pace at which transparent research practices are being adopted by the scientific community is slow. The replication crisis in psychology showed that published findings employing statistical inference are threatened by undetected errors, data manipulation, and data falsification. To mitigate these problems and bolster research credibility, open data and preregistration have increasingly been adopted in the natural and social sciences. While many political science and international relations journals have committed to implementing these reforms, the extent of open science practices is unknown. We bring large-scale text analysis and machine learning classifiers to bear on the question. Using population-level data – 93,931 articles across the top 160 political science and IR journals between 2010 and 2021 – we find that approximately 21% of all statistical inference papers have open data, and 5% of all experiments are preregistered. Despite this shortfall, the example of leading journals in the field shows that change is feasible and can be effected quickly.

Richard McGee, Retractions in paediatric endocrinology: are we failing to regulate the literature?

Aims: The quality of the published literature relies heavily on peer-review. Retractions are another method of managing the evidence base and can be used to deal with fraud, scientific misconduct, and serious errors. We aimed to describe the characteristics and rate of retractions in paediatric endocrinology articles.

Session 2: Open Science Policies (Day 1, 12pm)

Malgorzata Lagisz, What research awards have to do with Open Science?

Alejandra Manco, Open Science Policies seen from the perspective of researchers' communities

Open Science aims to improve research practice, while research awards provide recognition to outstanding researchers for excellent research. But what “excellent research” means? Do assessments of nominated research/researchers consider robustness, transparency, replication, and adherence to other core principles of Open Science? In this talk, I will present results of a project evaluating 11 “best paper” awards and 13 “best researcher” awards from broad-scope international journals and societies in ecology and evolution. We focused on the awards available to early and mid-career researchers and collected data on eligibility rules and assessment criteria. We also coded which awards explicitly value good Open Science practices. The results of this project highlight instances of desirable practices and the lack of such, hopefully nudging award committees to shift away from simple but non-equitable award policies and to promote Open Science values. Finally, I will outline a follow-up project that will be facilitated as

one of the hackathons during AIMOS2022 (the aim of this project is to evaluate criteria and procedures in a sample of “best paper” awards across disciplines, and you are invited to join!).

Aidan Tan, [Prevalence and characteristics of data sharing policies across the health research life cycle: funders, ethics committees, trial registries, journals, and data repositories](#)

One way to reduce the gap between high in-principle support for the concept of data sharing and low in-practice commitment to sharing data is if major stakeholders across the health research life cycle implement policies to recommend or require data sharing. We recently conducted a cross-sectional study to determine the prevalence and characteristics of these data sharing policies. We included the 55 largest private and 55 largest public and philanthropic health research funders by annual health research expenditure, all national ethics committees, all clinical trial registries, the 5 highest impact peer-reviewed scientific journals by Journal Impact Factor for each of the 59 fields of clinical medicine, and all research data repositories in clinical medicine. We assessed all official websites, online reports and grey literature information sources of stakeholders for the presence of a data sharing policy and, if present, its magnitude of support for data sharing. We included 110 funders, 124 ethics committees, 18 trial registries, 273 journals, and 410 data repositories. We found that data sharing imperatives were not met by most stakeholders, and we propose a lightning talk to discuss our results in detail and their implications for multidisciplinary meta-research and open science.

Deborah Apthorp, [The Data Badge Project - do badges encourage computational reproducibility?](#)

In April 2019, the journal Psychological Science published its first issue in which all of the (14) research articles received an "Open Data" badge. Not long after this, open science advocate Nick Brown issued a call-out on Twitter for anyone interested in joining a team project to attempt independent reproductions of each article. I enthusiastically signed up on the spot, and was part of a final team of 12 researchers who attempted, with varying success, to reproduce the published results. Each article had at least three independent attempts at reproduction, after which the teams each convened via Google Groups to compile a group report. From these, we summarised our findings in a single paper, which has now been accepted at Psychological Science. Overall, Only six of the fourteen articles provided analysis code, and only one could be exactly reproduced, with three more essentially reproducible with minor deviations. I will discuss my experience in being part of this team, the issues we encountered, and our recommendations for improving computational reproducibility.

Session 3: Pre-recorded lightning talks (Day 1, 3:30pm)

Jill Jacobson (& David J. Hauser), [Is participant non-naïveté associated with higher replication rates?](#)

In the Reproducibility Project: Psychology (RPP; Open Science Collaboration, 2015), cognitive psychology studies had higher replication rates than did social psychology studies. These two areas differ in the amount of information provided to participants before the experiment. Cognitive psychologists often tell participants their hypotheses, whereas social psychologists generally use cover stories to obscure their goals. As a result, the areas also differ in participant prospection or non-naïveté (i.e., the likelihood or ease of determining a study's purpose or at least how the researcher expects participants to respond), which could influence participants' responses yielding differences in replicability. To shed light on the relationship between non-naïveté (via the amount of pre-study information provided) and replication rates, we coded each RPP study on how much detail the consent form, initial instructions, and stimuli provided about the study's true purpose and the expected results. We examined the relationship between our prospection ratings and three different indicators of replication success: p value was less than .05 in the replication, the original effect size fell within the replication's confidence interval, and the meta-analytic effect size did not equal 0. The results differed depending on the definition of replication success and where the information was presented.

Keyana Zahiri (& Adrienne Mueller), Evaluating Study Design Rigor in Preclinical Cardiovascular Research: A Replication Study

Preclinical studies using animal models play a key role in evaluating the safety and efficacy of novel therapies and optimizing patient care. They are also important for our understanding of heart disease. Yet, we often find failed translations from “bench-to-bedside” and methodological rigor remains a major priority to maintain a level of consistent reproducibility across preclinical research. One means to enhance reproducibility is to increase the robustness of study design elements (SDEs)—randomization, sample size estimation, blinding, and sex as a biological variable. Here, we evaluated the implementation of SDEs in preclinical cardiovascular studies. Randomly selected papers from a database of research articles published in the top biomedical and science journals (e.g. Nature, Cell, etc.) from 2011-2021 were systematically screened. This is a replication study of Ramirez et al., 2017, in preclinical studies published outside of the five cardiovascular journals used in that study. This study also compares rigor in studies that have human and animal experiments and those which have animal-only experiments. By identifying the trends in sex of study subjects used, randomization, blinding, and sample size estimations, we assessed the rigor of scientific practices carried out in preclinical cardiovascular research.

Janayne Carvalho do Amaral, Patients in peer review: the Research Involvement and Engagement journal initiative

Scientific journals disseminate content produced, edited, and evaluated by researchers. However, open science initiatives such as open access, citizen science, and open peer review are expanding the role of peer-reviewed journals. This work describes the methodology used by the journal Research Involvement and Engagement, launched in 2015, to engage patients and the public in the peer review process. To describe the role of the new types of reviewers, we collected from the journal’s website its Aims and Scope, Reviewer Guidelines, and Peer Review Policy. The results showed that journal’s Reviewer Guidelines are the main tool for engaging patients and the public in the peer review process. Exactly as academic reviewers do, patient reviewers may evaluate manuscripts based on their experiences and background, addressing the research methodology, the importance and relevance of the research, or even whether a treatment or intervention is acceptable to them. Finally, the strategies of Research Involvement and Engagement to engage patients and the public in scientific journals may help to build a bridge between scientists and society, turning journals into tools for public engagement in science. In addition, as a consequence, patients and the public may impact the way researchers do, evaluate, communicate, and publish research results.

Dragan Okanovic, Creating scientific knowledge graphs with Unfold Research

This talk is about using Unfold Research browser extension to link different research outputs together. It will cover the basic functionality of the app such as voting, collections, notifications and we will see how to use it to enable things like an open review system, to share materials for conferences that everyone can find easily, or how to backlink your new projects with existing research.

Kathleen Schmidt, Examining the Generalizability of Psychological Effects

The Psychological Science Accelerator (PSA) is seeking collaborators for a series of studies funded by the John Templeton Foundation (JTF). The goal of this project is to provide generalizable answers to research questions relevant to JTF strategic priorities, such as intellectual humility, religious cognition, and character virtue. The four studies selected will investigate psychological phenomena within these topic areas across university and community samples around the globe. Selected studies will also be included in an overarching metascientific investigation examining researcher accuracy in predicting generalizability. This talk will summarize the project aims and invite study proposals and other contributions from researchers across disciplines and career stages.

Session 4: Tools for Open Science (Day 2, 3pm)

Robert Turnbull, Crunch: A Data Processing Orchestration Tool for Open Science

Modern data processing pipelines can involve a complex array of stages employing independent software packages. Running stages of such a pipeline manually impedes reproducibility because the steps could be completed in different ways or in a different order. This problem is exacerbated when dealing with a large array of datasets that need to be processed with the identical steps. Data processing workflow tools such as the Workflow Description Language (WDL) or Snakemake allow for pipelines to be explicitly defined and published to allow others to reproduce the exact steps that were undertaken. But what if the number of datasets cannot all fit onto the storage available on the computational infrastructure? Copying each datasets and uploading the results manually is a laborious process and liable to error. We present Crunch, an open-source tool to automate processing an array of datasets by copying each dataset from a storage facility to the location of the computation, processing the workflow, uploading the results and recording the diagnostics in a web-based database. The progress of the pipeline through the datasets can be monitored and controlled through the web-based portal. The processed results can be made available for open-access publication through this portal.

Aaron Wilcox, DevOps to ResOps: How research software engineers are using DevOps components to aid in computational reproducibility.

Given the increasing demand for reproducible workflows, the growing number of computational tools available and increasing data availability within science, we argue that scientists who develop code and software as a part of their research would benefit from adopting DevOps practices into their scientific toolbox. There are, however, some important differences between code and software development in service of science, and that of software engineering settings. Moreover, code and software development in scientific contexts is often done by researchers who first learn to program solo, and are usually self-taught on the fly, without any formal learning about the importance of project management for software development and collaborative code development practices for reproducible research. We translate DevOps into ResOps and provide a guide for scientists to modernize their code development practices. ResOps will make the lives of researchers easier when developing analysis code and scientific software and will aid scientific research in becoming more reproducible should these best practices be adopted.

Nic Geard, Introduction to the Melbourne Data Analytics Platform (MDAP)

Recognising the growing importance of digital research, the University of Melbourne established the Melbourne Data Analytics Platform (MDAP) in 2019 to support researchers, particularly in disciplines looking to grow digital research capability.

MDAP has since grown to around twenty research data specialists with diverse backgrounds and expertise in data stewardship, analysis, visualisation, cloud and high-performance computing, and related areas. MDAP has enabled innovative data-intensive research across the University, engaging in more than fifty trans-disciplinary research collaborations over the past four years. In addition, it has supported researchers from all University faculties via expert consultation, delivery of targeted training, and community building activities.

The success of MDAP is evidenced not only by the grant funding, publications, code libraries, and datasets produced by its research collaborations, but also by the increased digital literacy of researchers across the University. Throughout its development, MDAP has set a new standard for an academic specialist workforce at the University, inspiring other institutions to consider similar approaches.

In this presentation, I will provide some background on the creation, vision, and principles of MDAP, and set the scene for a broader discussion on strengthening digital research literacy through interdisciplinary collaboration.

Alexandra Davidson, Taxonomy of interventions at academic institutions to improve research quality

In this presentation, we will describe how we developed a taxonomy that classifies possible interventions to improve research quality, reduce waste and reproducibility within research-performing institutions.

Key interventions should focus on those with the largest impact for the least cost to the institution, and further evaluation of the impact of interventions is needed.

Session 5: Meta-analyses (Day 3, 2:30pm)

Phi-Yen Nguyen, Reporting and sharing of review data in systematic reviews between 2014-2020: what changed and what drove these changes

This meta-research study examined changes in patterns of reporting and sharing data, analytic code and other review materials in systematic reviews (SRs) over time; and factors associated with these changes. A random sample of 300 SRs, which were indexed in November 2020 in five databases, were compared with 110 SRs indexed in February 2014. Associations between completeness of reporting and various factors (e.g. self-reported use of reporting guidelines, journal's data sharing policies) were examined by calculating risk ratios (RR) and 95% confidence intervals (CI). Several items were reported sub-optimally among 300 SRs from 2020, such as a registration record (38%), methods used to prepare data for meta-analysis (34%), or heterogeneity variance estimator used (21%). Only a few items not already reported at a high frequency in 2014 were reported more frequently in 2020. There was no evidence that reviews using a reporting guideline were more completely reported than reviews not using a guideline. Reviews published in 2020 in journals that mandated either data sharing or inclusion of Data Availability Statements were more likely to share their review materials (e.g. data, code files) (18% vs 2%). Our findings suggest that incomplete reporting of several recommended items for systematic reviews persists, even in reviews that claim to have followed a reporting guideline; and that data sharing policies of journals potentially encourage sharing of review materials.

James Sotiropoulos, Developing guidance for outcome harmonisation in prospective meta-analysis

Background

Outcome harmonisation is the process of standardising outcomes collected across similar trials, so they can be synthesised more easily. It is a key advantage of prospective meta-analysis (PMA), however, limited guidance exists.

Aims

To develop guidance for outcome harmonisation of ongoing studies eligible for a PMA.

Methods

Guidance was derived from the literature and expert consultation and applied to our case study, the PROspective Meta-analysis Of Initial Oxygen in preterm Newborns (PROMOTION) study. Key recommendations were summarised, and their successful application in PROMOTION was assessed.

Results

Outcomes were mapped and harmonized on four levels (1) outcome definition, (2) specific measurement tool, (3) time point, and (4) method of aggregation. Several harmonisation strategies were identified and employed to address outcome discordance. These included reviewing core outcome sets, creating standardised definitions of outcomes and outcome measures, and consulting trialists and data managers. In our case study, all discordant outcomes were able to be harmonised using these harmonisation strategies.

Discussion

We developed strategies to improve outcome harmonisation and demonstrate them in a case study. Appropriate outcome harmonisation maximises the utility of data collected by trials and reduces research waste by minimising the number of participants required to achieve sufficient statistical power.

Kylie Hunter, Assessment of data integrity for individual participant data meta-analyses: a case study

Background

Concerns about the trustworthiness of research are increasing. This has prompted development of checklists to assess integrity of studies before inclusion in systematic reviews of aggregate data from publications. Individual participant data meta-analyses (IPD-MA) involve collecting raw data for each

participant. This enables more comprehensive integrity checks, but there is limited guidance on how to conduct these.

Aim

To develop an IPD-MA integrity tool, and test this in a large IPD-MA of cord clamping in preterm infants.

Methods

We conducted a literature review to collate and map existing data integrity items. These were grouped into key themes and refined by discussion among an expert advisory group. Agreed items were included in a standardised tool. Where possible, checks were automated using R Markdown. We double-screened each study in our IPD-MA using this tool.

Results

We developed an IPD-MA integrity tool comprising eight core items, e.g. checking for unusual data patterns. In our case study, potential integrity issues were identified for ~90% of 61 studies contributing IPD. Most were resolved via consultation; three studies were excluded.

Discussion

The quality of IPD-MA relies on inclusion of trustworthy data. We developed a tool to assess trustworthiness, which we continue to pilot and refine.

Yefeng Yang, Persistent publication bias and low power in ecology and evolution

Collaborative assessments of direct replicability of empirical studies in the medical and social sciences have exposed alarmingly low rates of replicability, a phenomenon dubbed the 'replication crisis'. However, no equivalent replication projects in ecology and evolutionary biology. But two inter-related indicators offer us the possibility to retrospectively assess replicability: publication bias and statistical power. Recently, my team had a registered report assessing the prevalence and severity of publication bias and how publication bias might distort the estimation of effect sizes, statistical power, and errors in magnitude and sign. In this Lightning Talk session, I will talk about our main findings: there is strong evidence for the pervasiveness of both small-study and decline effects in ecology and evolution. The prevalence of publication bias distorted confidence in meta-analytic results with 66% of initially statistically significant meta-analytic means becoming non-significant after correcting for publication bias. Primary studies consistently had a low statistical power (15%) with a 4-fold exaggeration of effects on average. These findings call for the importance of designing high-power empirical studies (e.g., via collaborative team science), promoting and encouraging replication studies, and embracing open and transparent research practices, such as (pre)registration, data- and code-sharing, and transparent reporting.

Session 6: Miscellaneous meta-research (Day 3, 4pm)

Karim Khan, Improving the quality of consensus methods and consensus statements

I'm a Professor at the University of British Columbia in Vancouver and the Scientific Director of one of Canada's 13 Health Research Institutes (CIHR-IMHA--the one that addresses musculoskeletal conditions and arthritis). I was Editor in Chief of one of the BMJ Group journals for 13 years (Br J Sports Med). I have published on peer-review and I have been part of 13 consensus statement author groups--and the process can be improved.

In a 5-minute talk I would draw attention to the issue of consensus methods/consensus statements and link with folks who are interested in this topic. There are at least 4 elements that are often not considered and I'd outline 4 solutions. These include not having a clear focused question/purpose for the consensus process (too ambitious), not focusing the systematic review/background material, not choosing the right type of consensus method and not deciding on the balance between expertise and inclusivity in the consensus group.

My talk is new and extends the published paper by co-author and Master's student Mr Paul Blazey and Dr Clare Ardern among others: <https://pubmed.ncbi.nlm.nih.gov/34556467/>

Joshua Wang, Corpus linguistics for meta-research: a case study in obesity neuroscience

Corpus linguistics is a discipline concerned with the quantitative linguistic analyses of large collections of text data, called corpora. These analyses provide a repeatable method for identifying broad trends in a given genre of writing that a corpus represents (McEnery & Brezina, 2022). For example, the British National Corpus is used to identify trends in both written and spoken language amongst the British public. Corpus linguistics is also commonly deployed in language-learning contexts (Lei & Liu, 2016). However, the use of corpus linguistics as a tool to aid meta-research investigations remains under-appreciated (Wang et al., 2022).

This presentation provides one of the first analyses of a corpus of full-text journal articles. The Neuroobesity corpus consists of 200 open-access obesity-related articles from neuroscience journals with the largest Altmetric scores for engagement. The corpus has been analysed in the open-source software #lancsbox v.6.0 (Brezina et al., 2015, 2020) to identify the predominate ways in which influential neuroscience research frames obesity pathogenesis. Major findings will be presented to highlight the power of corpus linguistics as a meta-research tool, as well as provide broader methodological insights from this novel method application.

Brezina, V., McEnery, T., & Wattam, S. (2015). Collocations in context: A new perspective on collocation networks. *International Journal of Corpus Linguistics*, 20(2), 139–173. <https://doi.org/10.1075/ijcl.20.2.01bre>

Brezina, V., Weill-Tessier, P., & McEnery, A. (2020). #lancsBox v.6.0 [software].

<http://corpora.lancs.ac.uk/lancsbox>

Lei, L., & Liu, D. (2016). A new medical academic word list: A corpus-based study with enhanced methodology. *Journal of English for Academic Purposes*, 22, 42–53.

<https://doi.org/10.1016/j.jeap.2016.01.008>

McEnery, T., & Brezina, V. (2022). *Fundamental Principles of Corpus Linguistics*. Cambridge University Press.

Wang, G., Wang, H., & Wang, L. (2022). Research trends in tourism and hospitality from 1991 to 2020: An integrated approach of corpus linguistics and bibliometrics. *Journal of Hospitality and Tourism Insights* (ahead-of-print). <https://doi.org/10.1108/JHTI-09-2021-0260>

Wendy Higgins, The myth of the “well-validated” measure

The Reading the Mind in the Eyes Test (RMET) is one of the most widely used measures of social cognition in the psychological sciences. It is routinely claimed that the RMET is “well-validated”. However, in this talk I summarise preliminary findings from my scoping review of over 1,600 published RMET studies which demonstrates that there is remarkably little evidence that this measure is valid. Additionally, I present results from a recently published empirical study that provides evidence against the validity of the RMET. I urge the scientific community to consider the possibility that not all widely-used and purportedly “well-validated” measures are backed by acceptable validity evidence.

Austin Mackell, Video Bibliographies and Research Transparency

The Video Bibliography is a new, streamlined and comprehensive system for capturing the methodology and evidence behind knowledge claims across academia, journalism and other areas. By practicing radical transparency and allowing the end users to ride along, so to speak, during the knowledge creation process we can bring open-source thinking into our research practice. Here's a recent example of the tool at work in the context of a blog post: <https://austingmackell.medium.com/why-renting-makes-sense-right-now-even-if-you-can-afford-to-buy-651294706977>

Speakers bios

A	Deborah Apthorp	B	Adrian Barnett Rachael Brown Mark Burgman	C	Colin Camerer Janaynne Carvalho do Amaral Jason Chin Jana Christopher Nicholas Coles Sophia Cruwell
D	Alexandra Davidson Kim Doyle	E	Tim Errington Julia Espinosa	F	Patrick Forscher Fiona Fidler Hannah Fraser Janet Freilich
G	Nic Geard Elliot Gould	H	David J. Hauser Wendy Higgins Kylie Hunter Alex Holcombe	I	
J	Jill Jacobson Lee Jones	K	Karim Khan	L	Malgorzata Lagisz (Losia) John Loadman
M	Austin Mackell Richard McGee Mike McGuckin Barbara Mintzes Ben Mol Alejandra Manco Adrienne Mueller Simon Mutch	N	Tess Neal Nicole Nelson Phoebe Nguyen	O	Dragan Okan
P	Lisa Parker Tim Parker Andrew Perfors David Peterson Thomas Pfeiffer	Q	Mar Quiroga	R	Sarah Raitmajer Sujatha Raman Joshua Wang Anisa Rowhani-Farid Daniel Russo-Batterham
S	Anne Scheel Kathleen Schmidt Bermond Scoggins Anna Lene Seidler (Lene) James Sotiropoulos	T	Aidan Tan Robert Turnbull	U	
V	Dimitris Vagenas Simine Vazire Patrick Vu	W	Joel Mumo Wambua Belinda Weaver Aaron Willcox Lauren Wool	X	
Y	Yefeng Yang	Z	Keyana Zahiri		

Patrick Forscher

Bio

Patrick is a metaresearcher whose work is focused on making behavioral science more robust, useful, and fair. Patrick works as a Research Lead for the Busara Center for Behavioral Economics in Kenya, a non-profit research and advisory centre that uses behavioral science in service of alleviating poverty, where he manages Busara's internal research agenda focused on Culture, Research Ethics, and MEthods (CREME). Prior to Busara, Patrick served as a research scientist at Université Grenoble Alpes, Funding Lead at the Psychological Science Accelerator, and an Assistant Professor at the University of Arkansas.

Title of presentation

Generalizability Of Research Claims In The Global South (Plenary)



Joel Mumo Wambua

Bio

Joel Wambua is a Research Specialist at Busara Center for Behavioral Economics. At Busara, he leads an agenda on ethical research. The main objective of this agenda is to conduct empirical research into the preferences of research participants, close feedback loops, and strengthen participant voices. Joel's research interests lie in applied behavioral science, specifically on questions relating to economic development, public policy, reproducibility, and research ethics. Joel has a background in Economics and Sociology.

Title of presentation

Generalizability Of Research Claims In The Global South (Plenary)
Feedback and accountability for meaningful development

Short description of presentation (Feedback and accountability for meaningful development)

The principle that underpins ethical research is that it is positive for the participants, non-extractive, respectful, and conducted in line with participants' values. In this session, we will share our framework for finding better ways of closing the loop in communication with participants and upholding ever-higher standards of ethical practice.



Colin Camerer

Bio

Colin is a professor of behavioral economist at Caltech. Colin's research imports methods from psychology and neuroscience to improve economics. Colin's science team is interested in a range of decisions, games, and markets and uses eyetracking, lesion patients, EEG, fMRI, wearable sensors, machine learning, and animal behavior. Two major application areas are financial behavior and strategic thinking in games.

Title of presentation

Thoughts on Replication & Reproducibility in Social Sciences (Plenary)



Anne Scheel

Bio

Anne is an incoming assistant professor in methodology and statistics at Utrecht University. Anne completed her PhD at TU Eindhoven and worked as a postdoctoral researcher at VU Amsterdam and at the Centre for Science and Technology Studies, Leiden. With a background in psychology and meta-psychology, Anne has studied reforms of research and publication practices in psychology as part of the discipline's effort to recover from the replication crisis and improve the reliability and efficiency of published research.

Title of presentation

What (Psychology) Researchers Really Want to Know



Phoebe Nguyen

Bio

Phoebe Nguyen is a PhD student at the Methods in Evidence Synthesis Unit at Monash University. Her PhD project investigates reporting biases in interrupted time series.

Title of presentation

Reporting of methods and results in systematic reviews: what has changed in 5 years and what works

Short description of presentation

In this presentation, we will share the latest findings from the REPRISE project, in which systematic reviews published in 2014 and 2020 were compared on several measures of reporting completeness, and frequency of sharing data, code and other materials required to validate or replicate the review. We also investigated which factors (e.g. citation of a reporting guideline, data sharing policy of the corresponding journal) influence the trends observed.



Adrienne Mueller**Bio**

Adrienne Mueller is the Associate Director for Scientific Education and Outreach at the Stanford Cardiovascular Institute. She runs research training programs for undergraduate and postdoctoral scientists, including an initiative for teams of trainees to complete meta-science research projects. Prior to her current role, she completed a postdoc in the field of cognitive neuroscience at Stanford University and received her PhD in Neurobiology and Behavior from the University of Washington.

Title of presentation

Evaluating Study Design Rigor in Preclinical Cardiovascular Research: A Replication Study

Short description of presentation

Preclinical studies using animal models play an important role in evaluating the safety and efficacy of novel therapies and optimizing patient care. By identifying the trends in inclusion of key study design elements, we assessed the rigor of scientific practices carried out in preclinical cardiovascular research.



Alejandra Manco

Bio

PhD candidate in information and communication sciences at Lyon 1 University, part of the research team ELICO (EA 4147). Master in digital media at the University of Uppsala. Professional experience as editor and as consultant in information and knowledge management in international organizations.

Title of presentation

Open Science Policies seen from the perspective of researchers' communities

Short description of presentation

This presentation examines the opinions, attitudes, and experiences of researchers from Brazil and Peru. It also intends to provide a wide picture of how scientific communities—physicists, chemists, and biologists—perceive open science policies, including their opinions on the subject, as well as whether any modifications have been made to their knowledge production processes.



David J. Hauser

Bio

Dave Hauser studies judgement/social cognition, namely how communication guides our inferences, preferences, and reasoning. He is an Assistant Professor of Social/Personality Psychology at Queen's University in Kingston, Ontario. Before that, he was a Postdoctoral Research Associate at the Dornsife Mind and Society Center at the University of Southern California. He earned his Ph.D. in Social Psychology at the University of Michigan.

Title of presentation

Is participant non-naïveté associated with higher replication rates?

Short description of presentation

To shed light on the relationship between participant non-naïveté (via the amount of pre-study information provided) and replication rates, we coded each Reproducibility Project:Psychology study on how much detail was provided about the study's true purpose in the consent form and other materials. The results differed depending on the definition of replication success (e.g., p values, confidence intervals, meta-analytic effect size) and where the information was presented.



Aaron Willcox

Bio

Aaron Willcox is a research software engineer with an in depth experience in creating technical solutions for data management pipelines that aid computational reproducibility. After transitioning from a career in managing technical productions he completed a degree in Psychological Science at Deakin University before spending the next 3 years as a Research Fellow in Data Science with the repliCATS team. During this project he worked collaboratively using tools such as RStudio and Docker to create data pipelines to aggregate over 4000 scientific claims from the social and behavioural sciences.

Title of presentation

DevOps to ResOps: How research software engineers are using DevOps components to aid in computational reproducibility.

Short description of presentation

Given the increasing demand for reproducible workflows, the growing number of computational tools available and increasing data availability within science, we argue that scientists who develop code and software as a part of their research would benefit from adopting DevOps practices into their scientific toolbelt. There are, however, some important differences between code and software development in service of science, and that of software engineering settings. Moreover, code and software development in scientific contexts is often done by researchers who first learn to program solo, and are usually self-taught on the fly, without any formal learning about the importance of project management for software development and collaborative code development practices for reproducible research. We translate DevOps into ResOps and provide a guide for scientists to modernize their code development practices. ResOps will make the lives of researchers easier when developing analysis code and scientific software and will aid scientific research in becoming more reproducible should these best practices be adopted.



Dragan Okanovic

Bio

Dragan Okanovic is the founder of Unfold Research, a metascientific web platform. As a software developer, he has spent years building products for academia and finding better ways for people to collaborate. He also has a keen interest in consciousness research.

Title of presentation

Creating scientific knowledge graphs with Unfold Research

Short description of presentation

This talk is about using Unfold Research browser extension to link different research outputs together. It will cover the basic functionality of the app such as voting, collections, notifications and we will see how to use it to enable things like an open review system, to share materials for conferences that everyone can find easily, or how to backlink your new projects with existing research.



Austin Mackell

Bio

Austin Mackell was a philosophy student on exchange in Lebanon when the 2006 war broke out. He started covering the war and then spent the next ten years working as a journalist, including from Egypt during the Arab Spring. In 2017 he founded Stone Transparency, which last year released an open beta of its research transparency platform, which creates video-bibliographies allowing journalists and other knowledge creators to seamlessly capture and share their research processes using video.

Title of presentation

Video Bibliographies and Research Transparency

Short description of presentation

Using video as a tool for research capture changes the epistemological landscape, unlocking the potential of Video Derived Research Metrics to provide the foundations of a quantitative matrix of values relating to research effort, quality and integrity. The talk will include a short demonstration of our original research capture software.



Jill Jacobson

Bio

Jill A. Jacobson, Ph.D., an associate professor at Queen's University, Canada, did her graduate work in social-personality and quantitative psychology at The Ohio State University and a post-doc at the University of California, Irvine. She has been conducting research for nearly 30 years mostly on the moderating role of individual differences, particularly subclinical depression and related constructs like uncertainty and self-esteem, in social cognition and behavior. Her teaching over the last 21 years at Queen's has been almost exclusively courses on research methods and statistics for which she has won four teaching awards.

Title of presentation

Is participant non-naïveté associated with higher replication rates?

Short description of presentation

To shed light on the relationship between participant non-naïveté (via the amount of pre-study information provided) and replication rates, we coded each Reproducibility Project:Psychology study on how much detail was provided about the study's true purpose in the consent form and other materials. The results differed depending on the definition of replication success (e.g., p values, confidence intervals, meta-analytic effect size) and where the information was presented.



Joshua Wang

Bio

Josh is a final-year PhD candidate and STEM Educator at the Queensland University of Technology. He is a Fellow of the Higher Education Academy and researchers how scholarly publishing can be better utilised to develop scientific literacy in undergraduate students. His doctoral project explores the neuroscience of obesity, and how this research field shapes public perceptions of fat people. He has a keen interest in how meta-research can inform and shape academic ethics.

Title of presentation

Corpus linguistics for meta-research: a case study in obesity neuroscience

Short description of presentation

Corpus linguistics can quantitatively analyse large collections of text data, yet this method is underutilised in analysing corpora of scholarly literature. An example project is presented in which corpus linguistics has been used to answer a meta-research research question.



Keyana Zahiri

Bio

Keyana Zahiri is a senior undergraduate student at Brown University in Providence, Rhode Island studying Health & Human Biology and Cognitive Neuroscience in the Program in Liberal Medical Education (PLME). Next year, she will be attending medical school at the Warren Alpert Medical School of Brown University and is interested in pursuing Cardiac Surgery. Keyana is involved with clinical and cardiac tissue engineering research at Brown and with cardiovascular metareserach and artificial intelligence work at the Stanford Cardiovascular Institute.

Title of presentation

Evaluating Study Design Rigor in Preclinical Cardiovascular Research: A Replication Study

Short description of presentation

Preclinical studies using animal models play an important role in evaluating the safety and efficacy of novel therapies and optimizing patient care. By identifying the trends in inclusion of key study design elements, we assessed the rigor of scientific practices carried out in preclinical cardiovascular research.



Lee Jones**Bio**

Lee is an accredited statistician (AStat) and past president of the Statistical Society of Australia Queensland branch. She is a biostatistician at QIMR Berghofer Medical Research Institute and completing a PhD in Meta-Research focusing on statistical quality and reproducibility in health research at QUT. She contributes to a broad range of projects with strengths, including cancer research, clinical trials, and quality improvement, and has successfully gained over \$12 million in funding throughout her career.

Title of presentation

Lessons from post-publication statistical reviews

Short description of presentation

This research focuses on reviewing current statistical practices and identifies common statistical misconceptions made by health researchers when using linear regression. Results from our random sample of 100 PLOS ONE papers indicate that most authors poorly reported statistical analysis. Recommendations for improving this interpretation gap include teaching statistics holistically, where most statistics can be seen in a regression framework rather than a series of unconnected tests.



Nic Geard**Bio**

Nic Geard is Director of the Melbourne Data Analytics Program, and an Associate Professor with the School of Computing and Information Systems at the University of Melbourne, with expertise in computational modelling and simulation. As a member of the Doherty modelling group, he contributes advice on public health policy to around preparedness and response to COVID-19 and other pathogens. He is passionate about interdisciplinary and socially relevant research and enjoys collaborating with domain experts across a range of domains including epidemiology, public health, ecology, and sociology.

Title of presentation

Strengthening digital research literacy through interdisciplinary collaboration

Short description of presentation

In this session we will discuss the challenges involved in strengthening digital literacy in the research community, and how the Melbourne Data Analytics Platform at The University of Melbourne is attempting to tackle some of these through interdisciplinary research.



Kim Doyle

Bio

Kim Doyle is a Research Data Specialist at the Melbourne Data Analytics Platform (MDAP) and a PhD in Media and Communications at the University of Melbourne. Previously, she taught natural language processing and data mining to researchers at the University of Melbourne's Research Platform Services at the for a number of years. Her research interests include political communication, social media and computational social science.

Title of presentation

Strengthening digital research literacy through interdisciplinary collaboration

Short description of presentation

In this session we will discuss the challenges involved in strengthening digital literacy in the research community, and how the Melbourne Data Analytics Platform at The University of Melbourne is attempting to tackle some of these through interdisciplinary research.



Daniel Russo-Batterham**Bio**

In April 2018, Dr Daniel Russo-Batterham graduated from his PhD at the University of Melbourne where he used computational methods to examine seventeenth-century lute songs, with a particular focus on the relationship between text and music. Since graduating, Daniel has worked on Digital Humanities projects across Australia and abroad. He has a background in python, data wrangling, relational database design, web scraping, quantitative methods, natural language processing, and a broad range of approaches to visualisation.

Title of presentation

Strengthening digital research literacy through interdisciplinary collaboration

Short description of presentation

In this session we will discuss the challenges involved in strengthening digital literacy in the research community, and how the Melbourne Data Analytics Platform at The University of Melbourne is attempting to tackle some of these through interdisciplinary research.



Andrew Perfors

Bio

Andrew Perfors is an Associate Professor and Director of the Complex Human Data Hub at the University of Melbourne School of Psychological Sciences, where he runs the Computational Cognitive Science Lab. His research focuses on quantitative approaches to higher-order cognition: concepts; language; decision-making; information and misinformation transmission; and cultural and social evolution and change. He also teaches the undergraduate research methods subject in psychology and through it has shown thousands of students (who were initially afraid of R, coding, and statistics) that they can enjoy quantitative research in R and be good at it! Andy's passions include good data practices, especially data visualisation, not just for science communication but also as a key part of the scientific process itself. He has also thought a lot about science as a kind of information system, and thus how insights about how to design and shape effective and trustworthy information systems might apply to science itself.

Title of presentation

Science as an information system: How can we know when to trust?

Short description of presentation

I'll be talking about an abstract framework for thinking about information systems in general and identifying the factors that lead to trustworthiness (of the system as well as the specific information). Then I'll discuss how this maps onto the situation we are faced with as scientists, who are embedded in the very system we wish to shape.



Rachael Brown

Bio

Rachael is a Senior Lecturer and Director of the Centre for Philosophy of the Sciences in the School of Philosophy at the Australian National University. She is a philosopher of biology with a particular interest in the concept of evolvability and the role of learning in evolution.

Title of presentation

Beyond the value-free ideal of science

Short description of presentation

Whilst the idea that our best science is "objective" or "value-free" is intuitively appealing, it has been thoroughly debunked by philosophers of science. The influence of at least some form of values in science is, it is claimed, unavoidable. In this workshop we will explore the reasons why values cannot be avoided in science and explore how to reconcile this with the metascience project of improving scientific practice.



Simon Mutch

Bio

Dr Simon Mutch is a Senior Research Data Specialist in the Melbourne Data Analytics Platform (MDAP) at the University of Melbourne and, until recently, was a Postdoctoral Research Fellow in the Australian Research Council Centre of Excellence for All-Sky Astrophysics in 3-Dimensions (ASTRO 3D). Dr Mutch received a Masters degree in Physics from the University of Edinburgh and was awarded his PhD in astrophysics from Swinburne University of Technology, Australia in 2013. His astronomy research is focused on the first galaxies and their impact on the evolution of the Universe, which he studies using a combination of HPC simulations and theoretical modelling. Through his role with MDAP, he collaborates with other academics across a broad range of areas such as climate science, biosecurity modelling, phylodynamics and statistics, to help uplift their digital research capabilities.

Title of presentation

Strengthening digital research literacy through interdisciplinary collaboration

Short description of presentation

In this session we will discuss the challenges involved in strengthening digital literacy in the research community, and how the Melbourne Data Analytics Platform at The University of Melbourne is attempting to tackle some of these through interdisciplinary research.



Wendy Higgins

Bio

Wendy is currently completing a PhD in Cognitive Science with the School of Psychological Sciences at Macquarie University. Her research explores validity reporting practices in the psychological sciences empirically from the perspectives of metascience and the philosophies of science, psychology, and measurement.

Title of presentation

More than 1,600 studies have used the Reading the Mind in the Eyes test. How many of these studies do you think considered whether this test is valid?

Short description of presentation

The Reading the Mind in the Eyes Test (RMET) is one of the most widely used measures of social cognition in the psychological sciences. It is routinely claimed that the RMET is “well-validated”. However, in this talk I summarise preliminary findings from my scoping review of over 1,600 published RMET studies which demonstrates that there is remarkably little evidence that this measure is valid. Additionally, I present results from a recently published empirical study that provides evidence against the validity of the RMET. I urge the scientific community to consider the possibility that not all widely-used and purportedly “well-validated” measures are backed by acceptable validity evidence.



Karim Khan

Bio

Karim Khan is a Professor at the University of British Columbia, Vancouver, Canada and the Scientific Director of the Canadian Institutes of Health Research Institute of Musculoskeletal Health and Arthritis (CIHR-IMHA). With respect to metaresearch, he has published on grant and journal peer-review, consensus statements and has been part of several reporting guidelines.

Title of presentation

Improving the quality of consensus methods and consensus statements

Short description of presentation

Consensus processes and consensus statements are prevalent in modern health research but there is surprisingly little consensus on what makes a quality consensus statement. Professor Khan will share 4 criteria that he argues should be considered carefully by those who are working on consensus processes.



Alexandra Davidson

Bio

Ali is a research assistant at the Institute for Evidence-Based Healthcare at Bond University. She comes from a background as an Accredited Practising Dietitian, having worked in primary care, mental health, and acute hospital settings. She is currently doing her PhD at Bond University, and her main research interest areas are improving research practices, primary care, mental health, and qualitative research methods.

Title of presentation

Taxonomy of interventions at academic institutions to improve research quality

Short description of presentation

In this presentation, we will describe how we developed a taxonomy that classifies possible interventions to improve research quality, reduce waste and reproducibility within research-performing institutions. Key interventions should focus on those with the largest impact for the least cost to the institution, and further evaluation of the impact of interventions is needed.



Bermond Scoggins

Bio

Bermond Scoggins is a fourth-year PhD Candidate in political science at the Australian National University. Aside from his interest in metascience, his research focuses on understanding voter attitudes to undemocratic political behaviour in long-standing and new democracies.

Title of presentation

'Trust Us': Open Data and Preregistration in Political Science and International Relations

Short description of presentation

The presentation outlines the prevalence of open science practices in 20,000 statistical inference and 2000 experimental papers published since 2010 in the top 160 political science and international relations journals. Despite finding that approximately 21% of statistical inference papers have open data and 5% of experiments are preregistered, the discipline is improving over time.



Simine Vazire

Bio

My research examines whether and how science self-corrects, focusing on psychology. I study the research methods and practices used in psychology, as well as structural systems in science, such as peer review. I also examine whether people know themselves, and where our blind spots are in our self-knowledge. I teach research methods. I am editor in chief of *Collabra: Psychology*, one of the PIs on the replicATS project, and the co-founder (with Brian Nosek) of the Society for the Improvement of Psychological Science

Title of presentation

Pursuing truth in law and science

Short description of presentation

Both law and science pursue truth and involve formalized exercises in organized distrust. These similarities offer fertile ground for considering how the pursuit of factual accuracy in law and science is impaired by similar forces. For example, in both science and law, transparency prevents organized distrust from working well. In science: researchers can run many statistical tests and select the most favorable results to report; studies that result in null findings are hard to publish; and errors in the published record are challenging to address. In law: it's often hard to know what tests an expert performed and didn't report; swaths of the investigatory process are unreported by police; and multiple experts might be consulted by an adversarial party before one is selected for testimony. These and other similarities offer crucial opportunities for law and science to learn from each other's innovations. In this group, we will discuss these intersections between law and science, with the ultimate aim of producing a research agenda.



Sarah Rajtmajer

Bio

Sarah Rajtmajer is an assistant professor in the College of Information Sciences and Technology and research associate in the Rock Ethics Institute at The Pennsylvania State University. Her research uses machine learning and mathematical modeling for applications to social phenomena. Dr. Rajtmajer leads one arm of DARPA's Systematizing Confidence in Open Research and Evidence (SCORE) program, which seeks to develop and deploy AI to assign "confidence scores" to research claims published in the social and behavioral sciences literatures.

Title of presentation

An artificial prediction market for estimating confidence in published work

Short description of presentation

Our presentation will detail a three-year, ongoing effort undertaken by researchers at Penn State, Old Dominion University, Texas A&M, and Rutgers to develop artificially intelligent prediction markets to estimate the replicability of published research. This effort lays groundwork for hybrid approaches integrating human wisdom and machine rationality for research assessment.



Deborah Apthorp

Bio

Deborah Apthorp is a cognitive neuroscientist interested in vision, EEG and postural sway. Her current focus is on developing reliable markers for Parkinson's disease diagnosis and tracking using machine learning. She completed her PhD at the University of Sydney and is currently employed as a Senior Lecturer at the University of New England, NSW.

Title of presentation

Short description of presentation

In April of 2019, *Psychological Science* published its first issue in which all articles were awarded Open Data badges. Prompted by a tweet from open science activist Nick Brown, a group of twelve researchers set out to see if we could independently reproduce the published results from the materials provided. Ultimately, only one of the 14 articles could be exactly reproduced, with three more essentially reproducible with minor variations. I will talk about my experience being part of this project, and discuss recommendations for the future.



Elliot Gould

Bio

Elliot Gould is a PhD student at the School of BioSciences, University of Melbourne, with a background in applied ecology. Elliot is investigating the transparency and reproducibility ecological models in conservation decision-making and ecological management.

Title of presentation

Heterogeneity in results among studies in ecology and evolutionary biology – a ‘many analysts’ study

Short description of presentation

Sharing the results of the project and describe how they shed light on the sources of heterogeneity in their study.



Hannah Fraser

Bio

Hannah Fraser is a research fellow at the University of Melbourne working in Fiona Fidler's meta-research lab, MetaMelb. She is lead author of Questionable Research Practices in Ecology and Evolution (Fraser et al. 2018), which has received widespread attention (preprint downloaded 679 times). During her PhD, Hannah also gained expert elicitation experience. In 2020, Hannah was president of the Association of Interdisciplinary Meta-research & Open Science, an association she helped found. Hannah was the research coordinator for the repliCATS project in Phase 1, and will be remaining on the project in phase 2 in an advisory capacity.

Title of presentation

Heterogeneity in results among studies in ecology and evolutionary biology – the big picture

Short description of presentation

The sources of heterogeneity in ecological research, introduce the Many Eco Evo Analysts project, and outline their methods.



Alex Holcombe

Bio

Alex Holcombe, a professor of psychology at University of Sydney, has been involved in advancing open science through initiatives such as the web app [tenzing](#), the creation of the journal *Advances in Methods and Practices in Psychological Science* (2018), the [Free Journal Network](#), [Registered Replication Reports](#) (2014), and the journal PLOS ONE (2006). In the lab, Alex studies how humans perceive and process visual signals over time, as well as doing meta-science.

Title of presentation

Pursuing truth in law and science

Short description of presentation

Both law and science pursue truth and involve formalized exercises in organized distrust. These similarities offer fertile ground for considering how the pursuit of factual accuracy in law and science is impaired by similar forces. For example, in both science and law, transparency prevents organized distrust from working well. In science: researchers can run many statistical tests and select the most favorable results to report; studies that result in null findings are hard to publish; and errors in the published record are challenging to address. In law: it's often hard to know what tests an expert performed and didn't report; swaths of the investigatory process are unreported by police; and multiple experts might be consulted by an adversarial party before one is selected for testimony. These and other similarities offer crucial opportunities for law and science to learn from each other's innovations. In this group, we will discuss these intersections between law and science, with the ultimate aim of producing a research agenda.



Lauren Wool

Bio

Lauren E. Wool is a postdoctoral fellow in computational neuroscience at University College London, where she studies the large-scale population activity of motor neurons in the behaving mouse brain. She is fluent in big-data analysis, interdisciplinary team dynamics, and open science principles, and how they combine to generate high-impact resources for the scientific community. She studies knowledge transfer inside IBL, an open-science collaboration of 100+ neuroscientists worldwide.

Title of presentation

Open Neuroscience in the International Brain Laboratory

Short description of presentation

We discuss the open-science aims of the IBL, a neuroscience collaboration of over 100 members across institutions worldwide. How is knowledge produced in a flexible, distributed (and mostly virtual) community? How does this inform our methods and practices as scientists?



Mike McGuckin

Bio

Prof Mike McGuckin is Deputy Dean of the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne. In this role he oversees the research portfolios and has responsibility for People and Culture, Engagement and International Partnerships. Mike is a biomedical scientist, author of over 170 publications and has been heavily engaged in scientific societies and peer review.

Title of presentation

Ensuring Research Integrity: Why Institutional Leaders Should Care a Lot

Short description of presentation

The importance of ensuring quality and integrity of research from a leadership perspective, risks in the environment of researchers that promote poor culture, and the role of leadership in driving proactive programs to optimise quality and integrity.



Fiona Fidler**Bio**

Fiona is an Australian Research Council Future Fellow and a Professor in History and Philosophy Science at the University of Melbourne, Australia. (She holds a joint appointment in the School of Ecosystem and Forest Science.) Fiona originally trained as a psychologist, before undertaking a PhD in History and Philosophy of Science. Post-PhD, she spent a decade working in decision science research centres, developing methods for eliciting more reliable expert judgements to improve environmental and conservation decision making. Her abiding interest is in how experts, including scientists, make decisions and change their minds. She is particularly interested in how methodological change, as distinct from theory change, occurs in different disciplines (e.g., psychology, medicine, ecology). Fiona was the founding president of the Association for Interdisciplinary Metaresearch and Open Science (AIMOS). She co-leads the MetaMelb (meta)research group, is lead PI on the repliCATS project (Collaborative Assessments for Trustworthy Science), and is current Head of the History and Philosophy of Science Program at the University of Melbourne.

Title of presentation**Short description of presentation**

David Peterson

Bio

David Peterson received his PhD from Northwestern University and was a postdoc at UCLA before joining the sociology department at Purdue. He studies the nexus of scientific practice, emerging technologies, and expert authority. Currently, his work focuses on two topics. First, he studies how the organizations of science are evolving to meet a variety of threats including political pressure, intensifying global competition, new communications and machine learning technologies, and emerging regulatory and managerial bodies. Second, he investigates the production of science in areas that have had chronic legitimacy problems (like the social sciences) to shed light on the complex interactions between politics, expertise, and authority.

Title of presentation

Science IS Crisis: On Metascience and Crisis Diagnoses

Short description of presentation

It is widely accepted that the metascience movement emerged in reaction to the replication crisis. This talk complicates this picture in two ways. First, I argue that diagnoses of "crisis in science" have been a persistent feature of modern science and, second, that these diagnoses have always been motivated by metascientific arguments which reflect a variety of philosophical opinions about the correct role of science in society.



Kathleen Schmidt

Bio

Kathleen Schmidt is a Research Scientist at Ashland University and an Associate Director of the Psychological Science Accelerator. She received her Ph.D. in Psychology from the University of Virginia in 2014. Her research areas include implicit social cognition and reproducibility in psychological science. Prior to her current position, she was an Assistant Professor and Undergraduate Psychology Program Director at Southern Illinois University.

Title of presentation

Examining the Generalizability of Psychological Effects

Short description of presentation

The Psychological Science Accelerator (PSA) is seeking collaborators for a series of studies investigating the generalizability of psychological phenomena across university and community samples from around the globe. This talk will summarize project aims and invite study proposals and other contributions.



Nicole Nelson

Bio

Nicole C. Nelson is an Associate Professor of Science and Technology Studies in the Department of Medical History and Bioethics at the University of Wisconsin—Madison's School of Medicine and Public Health. Her first book, *Model Behavior* (2018), is an ethnographic study of how animal behavior geneticists conceptualize and enact complexity in research with mouse models. She is Co-Editor of the journal *Social Studies of Science*, the founding director of the Health and the Humanities program at UW Madison, and a former scholar in residence at the Radcliffe Institute for Advanced Study at Harvard University. Her current research focuses on the “reproducibility crisis” in biomedicine and its relationship to histories of biomedical and open science research reform.

Title of presentation

A history of American biomedical rigor and reproducibility reform

Short description of presentation

This talk will provide a history of the emergence of the reproducibility/replication crisis from the vantage point of American biomedicine. It will show the National Institutes of Health's existing commitments to translational research made it difficult to ignore reports of irreproducible research from pharmaceutical companies, and that the NIH's eventual reforms were patterned after earlier reforms in clinical research.



Thomas Pfeiffer

Bio

New Zealand Institute for Advanced Study. Thomas' research interests are game theory and metascience. In particular, he is interested in mechanisms of information elicitation and aggregation, and how such mechanisms can be used for the benefit of science. Thomas was part of the team running replicationmarkets.com for large-scale replication forecasting within DARPA's SCORE project.

Title of presentation

Forecasting outcomes in scientific research

Short description of presentation

Crowd-sourced forecasting projects have been used to predict outcomes in scientific research, and in the past many projects have focused on replication outcomes. In my presentation I will discuss experiences from forecasting projects that focus on outcomes beyond replications



Tim Errington

Bio

Tim received his Masters in Molecular and Cell Biology from the University of California at Berkeley and his PhD in Microbiology, Immunology, and Cancer Biology from the University of Virginia. He is currently the Senior Director of Research at the Center for Open Science where he collaborates with researchers and stakeholders across scientific disciplines and organizations on metascience projects aiming to understand the current research process and evaluating initiatives designed to increase credibility and openness of scientific research.

Title of presentation

Creating a claims and empirical evidence database for confidence assessment.

Short description of presentation

A corpus of social and behavioral science papers from over 60 journals over a 10 year period were used to extract claims for further assessment by human judgement and algorithmic approaches. From this corpus a subset of claims were investigated for objective evidence of credibility - specifically, process reproducibility (availability of data and code), reproducibility (reanalysis using original data and analytical strategy), robustness (multiple analytical strategies using original data), and replicability (same analytical strategy on new data) - with replicability serving as the ground truth for human assessment within the program.



Janayne Carvalho do Amaral

Bio

Janayne do Amaral is Postdoctoral Research Associate at the School of Information Sciences at the University of Illinois Urbana-Champaign. In 2022, she earned her Ph.D. in Information Science at Federal University of Rio de Janeiro/Brazilian Institute of Information in Science and Technology. Her research focuses on open peer review models with public participation and on public engagement through scientific journals.

Title of presentation

Patients in peer review: the *Research Involvement and Engagement* journal initiative

Short description of presentation

This presentation will describe how the journal *Research Involvement and Engagement*, launched in 2015, engages patients and the public in the peer review process.



Kylie Hunter

Bio

Kylie Hunter is a Senior Evidence Analyst and PhD candidate within the NextGen Evidence Synthesis Team at the NHMRC Clinical Trials Centre, University of Sydney. She is also Associate Convenor of the Cochrane Prospective Meta-Analysis Methods Group. Kylie's research focuses on collaborative methodologies to improve evidence synthesis, such as individual participant data (IPD) meta-analysis and prospective meta-analysis (PMA). She is part of the leadership team of several large collaborations employing these methods in child health (e.g. iCOMP and TOPCHILD).

Title of presentation

Short description of presentation

Individual participant data meta-analyses involve collecting raw data for each participant from each included study. This presentation will describe the development and application of an integrity tool to assess trustworthiness of trial data for inclusion in a large Individual participant data meta-analysis.



Jason Chin

Bio

Jason studies science in the legal system. Prior to practicing law, Jason conducted psychological research. He is senior lecturer at ANU.

Title of presentation 1

Mapping the landscape of metaresearch communities

Short description of presentation 1

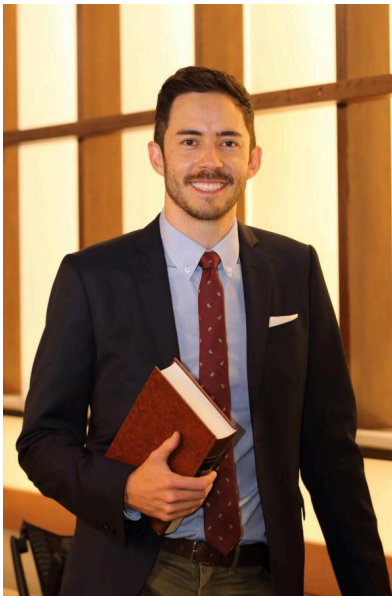
We are trying to better understand what the landscape of metaresearch communities looks like. To do this, we are systematically searching the internet for metaresearch communities and coding any communities we identify to determine what activities they engage in. We hope to produce an article and any contributions made during this hackathon will be determined via the CREDIT guidelines.

Title of presentation 2

Pursuing truth in law and science

Short description of presentation 2

This discussion group will consider common challenges and innovations in pursuing factual accuracy in law and science. The ultimate aim is to begin projects in which law and science can inform each other's progress.



Tess Neal

Bio

Tess Neal is a licensed clinical psychologist and forensic psychologist trained to assess, diagnose, and treat mental and behavioral disorders. Bringing psychology into legal contexts, she studies human judgment processes as they intersect with the law, especially among trained experts (such as forensic psychologists, attorneys, judges, and forensic scientists), and the nature and limits of expertise. Her research focuses on understanding and improving judgment processes. Neal serves as an associate editor for the *Journal of Personality Assessment* as well as *Psychology, Public Policy, and Law*, and she serves as Open Science Editor for *Clinical Psychological Science*. She is inaugural director of ASU's Future of Forensic Science Initiative, founding faculty member of ASU's Law and Behavioral Science Initiative, and directs the Clinical and Legal Judgment Lab.

Title of presentation

Pursuing truth in law and science

Short description of presentation

Both law and science pursue truth and involve formalized exercises in organized distrust. These similarities offer fertile ground for considering how the pursuit of factual accuracy in law and science is impaired by similar forces. For example, in both science and law, transparency prevents organized distrust from working well. In science: researchers can run many statistical tests and select the most favorable results to report; studies that result in null findings are hard to publish; and errors in the published record are challenging to address. In law: it's often hard to know what tests an expert performed and didn't report; swaths of the investigatory process are unreported by police; and multiple experts might be consulted by an adversarial party before one is selected for testimony. These and other similarities offer crucial opportunities for law and science to learn from each other's innovations. In this group, we will discuss these intersections between law and science, with the ultimate aim of producing a research agenda.



Mar Quiroga

Bio

Mar is a Research Data Specialist at the Melbourne Data Analytics Platform, The University of Melbourne, where she works with researchers across all domains to bring the benefits of data-intensive methods to their fields. Previously she optimised the allocation of medical diagnostic equipment for the World Bank using a mathematical model and helped evaluate Melbourne's Medically Supervised Injecting Room for the Victorian Government using data from interviews, Medicare, and other government sources.

Mar holds a BSc/MSc in Mathematics from the University of Cordoba, Argentina, and a PhD in computational and experimental neuroscience from Rutgers University, USA.

Title of presentation 1

Crunch: A Data Processing Orchestration Tool for Open Science

Short description of presentation 1

Reproducible data processing pipelines are essential for open science. Here we present django-crunch, a tool for processing large numbers of datasets using the same workflow and to making the results accessible online.

Title of presentation 2

Strengthening digital research literacy through interdisciplinary collaboration

Short description of presentation 2

In this session we will discuss the challenges involved in strengthening digital literacy in the research community, and how the Melbourne Data Analytics Platform at The University of Melbourne is attempting to tackle some of these through interdisciplinary research.



Tim Parker**Bio**

Tim is a behavioral ecologist who conducts occasional meta-analyses, and this work with meta-analysis led (as it has in many others) to an interest in the reliability of the published literature. He has devoted much of the past decade to empirical exploration of the reliability of ecology, evolutionary biology, and other disciplines, and to improving the reliability of published work. Tim has co-authored numerous advocacy and empirical papers on these topics, is a founding member of SORTEE (the Society for Open, Reliable, and Transparent Ecology and Evolutionary biology), and served as SORTEE's first president. He is a professor of biology at Whitman College in Washington State, USA.

Title of presentation

Heterogeneity in results among studies in ecology and evolutionary biology – implications for the future

Short description of presentation

Although variation in effect sizes and predicted values among studies of similar phenomena is inevitable, such variation far exceeds what might be produced by sampling error. One possible explanation for this heterogeneity in results is differences in the decisions researchers make regarding statistical analyses. To explore the role of these analytical decisions in driving heterogeneity in results, we posted an open invitation to researchers in ecology and evolutionary biology to analyze either of two unpublished data sets to answer a corresponding pre-determined question. The volunteer analysts who responded to our invitation submitted 132 answers to the question from one data set and 80 answers to the question from the other data set. For both data sets, the answers varied substantially, although the pattern of variation among answers differed between the two. We hypothesize about the factors that may have driven the difference in distribution of effect sizes between the two data sets, and we discuss potential implications for the future of data analyses in ecology and evolutionary biology given the substantial variability driven by divergence in analytical decisions.



Julia Espinosa

Bio

Julia is a National Science Foundation Postdoctoral Research Fellow at Harvard University. Her current work looks at the individual differences contributing to behavior phenotypes in domestic dogs, including life history, genetics, and neuroanatomy. Her primary research interests are in canine science, and she uses tools from cognitive and developmental psychology, welfare science, genetics, ethology, and neuroscience to investigate the cognitive processes and emotions underlying dog behavior. Julia is a co-founder of [ManyDogs](#) and the project lead of their first study, [ManyDogs 1: A Multi-Lab Replication Study of Dogs' Pointing Comprehension](#).

Title of presentation

Running with the Big Dogs: Building an international dog [scientist] pack as an early career researcher

Short description of presentation

In my presentation I will introduce the ManyDogs Project, an initiative that I co-founded and have been steering since 2018. Our first project is nearing the end of the data collection period when we convene for the conference, so I will be able to share preliminary results along with my insights and my ECR experiences of uniting and leading a group of established colleagues.



Anisa Rowhani-Farid

Bio

Anisa Rowhani-Farid has recently completed her postdoctoral fellowship in clinical trial integrity at the Restoring Invisible and Abandoned Trials (RIAT) support center at the Pharmaceutical Health Services Research department at the University of Maryland School of Pharmacy. She does research on research to strengthen the regulation of clinical research and to promote open research, making science more reliable, trustworthy, verifiable, transparent, and robust. She did her first postdoctoral fellowship in meta-research at the Collaboration for Research Integrity and Transparency at the Yale Law School, School of Medicine and School of Public Health, and at the Center for Outcomes Research and Evaluation at the Yale School of Medicine. Anisa received her doctorate from the Australian Centre for Health Services Innovation at the Queensland University of Technology in Brisbane, Australia.

Title of presentation

Clinical trial integrity and transparency

Short description of presentation

Clinical trials are the gold standard of research providing evidence on the safety and efficacy of drugs and interventions. This presentation will explore the importance of clinical trials accurately reporting their study design, endpoints, and results.



Lisa Parker

Bio

Lisa Parker is a researcher, bioethicist and practicing doctor. Her research focus is on critical evaluation of healthcare practice, policy and evidence. She has led recent studies on research fraud, conflicts of interest, and industry influence in health. Lisa has expertise in qualitative research methodology. She works as a CMO in radiation oncology at Royal North Shore Hospital in Sydney.

Title of presentation

How to be a research detective: Warning signs of research fraud

Short description of presentation

I will discuss findings from a recent qualitative interview study with research experts where I describe collated warning signs for research fraud. An important first step is to have fraud in mind when reading empirical studies, and then researchers, editors and publishers can run through a short screening list to identify studies that warrant further scrutiny



Yefeng Yang

Bio

Dr. Yefeng Yang is a Research Associate in University of New South Wales, Sydney, Australia. His main research is focusing on meta-analytic methodologies and application.

Title of presentation

Persistent publication bias and low power in ecology and evolution

Short description of presentation

This talk will give a brief introduction to how to assess the replicability of empirical studies in the absence of direct replication projects in ecology and evolutionary biology.



James Sotiropoulos

Bio

James is a Masters of Philosophy (Medicine and Health) student at the University of Sydney and medical student at UNSW on extended rural placement in Coffs Harbour. James' research focuses on applying next generation evidence synthesis methods (such as prospective and network meta-analysis) to answer the question of the ideal concentration of oxygen to use when resuscitating preterm infants at birth.

Title of presentation

Developing guidance for outcome harmonisation in prospective meta-analysis

Short description of presentation

The ability to harmonise outcomes is a key advantage of prospective meta-analysis - a novel evidence synthesis technique where studies are identified as eligible prior to results being known. In this presentation, we provide preliminary guidance on the process of performing outcome harmonisation illustrated by a case study.



Malgorzata Lagisz (Losia)

Bio

I am a biologist with research experience and skills in different fields of science. My work includes meta-analyses of maternal effects, aspects of aging, evolution and differences between the sexes, and many more topics. I also contribute to methodological works addressing widespread issues in meta-analysis, such as non-independence, heterogeneity, reporting quality and open science practices. More at <https://mlagisz.weebly.com/>.

Title of presentation 1

Assessing criteria of "best paper" awards across disciplines

Short description of presentation 1

The aim of this hackathon is to evaluate criteria and procedures of a sample of "best paper" awards across disciplines.

Title of presentation 2

What research awards have to do with Open Science?

Short description of presentation 2

Open Science aims to improve research practice, while research awards provide recognition to outstanding researchers for excellent research. But what "excellent research" means? Do assessments of nominated research/researchers consider robustness, transparency, replication, and adherence to other core principles of Open Science? In this talk, I will present results of a project evaluating 11 "best paper" awards and 13 "best researcher" awards from broad-scope international journals and societies in ecology and evolution. We focused on the awards available to early and mid-career researchers and collected data on eligibility rules and assessment criteria. We also coded which awards explicitly value good Open Science practices. The results of this project highlight instances of desirable practices and the lack of such, hopefully nudging award committees to shift away from simple but non-equitable award policies and to promote Open Science values. Finally, I will outline a follow-up project that will be facilitated as one of the hackathons during AIMOS2022 (the aim of this project is to evaluate criteria and procedures in a sample of "best paper" awards across disciplines, and you are invited to join!).



Robert Turnbull

Bio

Robert previously worked on developing modelling software for geodynamics and 3D visualisation. He recently completed his PhD thesis which involved using Bayesian phylogenetics to study the transmission history of medieval Arabic manuscripts. He currently works as a Research Data Specialist at the Melbourne Data Analytics Platform (University of Melbourne).

Title of presentation

Crunch: A Data Processing Orchestration Tool for Open Science

Short description of presentation

Reproducible data processing pipelines are essential for open science. Here we present *django-crunch*, a tool for processing large numbers of datasets using the same workflow and to making the results accessible online.



Adrian Barnett

Bio

Adrian is a professor of statistics who has worked for over 27 years in health and medical research. He is passionate about using the best available evidence in national health and science policy. His current research concerns improving statistical practice to reduce research waste.

Title of presentation

Funding for meta-research: what are our options?

Short description of presentation

This session will discuss the challenges of winning funding for meta-research and ideally formulate strategies to help all meta-researchers. Please bring your own ideas for a lively discussion. This session aims to be relevant to researchers from all fields and all experience levels.



Aidan Tan

Bio

Aidan is a clinician, researcher and academic based in Sydney. He is a Paediatric Physician Basic Trainee at Sydney Children's Hospital, Randwick, with a passion for evidence-based medicine in neonates, infants and children, and PhD candidate at The University of Sydney, with an interest in meta-research and clinical epidemiology. He leads international studies to improve research methods and clinical trials.

Title of presentation

Prevalence and characteristics of data sharing policies across the health research life cycle: funders, ethics committees, trial registries, journals, and data repositories

Short description of presentation

One way to reduce the gap between high in-principle support for the concept of data sharing and low in-practice commitment to sharing data is if major stakeholders across the health research life cycle implement policies to recommend or require data sharing. This lightning talk will explore the prevalence and characteristics of data sharing policies.



Patrick Vu

Bio

Patrick Vu's research examines the impact of selective publication and statistical power on the credibility of published research and evidence-based policy. He received his undergraduate degree with majors in Economics and Music from the University of Western Australia, his MPhil in Economics at the University of Oxford, and is currently completing his economics PhD at Brown University.

Title of presentation

Can the Replication Rate Tell Us About Publication Bias?

Short description of presentation

Contrary to common perceptions, selective publication against null findings is unlikely to explain low replication rates owing to a statistical issue with the most frequently used replication indicator. Instead, issues with common power calculations in replications in conjunction with low power in original studies can account fully for the low replication rates observed in experimental economics and experimental social science, and around two-thirds of the gap between the replication rate and its intended target in psychology.



Janet Freilich**Bio**

Janet Freilich is a Professor at Fordham Law School. She writes and teaches in the areas of patent law, intellectual property, and civil procedure. She graduated magna cum laude from Harvard Law School and summa cum laude from Cornell University with a bachelor's degree in molecular biology.

Title of presentation

Credibility of Science in Patents

Short description of presentation

Scientific details in patents are sometimes viewed as particularly reliable. Unfortunately, this is not the case. Science in patents is often fictional or irreproducible and examiners have little ability to verify information submitted by applicants.



Jana Christopher

Bio

Jana was the first Image Integrity Analyst at EMBO Press, helping to set up the programme in 2011. She started her own business *Image-Integrity* in 2015.

Jana joined FEBS Press in 2017 as Image Data Integrity Analyst for their 4 journals, and also works as a freelance consultant for various journals, publishers and institutes. She also runs training courses, and presents to students and young scientists.

Title of presentation

Image integrity - correcting the published record

Short description of presentation

This talk outlines the process of detecting and retracting fraudulent research papers, and specifically paper mill material.

It describes real world challenges of correcting the literature, and suggests ways to address them



Anna Lene Seidler (Lene)**Bio**

Lene's work focuses on methods aimed at increasing collaboration and coordination in research to maximise the value of data and reduce research waste. This includes the development and application of next generation evidence synthesis approaches such as individual participant data and prospective meta-analysis. Lene works as a Senior Research Fellow at the NHMRC Clinical Trials Centre (CTC), University of Sydney where she leads the NextGen Evidence Synthesis team within the Evidence Integration group. She is also a Research Associate for the Australian New Zealand Clinical Trials Registry, and Co-Convenor of the Cochrane Prospective Meta-Analysis Methods Group.

Title of presentation

The TOPCHILD (Transforming Obesity Prevention for CHILDren) Collaboration – working together to address the complex quest of early childhood obesity prevention

Short description of presentation

The TOPCHILD (Transforming Obesity Prevention for CHILDren) collaboration brings together individual participant data from over 50 trials with a total of 40,000 participants to address the complex public health issue of how to prevent childhood obesity. This presentation will give a snapshot of the main challenges, solutions and lessons learnt from this major collaborative undertaking.



Barbara Mintzes

Bio

Barbara Mintzes is an Associate Professor, School of Pharmacy and Charles Perkins Centre (CPC), at the University of Sydney. She holds a PhD in epidemiology from the University of British Columbia. Her research areas include policy analyses, impacts of conflicts of interest on research and practice, systematic reviews, and pharmacoepidemiology research. She has led international comparative studies on direct-to-consumer advertising of medicines, the quality of information provided to family doctors by pharmaceutical sales representatives, and post-market regulatory safety warnings.

Title of presentation

Conflicts of interest and bias in medical research

Short description of presentation

Pharmaceutical and device industry funding of medical research is widespread, influencing which research questions are addressed and how studies are conducted and reported, with implications for clinical care. A conflict exists between scientific objectivity and the needs of manufacturers to recoup development costs and gain market share, and both the results and conclusions of industry-sponsored research tend to be more favourable to the tested product than non-industry sponsored research. I will discuss the mechanisms contributing to this bias as well as potential solutions.



Mark Burgman

Bio

Mark Burgman is Professor of Risk Analysis and Environmental Policy at Imperial College London. Previously, he was Director of the Australian Centre of Excellence for Risk Analysis and the Adrienne Clarke Chair of Botany at the University of Melbourne. He has worked on expert judgement, decision analysis, conservation biology and risk assessment in a broad range of settings including marine fisheries, forestry, irrigation, electrical power utilities, mining, and national park planning. He has been Editor-in-Chief of the journal Conservation Biology since 2013.

Title of presentation

Statistics wars and their implications for journal editors.

Short description of presentation

The debates continue about how scientific journals should handle issues such as questionable research practices, p-values, Bayesian inference and related matters. This presentation examines the implications of this debate for a journal directly linked to conservation decision-making, with a special focus on the potential for false positive results to affect human impacts on the environment.



Ben Mol

Bio

Ben (Willem) Mol is Professor of Obstetrics and Gynaecology at Monash University. Since his arrival in Australia in 2014, Ben holds continuous NHMRC funding, including a prestigious investigator grant, and has been recognized as a very productive (Nature) and well cited (The Australian) author.

During his time in Australia, Ben has worked on clinical trial capacity in women's health at Monash. He developed extensive relations with Asian universities, resulting in large randomised clinical trials. Ben is also involved in many Individual Participant Data Meta-Analysis, in which on many topics in Obstetrics and in Reproductive Medicine data of randomised clinical trials performed worldwide are brought together. Recently, Ben has worked also on systems to detect data-fabrication in RCTs.

His professional adage is 'A day without randomisation is a day without progress.'

Title of presentation

Now we have the data but are the data true

Short description of presentation

Modern medicine is based randomised clinical trials (RCTs). While the number of RCTs is gradually increasing, nobody usually asks whether these RCTs are trustworthy. In recent years I found out that about 30% of the RCTs in Women's Health are fabricated. I will share my experiences in this endeavour. Medical science is the Olympics without doping checks.



John Loadsman**Bio**

I am a full-time Staff Specialist anaesthetist at Royal Prince Alfred Hospital, Conjoint Associate Professor in Anaesthetics at the University of Sydney, and Editor-in-Chief of *Anaesthesia and Intensive Care*, journal of the Australian Society of Anaesthetists. My interest in publication integrity was first sparked when I noticed cases of duplication and plagiarism as the journal's proofreader in the late 90s. Skills honed as an editor since then have enabled me to detect numerous cases of fraud submitted to my journal and published elsewhere.

Title of presentation

Correcting the scientific record: the experience and perspective of one journal editor

Short description of presentation

Journal editors have been justifiably criticised for failing to maintain the integrity of the scientific record, both prior to and after publication. This talk will highlight some of the experiences of one editor determined to make a better contribution, both as gatekeeper and whistleblower



Dr. Nicholas Coles

Bio

Dr. Nicholas Coles is a Research Scientist at Stanford University, the co-director of the Stanford Big Team Science Lab, and the Director of the Psychological Science Accelerator. He conducts research in affective science, cross-cultural psychology, and meta-science. In affective science, Nicholas seeks to understand the social, cognitive, and physiological processes that underlie emotion. In meta-science, Nicholas works on building research infrastructure that allows researchers to more efficiently obtain knowledge in the social sciences.

Title of presentation

Grappling with generalizability constraints in the social sciences via big-team science.

Short description of presentation

Big-team science has been leveraged to both discover and address issues about generalizability in the social sciences. In this talk, Nicholas Coles will review these developments and their implications for future small- and large-scale research in the social sciences.

Head Shot



Sophia Crüwell

Bio

Sophia a PhD student in Philosophy of Science at the University of Cambridge. My research interests revolve around the replication crisis in psychology. I also work on empirical meta-research projects with the meta-research innovation centre in Berlin (METRIC-Berlin). Together with Amy Orben and Sam Parsons, I started the journal club initiative ReproducibiliTea, and I am still involved in the global ReproducibiliTea steering committee.

Presentation title

The Data Badge Project - do badges encourage computational reproducibility?

Abstract

In April of 2019, *Psychological Science* published its first issue in which all articles were awarded Open Data badges. Prompted by a tweet from open science activist Nick Brown, a group of twelve researchers set out to see if we could independently reproduce the published results from the materials provided. Ultimately, only one of the 14 articles could be exactly reproduced, with three more essentially reproducible with minor variations. I will talk about my experience being part of this project, and discuss recommendations for the future.



Richard McGee

Bio

Dr Richard McGee is a paediatric endocrinologist, clinical academic and meta-researcher bringing evidence to paediatrics and endocrinology. He aims to improve patient outcomes, representation and research standards.

Presentation title

A review of retracted publications in paediatric endocrinology.

Abstract

The quality of the published literature relies heavily on peer-review. Retractions are another method of managing the evidence base and can be used to deal with fraud, scientific misconduct, and serious errors. We aimed to describe the characteristics and rate of retractions in paediatric endocrinology articles.



Sujatha Raman

Bio

Sujatha Raman is UNESCO Chair-holder in Science Communication for the Public Good and Director of Research at the Centre for the Public Awareness of Science (CPAS), Australian National University. Trained in STS and public policy studies, she is interested in normative questions arising from efforts to bring science and technology to bear on global sustainability challenges. Her current work in the UNESCO Chair explores what is entailed by appeals to science as a public good.

Presentation title

How public good matters complicate the public trust question for science

Abstract

Questions of public trust in science have typically been posed in response to specific concerns about the harms that ensue from a perceived lack of such trust (e.g., rejection of vaccines or embrace of 'alternative' therapies ungrounded in evidence). Framed this way, solutions have ranged from increasing scientific literacy amongst the public to greater openness and transparency in scientific procedures to stemming the flow of misinformation. In this talk, I will try to reframe the public trust question by drawing from a parallel concern with the public good in science articulated most notably in recent years by the International Council for Science. From a public good perspective, trust in specific scientific propositions may become less important than the way in which science speaks to ongoing agendas for system-wide transformation.



Dimitrios Vagenas

Bio

Dimitrios is a Biostatistician, Associate Professor, and head of the Research Methods Group in the faculty of Health, QUT. He also studied animal science, quantitative genetics and has been a mathematical modeller. He is currently the president of the QLD branch of the Statistical Society of Australia and a member of the national accreditation committee of this society.

Presentation title

Lessons from post-publication statistical reviews

Abstract

This research focuses on reviewing current statistical practices and identifies common statistical misconceptions made by health researchers when using linear regression. Results from our random sample of 100 PLOS ONE papers indicate that most authors poorly reported statistical analysis. Recommendations for improving this interpretation gap include teaching statistics holistically, where most statistics can be seen in a regression framework rather than a series of unconnected tests.

