

University of Surrey
Annual Open Research Lecture
Friday 8th April 2022



UNIVERSITY OF SURREY

Open Research



Dear Colleagues,

Welcome to the Inaugural University of Surrey Open Research Lecture. This is the first in a series of annual lectures, planned for the forthcoming years. The series provides a platform for our community across all disciplines and career stages to discuss and share their knowledge, experience, and aspirations in Open Research. In designing this year's event, we acted on feedback from our very successful [Surrey Open Research and Transparency Showcase](#), held in March 2021. Our 2022 event includes networking opportunities and a panel discussion, whilst our poster session is designed to encompass the full range of stages along the Open Research journey, from researchers who are just starting out, to researchers who are showcasing their Open Research practices.

The 2022 Annual Open Research Lecture could not have come together without the help and contribution of many people. First, we would like to thank our keynote speaker, Dr Karen Salt and our panel members, Professor Marcus Munafo, Dr Marton Ribary and Grace Gottlieb, who have given up their time and travelled to be here with us. We also thank our PVCRI, Professor David Sampson, for supporting our Open Research culture, and for opening the event. Of course, a big thank you to all of you who are presenting each of the 30 posters in our poster session. I would personally like to thank the rest of the organising team: Dr Emma Henderson, Becky Watt, Mel Flaxten and Catherine Stephen.

We hope to that this is an inspiring event and that you enjoy the afternoon.

Professor Emily Farran

Academic Lead Research Culture and Integrity

Date for your diary:

2023 Annual Open Research Lecture, Spring 2023. Keynote speakers: Co-chairs of the new UK [Committee on Research Integrity \(UK CORI\)](#), Professor Andrew George MBE and Professor Rachael Goberman-Hill.

Resources: [Surrey Open Research handbook](#).

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Event Schedule

Time	Event
2pm	Opening by Professor David Sampson and Professor Emily Farran
2:15pm	Open Research Lecture, Dr Karen Salt “Open and Transparent Research Culture”
3:15pm	Poster Session
4pm	Refreshment Break
4:30pm	Round Table Panel Discussion “Incentivising Open Research across all disciplines” Panel: Dr Karen Salt (Deputy Director, R&D Culture and Environment, UKRI), Professor Marcus Munafo (Head of UKRN), Dr Marton Ribary (Winner of 2021 Open Research Award, Surrey) and Grace Gottlieb (Head of Research Policy, UCL).
5:15pm	Wine Reception
6:30pm	End

Keynote Speaker Abstract

Dr Karen Salt

Deputy Director for Research Culture & Environment, UKRI

Open and Transparent Research Culture

Programmes, initiatives and policies abound place transparency, openness and, increasingly, accessibility, at the heart of open research endeavours. While reproducibility and replicability often dominate these discussions, culture continues to engage and ensnarl most open research strategies. Culture, at its most basic, is the norms, conditions, behaviours, practices and relationships that surround researchers in any given environment. Often articulated as a big C, culture operates more as mini-systems, a small c, that morph and transmit half-muttered truths and uncertain possibilities. As such, cultural change promises transformation even as it often resists alteration.

For Open Research and Research Culture more broadly, this resistance and potentiality are less liabilities than they are opportunities for experimenting, trialing and generating new ways of relating. Some of this is about process, such as open peer review, but other aspects involve power and creativity and how to flatten the former without dousing the latter.

UKRI and colleagues across the networks at Surrey and beyond have consistently and patiently been building creative systems that are working to make inclusion, culture, recognition, open access and integrity all business as usual. This talk does not attempt to catalogue these and other initiatives or policies. It also does not attempt to argue for their need. We are well past the need to argue for this type of work. Instead, this talk challenges us – in the biggest and widest sense possible – to imagine what's next for research culture as we seek to shake loose a more radical, inclusive and open future.

Biographies of Keynote Speaker and Panelists

Dr Karen Salt

Deputy Director for Research Culture & Environment, UKRI



Biography

Dr Karen Salt has over 27 years' worth of experience working in and with communities, organisations, charities, and governmental bodies. An expert on systems and transformative change, she has managed large research teams and collaborated on a number of research projects, including those involving community members as active researchers and those exploring the governance of technology deployed for public good. Now based in UKRI, she is the Deputy Director for R&D Culture and Environment, a policy area that brings together teams working on ethics, research integrity, research and innovation culture, equality, diversity and inclusion, and open research. She is also the senior-level policy lead within UKRI on Trusted Research, leading an integrated programme of work to safeguard the security and integrity of international collaborations and partnerships. A sought after thought-leader and speaker, Salt works closely with senior leadership across Government, academia, civil society and industry, and contributes to numerous international initiatives focused on embedding inclusive policymaking.

Professor Marcus Munafò
Head of UK Reproducibility Network



Biography

Marcus Munafò is Professor of Biological Psychology and MRC investigator at the University of Bristol, where he was recently appointed Associate Pro-Vice Chancellor for Research Culture. In 2019 he co-founded the UK Reproducibility Network (www.ukrn.org), which now comprises 57 local networks of grassroots researchers and 22 institutional members, as well as an external stakeholder group comprising over 25 funders, publishers, learned societies and other sectoral organisations.

Grace Gottlieb
Head of Research Policy, UCL



Biography

Grace Gottlieb is Head of Research Policy. She joined the Office of the Vice-Provost (Research) in 2017 and drives forward UCL's research policy agenda, leading on policy development and advocacy of UCL's positions. She also works on implementation of the UCL Research Strategy, including leading the development of internal policy. At present her work focuses on analysis of R&D funding and promoting transparency and reproducibility in research. Before joining UC, Grace worked at the Medical Research Council and, prior to that, in health policy at the Royal College of Surgeons.

She has a BA in Natural Sciences, specialising in genetics, from the University of Cambridge.

Dr Marton Ribary
Winner of the Surrey 2021 Open Research Award



Biography

Marton Ribary is a Leverhulme Early Career Research Fellow at the University of Surrey School of Law where his research focuses on legal reasoning. He experiments with Natural Language Processing and algorithmic rule modelling methods applied to Roman legal texts. Marton is interested in modelling the rhetorical strategies of constructing a persuasive argument which involves the modelling of structured legal knowledge, formal rules, and counterfactual arguments. He has a background in philosophy (MA, Budapest), ancient legal history (MPhil, Oxford; PhD, Manchester), and library and information studies (MA, UCL).

Poster Presentations

Alphabetical order by surname of presenter

Presenter in bold

<p>1. Enzymatic Degradation of Polyethylene Terephthalate (PET) Plastic: A Sustainable Approach Umar Abdulmutalib, Juhyun Kim, Manuel Salvador de Lara, Alice Banks, Claudio Avignone Rossa, and Jose Jiminez</p>
<p>2. Exploring Open Research opportunities to enrich the development of a PhD project Tamala Anderson</p>
<p>3. Open research human transcriptome time series database from sleep and circadian studies for data science, machine learning & biomarker discovery Simon N Archer, Derk-Jan Dijk, Carla Moller-Levet, and Emma E Laing</p>
<p>4. Proposed registered-report qualitative study submission titled: Through the lens of Developmental Coordination Disorder (DCD/Dyspraxia): Experiences of a late diagnosis Gemma Armstrong, Judith Gentle, and Marta Topor</p>
<p>5. Automatic analysis 5.8.0: Demonstration of integrated and responsive open-source development Tibor Auer, Michael Jones, Ethan Knights, and Jonathan Peelle</p>
<p>6. Open Research practices in qualitative research: A beginner's guide Delia Ciobotaru, Delia Lucarelli, Mark Cropley, Ines Violante, and Roi Cohen Kadosh</p>
<p>7. Physionet ECG database as a resource for pilot studies in cardiovascular research Steve Creasy, Vadim Alexeenko, Jane Lyle, Philip Aston, and Kamalan Jeevaratnam</p>
<p>8. Does wearing a bicycle helmet really increase risk taking and sensation seeking in adults? A registered-report replication Tim Gamble and Ian Walker</p>
<p>9. Simulation of the Risk of Salmonellosis in humans conditional to weather using modelling Laura C. Gonzalez Villeta and Giovanni Lo Iacono</p>
<p>10. An Open Research approach to investigating how eye-tracking technology has been used as a tool to evaluate social cognition in intellectual disability Lauren Jenner, Rachel Howard, Ridhi Sahni, Emily K. Farran, and Jo Moss</p>
<p>11. "Well, if they're an environmental activist, then I should be one too": A disrupt-then-reframe approach to stimulating pro-environmental intentions Christopher R. Jones and Ana Gheorghiu</p>

<p>12. Using open data and code to investigate brain-behaviour relationships <i>Danielle Lauren Kurtin, Henry Hebron, Anne Skeldon, Gregory Scott, and Ines R Violante</i></p>
<p>13. Fully open-sourced music source separation and speech quality enhancement systems <i>Haohe Liu</i></p>
<p>14. The reproducibility EEG checklist: creating a checklist for cognitive EEG studies to promote Open Science <i>Anna Maria Manti, Henry Hebron, and Ines Violante</i></p>
<p>15. Assessing the impact of LEGO® construction training on spatial and mathematical skills: Reflecting on the strengths and challenges of a Stage 1 Registered Report <i>Emily McDougal, Priya Silverstein, Oscar Treleaven, Lewis Jerrom, Katie Gilligan-Lee, Camilla Gilmore, and Emily K. Farran</i></p>
<p>16. Virtual consultations for people with learning disabilities, their families and healthcare providers: A co-design study to aid implementation in everyday practice. A Study Proposal/Early-Stage Research <i>Freda Mold, Debbie Cooke, Anna Cox, Paul Shanahan, Jo Armes, Vicki Tsianakas, and Harm van Marwijk</i></p>
<p>17. Showering Smartly in tourism accomodations <i>Pablo Pereira-Doel, Xavier Font, Kayleigh Wyles, and Jorge Pereira-Moliner</i></p>
<p>18. A systematic review and meta-analysis to quantify weight loss in pancreatic cancer: Challenges using published research based on healthcare data <i>Claire A. Price, Debbie Cooke, Martyn Winn, Nadia A. Smith, and Agnieszka Lemanska</i></p>
<p>19. A study protocol for the validation of a primary care-based data-driven algorithm to predict pancreatic cancer in the UK setting: Challenges of Open Research using routine healthcare data <i>Claire A. Price, Debbie Cooke, Martyn Winn, Nadia A. Smith, and Agnieszka Lemanska</i></p>
<p>20. How can Affordance Based Design Improve Collaboration Efficacy in the Workplace to accelerate value-driven Industry 5.0 <i>Melanie Rich, Christopher Turner, and Wolfgang Garn</i></p>
<p>21. Two Decades of Open Data for Language Diversity at the Surrey Morphology Group <i>Erich Round and Sacha Beniamine</i></p>
<p>22. Open-source toolbox for harmonised analysis of clinical angiography images to support discovery of novel biomarkers <i>Danuta Sampson, Gavrielle R. Untracht, Rolando Matos, Nikolaos Dikaios, Mariam Bapir, Abdullah K. Durrani, Teemapron Butsabong, Paola Campagnolo, David D. Sampson, and Christian Heiss</i></p>

<p>23. Considerations for Open Practices in Quantum Technologies Research <i>Daisy Shearer</i></p>
<p>24. Efficient Audio-based CNNs via Filter Pruning <i>Arshdeep Singh and Mark D. Plumbley</i></p>
<p>25. Promoting Open Research Throughout the Evaluation of the Development of the Burdett National Transition Nursing Network <i>Pippa Sipanoun, Susie Aldiss, and Faith Gibson</i></p>
<p>26. Experience of publishing in Open Research notes journal <i>Paul Stevenson</i></p>
<p>27. Open Research and systematic review on using virtual representations in mHealth application interventions for health-related behaviour change <i>Lauren Taylor, Hannah Ranaldi, Aliya Amirova, Louisa Zhang, Ayan A. Ahmed, and Bridget Dibb</i></p>
<p>28. How Open Research can accelerate the fabrication of solution processed devices <i>Hao-Jing Teng</i></p>
<p>29. Open Community for Food Consumer Science (COMFOCUS) [EU project] <i>Lada Timotijevic, Lisa Mohebati, Charo Hodgkins, Phil Dean, Kathrin Cohen-Kadosh, Monique Raats, Yunpeng Li, and Alireza Tamaddoni-Nezhad</i></p>
<p>30. Associations of active travel with educational and social outcomes in the Millenium Cohort Study: Pre-registering secondary data analyses <i>Ian Walker and Tim Gamble</i></p>

Abstracts for Poster Presentations

(1) Enzymatic Degradation of Polyethylene Terephthalate (PET) Plastic: A Sustainable Approach

Umar Abdulmutalib¹, Juhyun Kim², Manuel Salvador de Lara³, Alice Banks⁴, Claudio Avignone Rossa⁵, and Jose Jimenez⁶

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Introduction

Commonly used plastics are synthetic or semisynthetic polymers derived from fossil fuels, their unique properties offer them resistance to natural degradation (Asmita *et al.*, 2015). PET polymer is composed of terephthalic acid and ethylene glycol chain, which gives it superior barrier properties (Shah *et al.*, 2008), 41.56 and 73.39 million metric tons of PET were produced in 2014 and 2020 (Statista, 2018). Of the one million PET bottles sold every minute, 91% are not recycled, only 6 out of 9% recycled are re-used (Nace, 2017), it takes 400 years for a single PET bottle to naturally degrade.

Methodology

We used molecular techniques to engineer bacteria to produce enzymes active against PET. These esterases were originally identified in actinomycetes (such as *Thermobifida fusca*) and b-proteobacteria (such as *Ideonella sakaiensis*), they were cloned on a broad-host plasmid for expression in *Pseudomonas* and *Acinetobacter*, for use in the biodegradation of pollutants and production of environment-friendly bioplastics like polyhydroxyalkanoates. The expression system used was designed in such a way that different genes of interest could be integrated to overexpress the target enzymes for the degradation, remediation, and or detoxification due to spillages or contamination by petroleum hydrocarbons, its products, or any other targeted pollutant.

Results

We successfully secreted enzymes from our engineered organisms and their activities were confirmed on polycaprolactone polyester as a substrate. The enzymes degrade PET nanoparticles and crystalline films in the subsequent experiments.

Conclusion

PET esterases can be engineered, recombinantly expressed from host strains, and be used to degrade PET plastic. The resulting metabolites could be used as a suitable feedstock for the engineered strains to produce molecules of value. Access to open research information and resources contributed immensely toward the success of this research, to which the outcomes were made public through workshops and conferences in support of research reproducibility and replicability. **Keywords:** Plastic, PET, enzymes, cloning, pollution.

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(2) Exploring Open Research Opportunities to Enrich the Development of a PhD Project

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Introduction/Background

This poster will document my exploration of Open Research activities and practices, with the aim of identifying and incorporating these opportunities to enrich my PhD as I develop the overall project. I would like to document my journey, my thoughts and assessments of relevance and appropriateness for this project, and the benefits as well as costs of implementation of an Open Research approach. An ancillary goal of improving non-academic practitioners' awareness and application of the research might also be met.

Current Proposed Methods

My project seeks to extend research connecting psychological wellbeing with place attachment through a mixed-methods set of four studies. The first study analyses the presence of environmental psychology concepts in practitioner-facing guidance. Study 2 is planned as a qualitative study to explore wellbeing outcomes in, and place characteristics of, local favourite places. Study 3 will likely draw secondary data from the UK Household Longitudinal Study, looking for relationships between neighbourhood belonging and health and wellbeing. Study 4 suggests an experimental study to investigate effects of place attachment on psychological restoration from stress.

Initial Considerations of Open Research Practices Include

Pre-registration for all study designs; a collaborative 'citizen science' approach and online platform for Study 2; connecting the UK Household Longitudinal Study to additional, cross-disciplinary, secondary data might benefit Study 3 and further the application of secondary data. Additional practices may be discovered as the application of Open Research is investigated.

Input and Feedback

What 'best practice' steps for investigation and assessment of Open Research practice have been missed? Any additional resources and strategies to overcome perceived barriers? I am especially interested in Open Research resources addressing interdisciplinary issues related to design and the built environment – have any of these been overlooked?

(3) Open research human transcriptome time series database from sleep and circadian studies for data science, machine learning & biomarker discovery

Simon N Archer¹, Derk-Jan Dijk¹, Carla Moller-Levet², and Emma E Laing³

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Introduction

The development of omics technologies has established large multivariate datasets that can be analysed for associations with multiple behavioural, physiological, and health phenotypes. We adopted and developed omics approaches to study the effect of sleep and circadian disruption on the human blood transcriptome.

Methods

In two clinical sleep studies funded by the American Air Force Office for Scientific Research and the BBSRC, we investigated the effects of sleep restriction and mistimed sleep on the temporal organisation of the human blood transcriptome. Frequent time series of blood samples were collected >24h in both studies and microarray technology was used to measure genome-wide gene expression (transcriptome).

Results

We were the first to comprehensively demonstrate the disruptive effects sleep manipulation on the temporal organisation of the human blood transcriptome (Moller-Levet et al., 2013; Archer et al., 2014). The two gene expression dataset matrices from each study were deposited in the NCBI Gene Expression Omnibus (GEO) database. Further analyses of these datasets by us has established transcriptome-based biomarkers for circadian phase (Laing et al., 2017) and sleep loss (Laing et al., 2019). Specific datasets and machine learning code from those publications was also made publicly available.

Conclusions

Since publication and deposition of the original transcriptome datasets, we have continued to analyse and publish from the data. Importantly, other researchers have utilised the transcriptome data and published findings from them (e.g. Hughey, 2017), or the machine learning code (e.g. Cogswell et al., 2021), or a combination of both (Braun et al., 2019).

Open Research Wins/Challenges/Learnings

Open research dataset availability enables other researchers to further analyse datasets and publish results, providing increased impact for the original research via increased citations. Challenges related to preparing datasets for format compliance, and risk associated with ongoing internal research and competitive external analyses of the same data. We are increasingly aware that projects with integrated, publicly-available databases as an output are favoured.

**(4) Proposed Registered-Report Qualitative Study Submission Titled:
Through the Lens of Developmental Coordination Disorder (DCD/Dyspraxia):
Experiences of a Late Diagnosis.**

Gemma Armstrong¹, Judith Gentle¹, and Marta Topor^{1,2}

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Introduction

In this study we aim to investigate the impact of late diagnosis for individuals with **Developmental Coordination Disorder (DCD/Dyspraxia)**. This investigation is important because, whilst the condition has a prevalence rate of 5%, there is a paucity of research into DCD, and it is recognised as one of the least understood neurodevelopmental disorders. Consequently, many individuals with DCD reach adulthood without receiving a diagnosis and/or appropriate support. The study was developed following a consultation with members of the Dyspraxia Foundation, who highlighted the impact of receiving a diagnosis later in life. We are specifically interested in exploring the emotional impact of a late diagnosis and the individuals' sense of identity, currently and retrospectively.

Proposed Methods

The study will consist of 15 semi structure interviews with individuals who received a diagnosis of DCD aged 30years or later. The data will be analysed using a thematic analysis which will highlight common themes associated with emotions, self-identity and others' perceptions of individuals who received a late diagnosis of DCD. We have submitted this project as a registered report which will allow us to receive peer-review feedback ahead of data collection, this will improve the quality of our study and help to eliminate bias. Although a possible drawback of this approach is that preparation of the study can take some time due to the reviewing stages, a benefit to submitting our study as a registered report is that it will allow us to gain detailed feedback form reviewers.

Open Research Practice

Our study, including protocol and interview schedule will be available on the Open Science Framework. We hope that through sharing our study, this will support further research in this area.

Areas of Feedback

We would appreciate feedback on the efficacy of our research questions and how open research may be used to support professionals working with similar populations, particularly those with neurodevelopmental disorders.

(5) Automatic Analysis 5.8.0: Demonstration of Integrated and Responsive Open-Source Development

Tibor Auer¹, Michael Jones², Ethan Knights³, and Jonathan Peelle⁴

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Introduction

Automatic analysis (aa) allows the construction of complex workflows with great flexibility and convenience by tight integration of tools and the automatic connection of the various steps (termed modules in aa). Additionally, aa emphasize quality assurance by providing relevant diagnostics for steps or participants. Its flexibility also allows the assessment of the numerical instability and the analysis-related variance.

Methods

aa has been developed with an initial focus on MRI. We integrated the EEGLAB and the FieldTrip toolboxes and compiled a new set of modules to extend aa's functionalities to the M/EEG community. We also provided an example workflow based on an openly available dataset to demonstrate the most common use cases.

Targeted projects improved the robustness of aa parallelisation and a self-sufficient deployment by providing documentation and concise examples. We currently work on ensuring aa's compatibility with Windows to support users beyond the *nix ecosystem.

We complemented the existing coordinated development with version control on GitHub with continuous integration (CI) using GitHub Actions and GitHub-hosted runners to facilitate testing and deployment. This solution is freely available and ensures better generalisability because it relies on a generic configuration and environment. The GitHub repository has been linked with Zenodo, which allows DOI assignment and improves visibility and recognition of the project.

Results

The implemented changes improve aa's robustness and offer its benefits for a more diverse community. The improved transparency in the development and the application allows more agile and responsive development while it also reduces the technical debt for contribution and application.

Conclusion

aa became a powerful, versatile, and accessible tool for a growing community.

Highlights

Automatic analysis improves reproducibility and supports a wide range of neuroimaging use cases. GitHub provides a powerful environment for collaborative coding, testing, deployment, and user support.

(6) Open research practices in qualitative research: A beginner's guide

Delia Ciobotaru¹, Delia Lucarelli^{1,2}, Mark Cropley¹, Ines Violante¹, and Roi Cohen Kadosh¹

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Introduction/Background

Rumination refers to negative repetitive thoughts about past experiences, being an important predictor of mental health conditions^{1,2,3}. We will conduct a qualitative study to shed light on what rumination means to people experiencing it and how it affects people's beliefs about themselves and the world. Some qualitative studies have already investigated the role of rumination and its perception in clinical populations including patients with chronic pain⁴ and depression⁵, as well as specific healthy or subclinical populations such as women with marital conflicts⁶ and vulnerable young people seeking mental health treatment⁷. However, no qualitative research has been conducted yet on the relationship between the perceived functionality of rumination and the cognitive and emotional challenges experienced by young adults prone to rumination. A better understanding of such difficulties could play an important role in developing novel, personalised treatments to boost the resilience of this vulnerable population to common mental health conditions.

Proposed Methods

Our qualitative research will consist of semi-structured interviews to better understand the subjective experiences of the participants. We will conduct the study on 25 young individuals (aged between 18 and 35 years) experiencing high levels of rumination, as assessed via the Rumination Response Scale (RRS)⁸. We will transcribe the interviews and then employ thematic analysis to individuate the themes that come up and compile the ideas underlying each theme.

Proposed Open Research Practice(s)

- Qualitative preregistration on OSF⁹
- Open qualitative data
- Sharing the codebook¹⁰
- Publication in an Open Access journal

Areas for Input & Feedback

The use of open data in qualitative research on mental health.

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(7) Physionet ECG database as a resource for pilot studies in cardiovascular research

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Paroxysmal Atrial Fibrillation (PAF) is a cardiovascular condition that causes a patient's heartbeat to be irregular and erratic. Currently the gold standard for diagnosis of PAF is to view an episode on an electrocardiograph (ECG), but due to the paroxysmal nature of the condition often by the time the patient is in hospital the episode has passed. A patient would then be connected to an ambulatory ECG for 1-2 weeks to record any future episodes; however, this can be uncomfortable for the patient. This motivates the need to determine the likelihood of a patient having PAF from a normal sinus rhythm ECG.

The aim of my research is to develop a machine learning tool that uses three analysis methods to predict with a high accuracy if a patient has experienced PAF or not. I intend to use complexity, restitution and symmetric projector attractor reconstruction (SPAR) as part of my model. Each of these have been used individually to predict PAF and other cardiovascular conditions within humans and animals but never as a combination of all three methods.

A machine learning tool's accuracy can be greatly improved by performing cross validation on a large data set, the more data available the better insight we have into its accuracy. However, gaining access to large amounts of ECG signals, particularly PAF, is quite difficult, this is why an open database such as physionet is useful for creating accurate models. It allows us to test the classifications of the models early on so that parameters and methods can be adjusted or changed to improve the overall accuracy.

I would be grateful to receive input and feedback on not only my approaches to using my analysis techniques but also in how I use my open source data to improve the accuracy of my model.

(8) Does wearing a bicycle helmet really increase risk taking and sensation seeking in adults? A registered-report replication

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Introduction/Background

Our 2016 Psychological Science paper suggested wearing a bicycle helmet can lead to higher risk taking and sensation seeking compared to wearing a baseball cap, under the guise of the headwear being the mount for a head-mounted eye-tracker. This paper is open access CC BY 3.0 with data and analysis code available on osf.io. Despite researchers in another lab publishing what amounts to a replication of our original phenomenon, a subsequent commentary in Psych Sci suggested methodological shortcomings; to address these issues we were offered the chance to submit a registered report to replicate our study.

Proposed Methods

In partially replicating our previous study, much of the method remains similar: a between-participants design with the independent variable of protection represented by wearing a head-mounted eye-tracker mounted on either a bicycle helmet or baseball cap, with dependent variables of risk-taking (Balloon Analogue Risk Task) and sensation seeking (Sensation Seeking Scale). To further improve methodology a double-blind design will be used to counter experimenter effects, increased sample size will answer power questions, and hypothesis awareness will be explicitly tested.

Proposed Open Research Practices

The original paper was gold open access with open data. This new replication, in addition to these practices, is a registered report (now accepted): the study is pre-registered, with the results published whether or not the experimental hypothesis is met.

Areas for Input & Feedback

The review procedure for this study was convoluted. Following our own review of the critical commentary (that was itself initially rejected), we were invited to replicate our original study by the editor, who gave the impression of not particularly liking the study at time of publication. Following multiple revisions, the final study methodology is rather unwieldy, almost to the point of being impossible to run. Feedback would be appreciated whether it would be appropriate to reapproach the journal to discuss this.

(9) Simulation of the Risk of Salmonellosis in humans conditional to weather using modelling

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Introduction/Background

The impact of the environment on infectious diseases is commonly accepted but it is difficult to quantify. We aim to evaluate the contribution of the weather variables to the risk of people getting infected with *Salmonella*. This involves working with climate data from the MetOffice and public health data from the UKHSA (previous PHE). Animal population data from APHA will be explored to be included in the analysis.

Proposed Methods

The method requires to link long-term epidemiological and climate/weather data, which can be used to estimate the incidence of salmonellosis conditional to the simultaneous occurrence of certain selected weather variables. The model is validated by comparing the epidemiological records with the simulated incidence. Furthermore, we will test and apply the outcomes of our model by exchanging data and methodology with the University of Utrecht.

Proposed Open Research Practice(s)

We obtained anonymised epidemiological and weather data through direct collaborations with UKHSA and the MetOffice. Weather data are also publicly available¹. We used the UoS Secure Temporal Data Storage to ensure a protected environment for heavy data exchange. Due to the sensitive nature of the data, it took long time to obtain the data. Other type of data were considered (i.e. animal disease data, food consumer patterns), but the complex procedures in place for data sharing and the high cost prevented their inclusion. Once finished, I will publish my codes and simulated dataset in the UoS Open Access Repository² to ensure reproducibility of my research and make it beneficial to the wider scientific community. It would be beneficial to encourage these practices by stronger and explicit recognition from institutions and publishers.

Areas for Input & Feedback

How to promote a trustworthy culture among the general public, stakeholders, public and private sector and convey the message of the importance of data sharing for academic research and its societal benefits.

(10) An Open Research approach to investigating how eye-tracking technology has been used as a tool to evaluate social cognition in intellectual disability

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Eye-tracking technology can provide information about social-cognitive processes, without the need for explicit responses or verbal demands. Here, I present a systematic review investigating how eye-tracking technology has been used as a tool to evaluate social cognition among individuals with an intellectual disability, in which we took an Open Research approach. When I came to pre-register the review, I noticed popular guidance were more focused on intervention and outcome, rather than detailed description of methodology. As the purpose of pre-registration is to facilitate transparency and robustness, whilst constraining reporting bias, I wanted to follow a framework that best suited our review. I used the Non-Interventional, Reproducible, and Open Systematic Reviews (NIRO-SR; Topor et al., 2021) guidelines and framework – a 68-item checklist supporting planning, pre-registering, and reporting of non-interventional studies in systematic reviews. Being able to address each item not only maximised transparency of our review processes, but also meant we began the review with a comprehensive protocol written – supporting efficient and reliable data extraction and synthesis across reviewers. Searches were conducted in PsycINFO, MEDLINE, Embase and Web of Science, and through mailing lists (ID-Research-UK, COGDEVSOC, Dev-Europe). We included both grey literature and peer-reviewed research, as we did not want to overlook the risk of publication bias, and consequently, over-estimate the effectiveness of eye-tracking technology. The review identifies a relatively substantial amount of research; yet variability in eye-tracking protocol and heterogeneity of stimuli used. In addition, studies were often limited by sample size and at times ran exploratory analyses - increasing the potential for sample dependent results and Type 1 error. We recommend presenting protocols transparently, and developing a bank of open-access, validated eye-tracking stimuli, to encourage replication of findings and opportunities for data sharing. Collaborative and open methods will strengthen theoretical and clinical implications regarding social cognition in intellectual disability.

(11) “Well, if they’re an environmental activist, then I should be one too”: A disrupt-then-reframe approach to stimulating pro-environmental intentions.

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Introduction

Social comparison can be limiting to pro-environmental action, as people use the perceived inaction of others to excuse their own inaction. The disrupt-then-reframe (DtR) technique can disrupt thought processes and increase a person’s susceptibility to persuasion. We investigate how participants’ pro-environmental behaviour (PEB) intentions were affected when exposed to discourse attributed to a ‘stereotypical’ vs. ‘atypical’ environmentalist (vs. control). We predict that exposure to the ‘atypical’ environmentalist will render people more persuadable and lead to higher PEB intentions versus the other conditions.

Methods

An online survey was distributed to a sample of the UK population. $N = 222$ (56 men, 164 women, 2 other) were included in the analysis. Participants registered their PEB intentions before reading a text conversation about environmental activism. Participants registered their impression of one of the discussants (Sam), before his identity was revealed. Participants were assigned to either a: ‘businessman’, ‘environmentalist’ or ‘average person’ condition. A photo and description of Sam was included, plus a statement advocating environmental activism. Participants’ PEB intentions, climate change beliefs and ‘green’ identity were then assessed.

Results

The analysis strategy was pre-registered with the OSF. As hypothesised, ‘businessman Sam’ was considered the most surprising discussant, but this did not affect participants’ PEB intentions or climate change beliefs (vs. the other conditions). Interestingly, participants saw ‘environmentalist Sam’ to embody some of the traits of the ‘average’ person.

Conclusions

Our results point towards a positive societal shift, where the average person is considered to be an “environmentalist”. The DtR manipulation failed to produce the anticipated impacts on PEB intentions. Our future research will bolster the surprise associated with the businessman condition and will employ more sensitive measures of PEB intentions.

Open Research Wins/Challenges/Learnings

Pre-registering the analyses made us think more carefully about the rationale underpinning the hypotheses and made the process of analysing the data quicker.

(12) Using open data and code to investigate brain-behaviour relationships

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Introduction

Neuromodulation uses sound, electricity, or magnetism to change how the brain works, with the aim of changing behaviour. However, current neuromodulation technology cannot reach its full potential until there is a mechanistic understanding of how stimulation influences brain network dynamics, and as a result, behaviour. Utilising open data and code, I have developed a pipeline that identifies recurrent patterns of brain network connectivity and their dynamics, as well as measures of complexity. I will then assess how these metrics relate to behaviour across a diverse set of cognitive tasks.

Proposed Methods

The Human Connectome Project (HCP) is an open, high-quality functional magnetic resonance imaging (fMRI) dataset of 1200 young adults resting or completing tasks. Using a subset of 200 participants, we will use open-source code for Leading Eigenvector Dynamic Analysis (LEiDA) to identify the shared connectivity states within and between experimental conditions.

We have made several additions to the LEiDA pipeline, including statistical and algorithmic complexity metrics. Complexity is a measure of entropy and provides clues about the predictability of the brain's dynamics at both the regional and whole-brain level.

Finally, we compare these metrics to each other and behavioural performance metrics to assess which brain metrics, if any, are predictive of task performance. I have created and tested this pipeline on n=60 participants and am now scaling up to n=200.

Proposed Open Research Practices

My study utilises validated open-source data and code; likewise, any additions to the LEiDA pipeline and any papers from this study will be made open access. Further recommendations to increase the openness and replicability of any part of this study are welcome. Collaboration, big data, and open access code are crucial tools needed to understand our brain and effectively utilise neuromodulation for clinical and research purposes.

(13) Fully Open-Sourced Music Source Separation and Speech Quality Enhancement Systems

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Music source separation (MSS) aims at separating different sound sources (e.g. drums, bass) from a mixture audio file, which has several applications such as karaoke and music remixing. Our study proposed a new model to predict complex-valued ideal ratio mask with deep ResUNet architecture and channel-wise subband feature, which is a subband representation that can reduce the computational cost. On the MUSDB18HQ tests, our model achieves an 8.92dB separation performance on the vocal track and an average score of 6.97dB on vocals, drums, bass, and other tracks. In ISMIR 2021 music demixing challenge, our system ByteMSS ranked 2nd in the vocal track and 5th on average score. On following the open-research practice, the training code, pretrained model as well as demo colab is fully open-sourced:

Training code: <https://github.com/haoheliu/2021-ISMIR-MSS-Challenge-CWS-PResUNet>

Pretrained model: <https://zenodo.org/record/5175846#.YjPPTBDP1qt>

Google Colab:

<https://colab.research.google.com/drive/1E2yJLWN8MH6GJUw15cj490E2BaeAcGie?usp=sharing>

Speech quality enhancement is a crucial topic on improving online communication or recorded speech quality, especially after the remote working scheme become popular in recent years. In our work, we proposed a novel speech quality enhancement architecture, VoiceFixer, based on Melspectrogram restoration module and a speaker-independent neural vocoder synthesis module. We found that utilizing the prior knowledge from the pretrained vocoder can facilitate high-quality speech generation, especially on super-resolution tasks. And we found joint performing multiple quality enhancement tasks become feasible on the low-dimensional Melspectrogram. Our proposed system can achieve general speech super-resolution, dereverberation, de-clipping, enhancement, and equalisation in one pass. Objective scoring experiments show that our system has clear advantages over baselines and achieves good restoration quality on real-world test cases. Our training code, pretrained models as well as data sets are publicly available to facilitate open-research practice:

Training code: https://github.com/haoheliu/voicefixer_main

Pip package: <https://github.com/haoheliu/voicefixer>

Google Colab:

https://colab.research.google.com/drive/1HYUeplsl2aXsdET6P_AmNVXuWP1MCMf?usp=sharing

Dataset: <https://zenodo.org/record/5546723#.YjPPnhDP1qt>

(14) The reproducibility EEG checklist: creating a checklist for cognitive EEG studies to promote Open Science.

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The Importance of Open Science in EEG Data

Brain imaging techniques such as electroencephalography (EEG) provide a relatively easy, cost-effective, and direct approach to measure brain function. However, not many EEG datasets are currently available and best practices on EEG data standards and sharing are only recently emerging (Pernet et al., 2019; Valdes-Sosa et al., 2021). This can be partly explained by logistic constraints on voluminous data storage, transfer, and online computational power (Maciocci et al., 2019). Here we aim to provide an 'open research practices' checklist which is easy to follow together with a dataset and analysis pipelines of an experiment investigating the effects of sound on memory.

The Present Study

This dataset uses a classic working memory (WM) delayed match-to-sample paradigm (Berger et al., 2019) with and without simultaneous periodic auditory stimulation targeting the theta frequency range (4-8Hz). Thirty-one subjects (25 females, age range: 18 to 29 years old, mean age 20.9 ± 2.37 SD, 29 right-handed and 2 left-handed) participated in one laboratory session where they were exposed to 5Hz, 7Hz and sham (i.e., no sound) stimulation. Results reveal that different frequencies show different effects on the EEG as well as an increase in theta midline power during maintenance of information in WM (Michels et al., 2008).

Using this Project to Promote Reproducibility

Important steps will be implemented to engage in Open Science practices. Such steps include the standardisation of the EEG and behavioural files into BIDS format (<https://bids.neuroimaging.io/>), sharing of data analyses pipelines including scripts for data analyses and dataset registration to the OSF (<https://osf.io/dashboard>). This dataset could be useful in teaching and research. The proposed checklist can be employed by other labs to improve data sharing and reproducible practices while assisting with ongoing and future multicentre EEG studies such as EEGManyLabs (<https://osf.io/yb3pq/>).

(15) Assessing the impact of LEGO® construction training on spatial and mathematical skills: reflecting on the strengths and challenges of a Stage 1 Registered Report

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There is a known association between LEGO® construction ability, spatial thinking and mathematical abilities. The aim of this study is to determine whether this relationship is causal, by measuring the impact of Lego construction training on Lego construction ability and a range of spatial and mathematical abilities. This study has in principle acceptance as a Stage 1 Registered Report. My unique perspective is that I joined the project as the postdoctoral researcher after the study had received in principle acceptance. I will use this opportunity to describe the strengths and challenges of this Open Research Practice from this personal perspective, as well as in the context of the wider project. For example, the Registered Report allowed for a seamless transition between postdoctoral researchers, as the study protocol and analysis plan were clearly outlined. Conversely, there have been barriers to making changes to the study protocol following piloting, which, due to the pandemic, took place a year after the study received in principle acceptance. I will also describe the study for context. In this study 206 children aged 7 to 9 years will take part in one of three training packages: physical Lego training; digital Lego training; and control training (craft activities). Each training package comprises twelve 30-minute sessions, delivered over a six-week period as a lunch time club in schools. Children will complete tasks before and after the training to measure impact of the training, including: Lego construction ability, spatial skills (disembedding, visuo-spatial working memory, spatial scaling, mental rotation, and a number line task) and mathematical abilities (geometry, arithmetic, and mathematical problem solving). We predict improvement in both spatial and mathematical skills for both Lego interventions, relative to the control condition.

(16) Virtual consultations for people with learning disabilities, their families and healthcare providers: A co-design study to aid implementation in everyday practice. A Study Proposal/ Early-Stage Research

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Introduction/Background

Virtual consultations (VCs) have been around for a while, but initial adoption was not high, and problematic. Implementing VCs in primary care (via telephone/email/video) has been expedited in recent months, but they can widen healthcare inequalities. Little is known about the use of online health services for PwLDs. What evidence exists shows the need to support accessibility for users, by exploring the needs and preferences of PwLD themselves and to develop better guidelines for use.

Aims

To support People with Learning Disabilities (PwLDs) and their families to access and benefit from virtual consultations (VCs).

Proposed Methods

This study will use an experience-based co-design (EBCD) approach. The study comprises of VC observations, interviews and priority and co-design events with people with learning disabilities, their families and healthcare providers (Primary and Community/Social Care Providers).

Proposed Open Research Practice(s)

The central premise of this study is on co-production – working with our health and social care collaborators and experts by experience throughout. Study findings will be used to co-design tangible resources, such as best-practice guidance, training, and support materials to positively change VC experiences and practice for PwLDs, their families and healthcare providers. Our research team, collaborators and experts have worked closely, from study inception to make this study possible. We aim to continue this close partnership through to dissemination of project outputs through various openly available outlets.

Input & Feedback

We would welcome ideas about how to widen our dissemination plans for our project outputs.

(17) Showering Smartly in Tourism Accommodations. A SocArXiv preprint

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Depletion of freshwater is a global environmental threat, increasing with the climate breakdown. Yet water literacy and conservation are still under-researched. Showering is one of the most water-intensive behaviours, also contributing to energy use and carbon emissions. This project aimed at fostering pro-environmental shower behaviour among tourism accommodation guests using smart technology and persuasive messages.

Randomised, covert control trials were developed in seven tourism accommodations from four countries, installing in shower cubicles an innovative smart technology that detects showers through different sensors and informs the user in real-time, via a displayed timer, their shower length. Also, different persuasive messages appealing to personal values were used in combination with the technology. Actual shower duration was unobtrusively collected through the technology, measuring the effect of the behavioural intervention.

Shower duration was found to be 13.56% shorter when the real-time information was provided compared to the control. The messages further reduced duration, with showers 21.27% shorter with the message appealing to selfless values.

This intervention provided shower data about a hidden behaviour. It enhanced the role of personal values in pro-environmental behaviour, contributing to current behavioural change theories. Methodologically, the research used innovative technology for the intervention and data collection. The research fostered pro-environmental shower behaviour, achieved water and energy reductions, and contributed to the Sustainable Development Goals 6, 7, 12, & 13.

This research, the first author's PhD, represents a leaning journey towards Open Research. Through the University of Surrey Open Research training and materials, the first author started to learn the values of openness, collaboration, sharing and transparency in research, now embedded in his way of planning, developing, and communicating research for the benefits of all. This research represents the author's first steps: the study's preprint and the data collected. The data will be available when the peer review process ends.

(18) A systematic review and meta-analysis to quantify weight loss in pancreatic cancer: Challenges using published research based on healthcare data

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Introduction

Pancreatic cancer is rare but has dismal survival rates meaning it is the sixth cause of UK cancer mortality¹. Often presenting with non-specific symptoms, including weight loss, makes early diagnosis when curative treatment is possible challenging. However, because weight loss (often severe) occurs in most pancreatic cancer patients, it could be a useful marker. The study aim is to quantify the pattern (amount and timing) of pre-diagnosis weight loss in pancreatic cancer, improving its utility for early detection.

Methods

A systematic review and meta-analysis of literature to quantify weight loss patterns in pancreatic cancer. Embase, PubMed, Scopus, Web of Science and The Cochrane Library were searched using key words including Pancreatic Cancer and Weight Loss. Observational studies containing quantitative data on pre-diagnosis weight loss were included. Risk of bias was assessed using ROBINS-I². The main outcome was weight loss. This was synthesised separately for each study-type for meta-analysis using standardised mean differences.

Results

40 studies including 15 case-control studies were retrieved. Preliminary findings show that 70-75% pancreatic cancer patients experienced unintentional weight loss six months pre-diagnosis. The odds ratio of weight loss >15% is 15.40 (95% CI, 10.65-22.26). Weight loss is 8.1±0.7 kg with BMI change -1.21 kg/m². Greater weight loss is associated with poorer prognosis.

Conclusions

Quantifying the pattern of weight loss in pancreatic cancer may help clinicians to identify at risk patients. This information could also improve data-driven algorithms designed to flag high risk patients

Open Research Practices

Registered the systematic review protocol on PROSPERO (CRD42022302985). Results will be published open access in a peer reviewed journal.

Open Research Challenges

Reported measurement outcomes lack consistency in units and conventions. Standards for reporting weight loss are required to improve research quality. Transparency is impacted with studies only presenting data graphically and unable to share original datasets.

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(19) A study protocol for the validation of a primary care-based data-driven algorithm to predict pancreatic cancer in the UK setting: Challenges of Open Research using routine healthcare data

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Background

Overall cancer survival has increased over the recent decades, but the dismal survival rates of pancreatic cancer have not changed in the last 40 years¹. This is attributed to late diagnosis as diagnosis is challenging. Data-driven approaches, including prediction algorithms that use a combination of symptoms have been developed to aid earlier detection and diagnosis. One such algorithm is ENDPAC (Enriching New-Onset Diabetes for Pancreatic Cancer)². ENDPAC was developed in the US primary care setting. The aim of this project is to validate ENDPAC for the UK setting.

Methods

A retrospective case-control study using the nationally representative Oxford-Royal College of General Practitioners Clinical Informatics Digital Hub (ORCHID) database will be undertaken. ORCHID holds over 10 million primary care electronic healthcare records including nearly 11,000 people diagnosed with pancreatic cancer (cases). Healthcare records of cases will be compared to matched controls. ENDPAC will be employed to predict pancreatic cancer. Its predictive power will be evaluated using the Area Under the Receiver Operating Characteristic Curve (AUC) analysis.

Conclusions

Routinely collected data are a rich resource that should be used to improve healthcare. However, they are currently underutilised in research due to restricted access as well as privacy and ethical implications. This project will serve as a case study to support the safe and trustworthy use of patient data in research.

Open Research Practices

The study protocol will be published, enabling peer review of methods. The software developed in this project will be deposited in repositories such as GitHub to enable scrutiny and reuse. Only de-anonymised patient records will be accessed to preserve privacy. Results will be published open access in peer reviewed journals.

Open Research Challenges

Datasets that consist of healthcare records cannot be made open access. Only authorised and trained researchers can access this type of data.

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(20) How can Affordance Based Design Improve Collaboration Efficacy in the Workplace to accelerate value-driven Industry 5.0

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Industry 5.0 advocates a more sustainable, human-centric and resilient industry, prioritising and providing the "best conditions for innovation to flourish" (Breque et al., 2021). The research case is a London Borough Council's organisational move to hybrid working in office workplaces and maintenance/repair workshop environments. What value-adding tools in a collaborative hybrid workplace can improve service delivery and staff wellbeing through the application of user-centric Affordance Based Design (ABD) theory (James Gibson, 1966)? Gibson developed the discipline of ecological psychology. "Affordance" refers to the positive or negative relationship of an object to an animal/human within an environment.

How can ABD improve workplace collaboration efficacy?

The research seeks to enable and measure:

- How intuitive, user-friendly spatial design and equipment can improve wellbeing and collaboration.
- Greater workplace cross-functional collaboration.
- How sensors and artificial intelligence can analyse anonymous spatial behaviour, movement, and collaboration analytics in real-time to inform better workplace design.

The mixed-method research applies the ABD method within a convergent parallel design structure. Multiple forms of evidence will provide a "thick description" to increase understanding for an organisation's move toward hybrid working and workplaces supporting greater collaboration. Involvement of all levels of staff will create the engagement factors influencing affordance values and will test the value of human-centric collaboration.

We have prospectively registered our research via the Open Science Framework and over the period of the research, the data will be available on the OSF project page (OSF; <https://osf.io/6tzax>). A data management plan (DMP) will be implemented and maintained throughout the project to simplify and avoid any issues with the sharing of the research outputs as it is shared through collaborative networks and with that in mind, all data will be anonymized. The research follows the FAIR guiding principles (Wilkinson et al, 2016) that the data be Findable, Accessible, Interoperable and Reusable.

(21) Two Decades of Open Data for Language Diversity at the Surrey Morphology Group

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Introduction

The Surrey Morphology Group (SMG) is a world-leading research group in the School of Literature and Languages. Since the 1990s, a key ingredient in the SMG recipe for success has been Open Research language data.

Motivation

In the 1990s, language databases were often created alongside research projects, but weren't made publicly available. The SMG committed to high-value databases that were freely accessible.

Methods

Linguistic databases require analysis of source materials. We ensure users can access the source information that supports our claim. This is a necessary condition for reproducible science, which has now become a high-priority issue. Currently, the SMG maintains 21 web databases, created between 1999 (Surrey Person Syncretism Database) and 2021 (Surrey Lexical Splits Database, among others), including dictionaries with social media interactivity (Nuer Lexicon, Archi dictionary), descriptions of linguistic phenomena, and curated collections of cultural artefacts (The Mian & Kilivila Collection). Their creation has improved access for linguists and community members alike. Today, a priority is enhancing the interoperability of the field's databases beyond the SMG.

Results

SMG is renowned for its outstanding databases, which showcase our excellent research. Around the world, linguists from undergraduates to professors use these resources for learning, teaching and research. Our data is inherently connected by complex relationships, which led to technical challenges alongside theoretical breakthroughs. Early concerns that data would be used without citation were addressed by the systematic usage of DOIs and user-friendly cite buttons. Databases are not on the radar of every committee and ensuring technical continuity has proven a challenge still awaiting a stable solution.

Conclusions

SMG has played a leading role internationally, in promoting Open Research in linguistics. Our pioneering open databases have promoted the idea that such contributions are fundamental to science.

(22) Open-source toolbox for harmonised analysis of clinical angiography images to support discovery of novel biomarkers

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Introduction

Accurate assessment of the microvasculature (the smallest vessels in the human body) could identify biomarkers that lead to a decline in vascular disease mortality. Optical coherence tomography angiography (OCTA) is a non-invasive modality capable of imaging microvasculature, but inconsistencies in data processing protocols across institutions and devices represent a major barrier to progress in applying OCTA to reduce the burden of disease. Our project aims to remove this barrier.

Methods

We have acquired and used OCTA images to develop and optimize a toolbox for OCTA image analysis. We validated the optimized software using OCTA images from different commercial and non-commercial instruments and samples.

Results

We have created an integrated MATLAB – ImageJ toolkit (OCTAVA – OCTA Vascular Analyser) with a user-friendly interface for processing and analysis of OCTA images. Quantitative results from various OCTA images showed that OCTAVA can accurately and reproducibly determine metrics for characterization of the microvasculature.

Conclusions

Wide adoption of OCTAVA is possible and could enable studies and aggregation of data on a scale sufficient to develop reliable microvascular biomarkers for early detection and to guide treatment of and thereby reduce the burden of microvascular disease.

Open Research Wins/Challenges/Learnings

There are no large-scale OCTA data sets yet widely available. Making OCTAVA open access means that it can be further validated via international laboratory and clinical research communities and eventually become standardized software for OCTA data analysis. This would enable building large cross-institution normative databases of the microvascular system in health and disease. Such large data sets will enable defining the most sensitive biomarkers to distinguish between health and disease. Working on OCTAVA we have learnt about various repositories to host data and software for the public, how to prepare documentation for users, and when to consider IP protection in software research.

(23) Considerations for Open Practices in Quantum Technologies Research

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The field of quantum technologies is a fast-paced research environment where new developments are constantly being reported. However, recent controversies -- such as the retraction of a 2018 Nature article claiming to find evidence of the elusive Majorana fermion -- have made me reflect on the research practices of my field and my own practice. When conducting future research, I plan to engage in a variety of open research practices to ensure the reproducibility and transparency of my work, thereby encouraging others in my field to engage with my data, build on it and critically engage with my conclusions.

Regarding my current research, which is due to be published soon, I aim to implement several practices to ensure my data is freely accessible and to facilitate reproducibility and scrutiny of my studies. This will be achieved by publishing under an open licence as well as depositing datasets and code on an open repository such as Zenodo. In future studies, I would like to explore producing a Registered Report alongside publishing an open online lab notebook through my own personal website. This will improve the transparency of my research through the entire process, not just at the time of publication.

Additionally, I aim to engage with the open datasets of others in my field to help foster a culture of shared datasets that different groups will analyse in different ways, extracting more information from results as well as improving the reliability of our knowledge through collaboration. To assess the efficacy of these ideas for open research practices in the field of quantum technologies, I would benefit from reflections on how successful such practices are in other areas, particularly that of analysing the open data of others within the context of my own research topic.

(24) Efficient Audio-based CNNs via Filter Pruning

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Recent trends in artificial intelligence employ convolutional neural networks (CNNs) [1, 2] that provide remarkable performance than other existing methods. However, large size and high computational cost (including training and inference cost) of CNNs is a bottleneck to deploy on resource-constrained devices such as smart phones. Moreover, training CNNs for several hours leads to emit more CO₂. As an instance, a computing device (NVIDIA GPU RTX-2080 Ti) used to train CNN for 48 hours generates equivalent CO₂ as emitted by an average car driven for 20 Km¹.

One of the directions to compress CNNs is by “pruning”, where the unimportant filters are explicitly removed from the original network to build a compact or pruned network. After pruning, the pruned network is fine-tuned to regain the performance loss. In this study, we propose a cosine distance based greedy algorithm to measure similarity among filters in filter space where each filter is approximated using Rank-1 approximations. The proposed work uses following open research practices,

- “Open data”: Experiments are performed on publicly available audio scene classification² dataset and CNN. (Link: https://github.com/marmoi/dcase2021_task1baseline).
- “Open Access”: To reproduce the results, the proposed codes are made available publicly. (Link: <https://gitlab.surrey.ac.uk/as0150/passive-pruning>)³
- “Open Access”: To estimate CO₂ emission, an online available tool is used. (Link: <https://mlco2.github.io/impact/compute>)

The initial analysis suggests the following,

- The number of parameters and the computation speed during inference are reduced by 50% and 30% respectively at approximately 3% drop in accuracy as that of unpruned network.
- Utilizing only 10% of the training dataset (by reducing 90% computation speed during fine-tuning process), the performance of the pruned network can be improved significantly.

In future, the study aims to improve pruned network performance, and to extend the analysis to large networks such as PANNs, VGGish⁴.

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(25) Promoting Open Research Throughout the Evaluation of the Development of the Burdett National Transition Nursing Network

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Introduction/Background

The transition from child into adult services is a crucial time in the health of young people with a long-term health condition, yet processes are disjointed and often fall short of what is required for effective transition. Following the successful development of an exemplar Model of Care for Transition at Leeds Teaching Hospital Trust (LTHT), a National Transition Nursing Network is being implemented across England. A formal evaluation of this quality improvement model for transition will be conducted by a research team at The University of Surrey, in partnership with LTHT, funded by the Burdett Trust for Nursing.

Proposed Methods

A multi-centre concurrent mixed methods design will be utilised with qualitative (interviews/case studies), and quantitative descriptive (surveys) data collected simultaneously over three phases. Participants will include young people, parents, and professionals involved in the young person's transition journey. Phase 1 includes a realist synthesis of the literature to understand what works for whom, under what circumstances during young people's transition from child into adult services.

Proposed Open Research Practices

Promoting Open Research, the study team will work in partnership with lead professionals from the National Transition Nursing Network throughout. This will involve open collaboration on the Realist Synthesis, including early protocol registration, and joint authorship on both the protocol and final realist synthesis publications. Young people will also be instrumental in steering the study, with a Transition Advisory Group already established. Digital newsletters and social media already provide platforms for the sharing of study information with regular updates publicly available on LTHT's website. These platforms will be used to share emerging findings, and new learning, as well as joint, open access publications.

Feedback

Ideas to increase study visibility from the start, and suggestions of methods to share our ongoing findings would be helpful. Suggestions for wider dissemination at the end of the study would be greatly appreciated.

(26) Experience of Publishing in Open Research Notes Journal

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In 2020 Institute of Physics Publishing launched a new journal IOP SciNotes whose remit is to publish brief pieces of work not appropriate for a full-length article, but which would otherwise not be published, and lost to the research record. These could include preliminary results; reproduced results or observations; descriptions of a new method, protocol or data; negative results; or registered methodologies for a planned piece of research. The journal is peer reviewed and open access.

I wanted to support the journal and had just been making use of a major published computer code in a novel way not documented in our original paper. Writing a short research note to describe this method of using the code seemed like an ideal article for the new journal.

The poster describes the process of written, submitting, revising after referees' comments, publication and subsequent impact. The summary is that the paper was published and is now freely accessible to the research community. Without such a route to publication it would be a method and use of the published code that remained unknown. On the other hand, IOP SciNotes is not a well-known journal in my research community, and my paper, on a method in nuclear physics, is somewhat lost in a large sea of articles spanning a very wide range of research areas. Publishing in this way thus requires more active promotion of the work to the relevant community if it is to be noticed.

The published article is "Internuclear potentials from the Sky3d code", P. D. Stevenson, IOP SciNotes 1, 025201 (2020) doi: 10.1088/2633-1357/ab952a

(27) Open research and systematic review on using virtual representations in mHealth application interventions for health-related behaviour change

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Introduction

Many mobile health application interventions include virtual representations of the self (e.g. avatars) to initiate behaviour change. This systematic review aimed to determine: (i) which virtual representations are effective in mHealth application interventions, and (ii) whether any studies implemented specific mechanisms (psychological causes of change) and behaviour change techniques (BCTs) to influence positive behaviour change.

Method

Following PRISMA guidelines, a narrative systematic review of empirical studies was conducted using ten different databases prior to December 2021. This included any published articles published of virtual representation mHealth app interventions that addressed any health behaviours.

Results

Out of 2,579 original hits, five eligible studies (total participants=509), with low to moderate quality were included. Results showed that customisable virtual representation mHealth interventions were effective in encouraging behaviour change and app adherence. These interventions included mechanisms such as motivation, feedback, self-image, and BCTs such as goal setting, and self-monitoring.

Conclusions

The current evidence suggests that virtual representations in mHealth app interventions may positively influence health behaviour change. However, there is limited evidence available to determine to which these influences are the result of the virtual representations themselves or the intervention design.

Open Research Reflections

This review is an open source which will maintain scholarly communication and increase knowledge creation around mHealth and virtual representation research as it includes a pre-registered protocol, publicly available data, protocol and has been submitted to an open access journal that has been newly established. However, there are limited opportunities to promote the benefits of sharing data in repositories for easy access, storage, and preservation. There is also a lack of guidance around preferred formats to present research content and data fairly.

Keywords: Systematic review; Open Research; mHealth; Applications; Intervention; Virtual representation; Avatar

(28) How Open Research Can Accelerate the Fabrication of Solution Processed Devices

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The future of electronics lies in developing sustainable and inexpensive fabrication techniques to cope with the growing interest for flexible electronics [1]-[4]. Solution processing is promising area of interest due to its low cost, and ease of fabrication compared to conventional methods of fabricating thin-film transistors (TFTs)[5][6].

Searching ‘solution processed TFTs’ on Web of Science will yield over 1000 results, only 133 of which are open access [7]. With less than 13% of research being open access, it can be challenging for new ideas, materials, and processes to gain momentum to accelerate optimization of solution processed devices. Although solution processing aims to become a greener alternative to other methods of fabrication, it is not widely known about, suggesting that the research is not yet open enough to the public and other relevant groups. This can be rectified through publishing in open journals and sharing research through public channels. There is a growing trend of scientific communicators sharing ideas and research in short form videos which is an easy way to share research to the public in a fun and engaging manner [8]. Publishing in open access journals can allow researchers from other fields to contribute to the topic by lending their expertise and generating new avenues of research. Open access papers generally have larger impact as they are more likely to be picked up by websites and news outlets, leading to greater interest on the topic [9]–[11]. During the poster session, it would be beneficial to receive feedback on how others in this field have been able to safely disseminate their research in an open manner whilst protecting intellectual property and patents. Input on how to best share ongoing research to the public would help shape the future of this research.

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(29) Open Community for Food Consumer Science (COMFOCUS) [EU project]

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Background

The current food system has reached a crisis point, producing a range of undesirable outcomes such as health inequalities, obesity, loss of biodiversity, and environmental degradation. Understanding food consumption and people's relationship with food is a major step towards food systems transformation. Food consumer science is addressing this problem as a discipline that aims to understand how people come to learn about, desire, acquire, use, and dispose of foods, food products and services, and activities available in the marketplace to satisfy their needs. However, food consumer science is currently fragmented, its data are scattered and its approaches insufficiently harmonised, which impacts its ability to deliver impactful results.

Open Research Practice

The European project COMFOCUS mission is to advance the open food consumer science community beyond its current level of fragmentation that prevents it from being a user-relevant data-rich science it could be in support of healthy food choice public policies and private strategies. The project is developing a research infrastructure that will enable **open access to institutions and COMFOCUS Knowledge platform; open data that will be standardised and comply with FAIR and RRI standards; and open community** fostered through networking and long-term strategy for European behavioural and social scientists interested in people's relationship with food.

Open Research Method

It brings together social and computer scientists to harmonise constructs, measurements and develop standards for new modes of research. It will develop data structures, ontologies and services for data extraction, as well as appropriate data governance approaches. This will facilitate open food consumer science through open data, open protocols, open facilities and open knowledge.

Suggested Input

COMFOCUS would like to receive input on: developing open data management/data governance practices; how to open up the labs and facilities within Surrey; technological know how to enable external researchers to utilise the Virtual Reality (XR) lab.

(30) Associations of active travel with educational and social outcomes in the Millennium Cohort Study: pre-registering secondary data analyses

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Introduction/Background

Previous work has hypothesised that the way children travel to school might have impacts on their educational and social outcomes. Our main aim is to explore this hypothesis by predicting school exam results at age 17 from how children travelled to school at ages 7, 11 and 14.

Proposed Methods

Using secondary data from the Millennium Cohort Study, our analysis is partly based on a recent study focused on physical health outcomes rather than psychological and social outcomes. We will control for several potential confounders and moderators (demographic variables, socio-economic status, geographical features of the home-school journey) with subsidiary analyses looking at secondary outcomes including scores on the Strengths and Difficulties Questionnaire, a measure of wellbeing, and a measure of environmental concern.

Proposed Open Research Practice(s)

In Psychology, preregistration of hypotheses, methodology and analysis is becoming more common place, especially in relation to the collection of original data. This practice can be useful for the analysis of secondary data, especially to avoid hypothesising after the results are known (HARKing). Here, we have pre-registered our research questions and hypotheses on osf.io, clearly stating which variables are going to be used, and declaring any prior knowledge of the dataset. Crucial aspects of the analysis plan are also defined, such as the statistical models being used, the effect size of interest, statistical power thresholds, inference criteria, how violations of assumptions will be dealt with, how reliability and robustness is tested, and what exploratory analyses are planned.

Areas for Input & Feedback

We would welcome discussion about experiences with others who have used open research practices when analysing secondary data.