**NDAS19 Workshop, Friday 21st June 2019**

**Open science, Power and Reproducibility in Neurodevelopmental Disorder Research.**

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**Workshop Schedule**

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| **Time** | **Event** |
| 9.00 | Registration opens  *(LT block, lower open concourse)* |
| 9.15 | Welcome: Emily Farran  *(Lecture Theatre E)* |
| 9.20 | Power in Neurodevelopmental Disorders.  *Hannah Hobson*  *(Lecture Theatre E)* |
| 10.00 | De-mystifying Bayes, and its use for understanding null results.  *Harry Purser*  *(Lecture Theatre E)* |
| 10.40 | Coffee  *(lower open concourse)* |
| 11.10 | The Discover Network: an example of the role research funders can play to improve the reproducibility of research.  *Lorcan Kenny*  *(Lecture Theatre E)* |
| 11.50 | Registered Reports, Transparency and Reproducibility in Developmental Research.  *Hannah Hobson*  *(Lecture Theatre E)* |
| 12.30 | Lunch  *(lower open concourse)* |
| 1.30-2.30 | Computer room practical session 1  Using JASP for Bayes analyses.  *Harry Purser*  *(39 AD 04)* |
| 2.40-3.40 | Computer room practical session 2  An introduction to the Open Science Framework.  *Hannah Hobson / Marta Topor*  *(39 AD 04)* |
| 3.50-4.30 | Computer room practical session 3  How to plot individual differences in R (pirate plots: <https://www.r-bloggers.com/the-pirate-plot-an-r-pirates-favorite-plot/>).  *Marta Topor*  *(39 AD 04)* |
| 4.30 | End of Conference |

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# Workshop Abstracts

**Oral presentations**

**Power in Neurodevelopmental Disorders**

*Hannah Hobson*

Developmental psychology, and the study of developmental disorders in particular, is a field that is arguably likely to suffer from issues of reproducibility, due to generally quite small samples sizes and large heterogeneity, both of which will impact negatively upon a study’s power. To investigate this issue, studies were drawn from 48 meta-analyses concerning developmental disorders, conducted on a variety of topics and populations (including ASD, DLD, ADHD, and dyslexia). Post-hoc power of the effect size was calculated for the included individual studies, based on the meta-analytic effect size. Median power was .64, below the general desired standard of 0.8, but comparatively better than power reported for other fields, such as neuroimaging. The relatively higher power of developmental disorders research may be due to the typical effect size obtained in studies comparing typically developing children to developmental disorder groups.

**De-mystifying Bayes, and its use for understanding null results**

*Harry Purser*

The aim of this talk will be to explain Bayesian reasoning and analyses without any complex maths or obscure symbols. The emphasis will be on what Bayesian analyses can do for your research, with a particular focus on using these analyses to test whether means are the *same as each other*, rather than different from each other. Topics will include group matching and comparing cognitive profiles between disorders.

**The Discover Network: an example of the role research funders can play to improve the reproducibility of research**

*Lorcan Kenny*

As a research funder, Autistica works to ensure every autistic person has the chance of a long, happy, healthy life. Key to achieving this mission is ensuring not only that we fund the best autism science but also that we ensure the best autism scientists are committed to making science reproducible, efficient and accessible. One initiative run by Autistica to this end, is The Discover network ([autistica.org.uk/discover](https://eur02.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.autistica.org.uk%2Fdiscover&data=02%7C01%7Ce.farran%40surrey.ac.uk%7Cc76d2e7ec864421588ca08d6aef39a67%7C6b902693107440aa9e21d89446a2ebb5%7C0%7C0%7C636888758637575750&sdata=5nqdYRE8sLb4GyYVqKEWwMSm7t7DCYaqr43VVJdiFvc%3D&reserved=0)) which is the first national autism research network in the UK. Through Discover and the Autistica-funded Autism Spectrum Database UK (ASD-UK), we have built a large network of autistic people and other interested community members keen to engage with research and share their lived experience. This unique infrastructure makes it quicker and easier for researchers to include the right people in their research and importantly makes it feasible for researchers to recruit large enough samples to conduct rigorous research. Autistica is committed to building on this commitment by ensuring it leverages its influence as a research funder to reward researchers who are committed to reproducible research practices and to support autism researchers to work as efficiently as possible to ensure that autism research has impact that goes beyond the lab and into the real world.

**Registered Reports, Transparency and Reproducibility in Developmental Research**

*Hannah Hobson*

“Registered Reports” are an innovative publication method, in which research reports are reviewed and “accepted in principle” prior to data collection. Their main aims are to reduce publication bias and “grey research practices” (e.g. p-hacking, HARK-ing). There has been much discussion about the potential of registered reports for biomedical research generally, but how does this approach apply to developmental research? In this talk, the process, benefits and challenges of conducting registered reports will be considered, including specific issues that apply to researchers wanting to use registered reporting for developmental research.

This presentation will be followed by an **introduction to the registered report submission process at the British Journal of Developmental Psychology**, by Editor, Harriet Tenenbaum.

**Computer practical sessions**

**Using JASP for Bayes analyses**

*Harry Purser*

This session will show you how to use JASP, a simple and free program that allows you to perform Bayesian versions of many standard analyses, such as ANOVA, *t*-tests, and correlations. Although not essential preparation, it might be helpful to attend the earlier session on de-mystifying Bayes before coming to this practical workshop. Data will be provided, but please feel free to bring your own along.

**An Introduction to the Open Science Framework**

*Hannah Hobson / Marta Topor*

The session will open with a short talk about the open science framework (OSF) to explore its components and benefits for researchers. The practical session will cover the basics of creating an account and navigating through the contents. Thus, it will be a good introduction for those who have very little or no experience in using the OSF. The goals of the session will be to create a new project, create a draft registration and learn how to use the preprint service.

**How to plot pirate plots in R.**

*Marta Topor*

This short session will aim to introduce a fancy way of plotting data using R. Pirate plots are a more comprehensive version of box plots as they combine raw data, descriptive statistics and inferential statistic in a concise and elegant way. During the workshop a sample of data will be provided along with the code and the steps for making the pirate plots will be covered. Therefore, the session might not be suitable for R beginners.

Workshop preparation: It would be useful if you could attend the Open Science Framework workshop beforehand as you will need to access files from the OSF. Otherwise, please make sure you have an OSF account set up before joining the workshop.