# Open Research Case Study

## Embedding Open Research Practices in Psychology through Undergraduate and Postgraduate Teaching

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Since joining Newcastle as a Teaching Fellow in 2018, I have worked hard to embed aspects of Open Research throughout my teaching and research within the School of Psychology. I challenged myself to develop my skills and knowledge further by attending the 2019 Oxford|Berlin Summer School on Open Research (University of Oxford), where I learned about effective ways to embed Open Research practices within my teaching, an have taken proactive steps to encourage others to do so as well. For instance, I delivered a session for the Behavioural Sciences and Psychology [BSP] theme Seminar Series (2021) on implementing Open Research within teaching in undergraduate and postgraduate psychology, developed lectures that I deliver at undergraduate (PSY3048, PSY3097) and MSc (PSY8061) levels to address the fundamentals of Open Science and how to embed these within student research projects, and have co-authored a peer-reviewed journal article outlining '10 Simple Rules' for Early Career Researchers.

Arguably the area in which I have had most success in implemented Open Research is undergraduate and postgraduate project supervision. I pre-registered the hypotheses/analysis plan for the first undergraduate project I supervised, shared the data publicly on my [Open Science Framework page](#), and, along with my students, published an Open Access peer-reviewed journal article resulting from the work (for details, see Table 1[BSc project from 2018]). I found this to be a very rewarding endeavour and have adopted this model in subsequent years. Not only has this led to a considerable degree of success as regards publication of research findings (see Table 1), but, importantly, it also helps provide the next generation of researchers with training in open and reproducible methods and practices. This, therefore, helps drive change, improving the quality of research conducted in the future as well as that which is produced today.

Successful implementation of Open Research practices within student project supervision led to my being invited to take on the role of Module Leader for PSY3097 (Empirical Project). For this, I liaise between students (N = 271) and supervisors across the School of Psychology (n = 34), Biosciences (n = 12), SAGE (n = 1), School of Pharmacy (n = 2), Translational and Clinical Research (n = 4), and Population Health Sciences (n = 15) to coordinate the module. I allocate students to supervisors based on their shared research interests/preferences, advise supervisors on the processes involved, and apply the knowledge and experience I have gained to engage and encourage students and supervisors on the implementation of Open Research practices. For instance, theintroductory session for this module now includes an overview of the "Great Eight" aspects of Open Science (e.g., data sharing, pre-registration, journal clubs, pre-prints), and how these might be embedded within undergraduate projects. To try to inspire students further, I also provide examples of previous undergraduate projects that have utilised open methods and practices, and which have led to publication in peer-reviewed journals.

I also embed aspects of Open Research within other modules within our undergraduate and postgraduate programmes. For instance, through my teaching in statistics at BSc (PSY3048) and MSc levels (PSY8061), I support students to develop open and reproducible techniques for data analysis by encouraging them to learn to use the statistical programming language R and/or to work with SPSS syntax.

Rather than doing so abstractly, I apply these ideas to current issues within psychology, and, in particular, to the 'Replication Crisis'. By providing clear links between the challenges faced (e.g., publication bias), and how we might address these (e.g., via Open Research principles), my hope is that my students are motivated to take this forward and to improve the quality of current and future research within psychology.

| Year | Level | Project | Open Science Frame-work links | Peer reviewed publication(s) | Student co-authors on publication |
|------|-------|---------|-------------------------------|------------------------------|-----------------------------------|
| 2018 | BSc | Autistic traits, disordered eating, and anxiety and depression | Pre-registration<br><br>Open data/code | *Journal of Autism and Developmental Disorders* | Alana Barnett (first author)<br><br>Katie Edwards<br><br>Rebecca Harper |
| 2018 | MSc | Autistic traits in medical students | Open data/code | *SAGE Open* | Emma Turner (first author) |
| 2018 | MSc | Autistic traits, empathizing-systemizing, and gender diversity | Open data/code | *Endocrine Practice*<br><br>*Archives of Sexual Behavior* | Olivia Hendriks (first author on paper on paper in *Archives of Sexual Behavior*)<br><br>Yimeng Wei |
| 2019 | BSc | Tattoos, personality, and individual differences | Pre-registration<br><br>Open data/code | *Early Human Development*<br><br>*Personality and Individual Differences* | Tinisha Osu (first author on paper in Early Human Development)<br><br>Miles Newman<br><br>Julia Lechler-Lombardi<br><br>Amy Butler |
| 2019 | MSc | Assortative mating, autistic traits, empathizing-systemizing, and digit ratio (2D:4D) | Pre-registration<br><br>Pre-print<br><br>Open data/code | *Early Human Development*<br><br>*Scientific Reports* | Ben Mellor (author on paper in *Scientific Reports*) |
| 2019 | MRes | Amniotic cortisol and fluctuating asymmetry | Pre-registration | *Evolutionary Biology* | Will Bushell (first author) |
| 2020 | BSc | Assortative mating, theory of mind, and dark triad traits | Pre-registration<br><br>Preprint<br><br>Open data/code | *Journal of Social and Personal Relationships*<br><br>Manuscript under review at *Journal of Personality* | Emily Jackson (first author on paper in *Journal of Social and Personal Relationships*)<br><br>Hannah Proctor |
| 2020 | MSc | Autistic traits, disordered eating, and muscle dysmorphia | Pre-registration | *PLoS ONE* | |
| 2021 | BSc | Is the correlation between autistic traits and borderline personality traits moderated by sex? | Pre-registration<br><br>Open data/code | Manuscript under review at *Personality and Individual Differences* | Sally Kelly |
| 2022 | BSc | Are friendship dyads and same-sex romantic partners more similar than chance for autistic traits, empathizing, systemizing, and the dark triad? | Pre-registration | Manuscript in preparation | |

Table 1. Implementation of Open Research within undergraduate and postgraduate project supervision.