

## TS 2000 Study Annual Newsletter 2017-2018

### **Hello everyone!**

It's been just over a year since we were last in touch, so we would like to update you on our progress on the TS2000 study and associated projects. Thank you for your ongoing participation in the study!

### **Phase 3 is nearly complete!**

We have almost finished Phase 3 of the study, which we started in early 2016. The aim of Phase 3 was to investigate brain activity patterns associated with different outcomes in TS, such as autism spectrum disorder (ASD), epilepsy, attention-deficit/hyperactivity disorder (ADHD), and intellectual difficulties. We used EEG to record electrical brain activity ('brain waves') from electrodes on the head. We also used eye-tracking, computer tasks, puzzles, and play/conversation-based tasks to investigate cognition and behaviour associated with the brain activity we recorded.

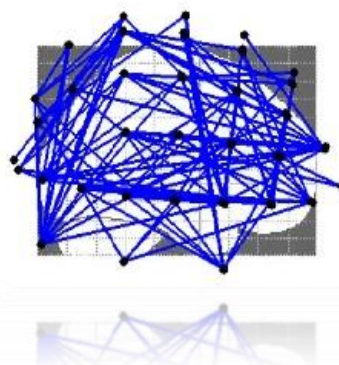
We invited all families to visit us in London to take part in the Phase 3 assessments and we had a brilliant response – almost 50 families made the (sometimes very long!) trip down to see us. We are very grateful for the effort everyone made, thank you.

### **Preliminary findings from Phase 3**

The researchers on Phase 3 are now working hard to process and analyse all of

the EEG, eye-tracking, and cognitive task data. Lizzie Shephard, the postdoctoral researcher who was in charge of running Phase 3, has conducted some preliminary analysis of the EEG data. She has been looking at brain 'connectivity' – that is, the extent to which different brain regions are connected with each other. In a subsample of participants with TS (15 participants)

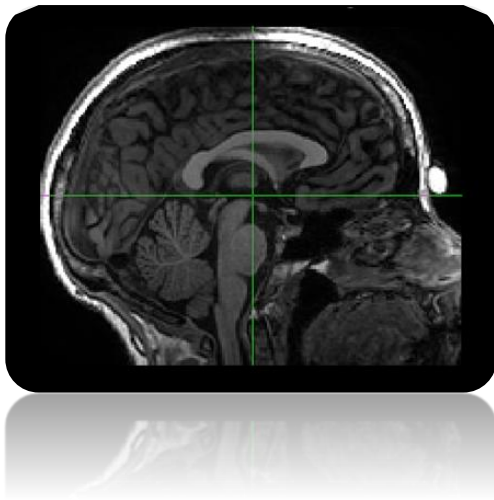
Lizzie found that hyper-connectivity (excessive connectivity between brain regions – like in the image below) was associated with higher levels of ADHD symptoms, and less severe epilepsy. She is now processing the EEG data from the rest of the participants and working on writing up these findings for publication in scientific journals.



This image shows the connections (lines) between the EEG electrodes on the head. The more connections (lines) there are, the more connectivity there is in the brain.

### MRI brain scans

Alongside Phase 3 we have been running some state-of-the-art MRI brain scans with some participants with TS and some young people of the same age without TS. Aside from some issues with our MRI scanner not working very well for a few months (!! ) we collected some very high quality brain images – you can see an image of Lizzie’s brain in the figure below!



We will be analysing these MRI scans over the next few months.

We are also hoping to begin scanning some participants with TS under general anaesthesia. If you or your son/daughter would be interested in taking part in scanning with or without general anaesthesia, please contact the research team on [ts2000@kcl.ac.uk](mailto:ts2000@kcl.ac.uk) and we can discuss this further with you.

### Our research team

We are saying goodbye to some members of the team and hello to others. Dr Lizzie Shephard has been awarded some funding of her own and will be leaving the team in February 2018 to work in Brazil, where she will be investigating effects of different environments and cultures on children’s brain development.

Dr Anna Combes will be joining the team in March 2018 to take over from Lizzie. Anna has expertise in conducting MRI scans and MRI data analysis and will be analysing the MRI scan data.

Dr Tauseef Mehdi has also recently joined the team – Tauseef is a consultant child and adolescent psychiatrist and will be helping Anna with some of the MRI scans, including the scans we hope to do under general anaesthesia.

### Contact details

If any of your contact details have changes we would appreciate if you could drop us an email on [ts2000@kcl.ac.uk](mailto:ts2000@kcl.ac.uk) to let us know so that we can update our database.

### Thank you!

Once again, we would like to thank you for all of your hard work taking part in the TS2000 study.

With best wishes,

**Professor Patrick Bolton & the TS2000 Study Team**

**Professor of Child and Adolescent Psychiatry and Honorary Consultant, Institute of Psychiatry, Psychology, & Neuroscience, King’s College London.**