Theirworld

Edinburgh Birth Cohort

Spring 2020

Welcome

A warm welcome to this latest edition of the TEBC newsletter! We are delighted to welcome several new staff and students who have joined us.

The TEBC annual party took place in May which is our opportunity to say a big thank you to all the families who help with the research. Our biggest party so far and wonderful to catch up with so many families!

Finally, we feature research that is using baby brain scan images to describe how the brain develops in early life.

We hope you enjoy reading this edition of the newsletter!

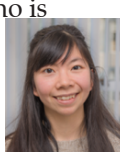
News

- Goodbye to **Gillian Lamb**

  In April we said goodbye to Gillian our research midwife. Gillian had been with TEBC for nearly three years and in that time made a huge contribution to ensuring the success of the study. We wish Gillian well in all her new adventures!

Welcome to:

- **Gill Black**. We are delighted to introduce our new research nurse, Gill Black. Gill joined the study in June and is busy recruiting families to the study. You can find out more about Gill in *'Who's Who'*
- **Yu Wei Chua**. Yu Wei is a PhD student who is studying baby movements at 9 months and how this links to their learning and behaviour as they grow.



- **Kadi Vaher**. Kadi is a PhD student who is studying the stool (poo) samples that we collect from the babies before they go home from hospital. She plans to investigate the links between the bacteria found in their stools, brain development and behaviour (such as attention, social behaviour and temperament).

- **Party**

  Back in May we hosted our third annual TEBC party. This year was our biggest yet! We had a wonderful time catching up with all the families in our study. The Scottish sunshine even made a rare appearance, and we made use of the big garden and had lots of fun games outside. Everyone loved our visiting animal wrangler and all his furry and scaly friends. There were lots of crafts for our older children and plenty of fun sensory play for our infants. It was lovely to see our vibrant TEBC community catching up over plenty of tea and cake.

- Earlier this year **James Boardman** gave his inaugural lecture since being appointed to the position of Professor of Neonatal Medicine. The lecture provided a fascinating insight into the study of the developing human brain.

You can see James's lecture here>

- Congratulations to TEBC investigator **Dr Sue Fletcher-Watson**, who has been appointed as the new director of the Salvesen Mindroom Research Centre for Learning Difficulties. The Centre, which is part of the University of Edinburgh, undertakes research to improve the lives of children with learning difficulties and their families. Sue works with the TEBC team to manage the follow up assessments that families attend when children are aged 9 months, 2 years and 5 years.

Find out more here>

News (continued)

Dr Sue Fletcher-Watson

- **PAS conference**

  Back at the end of April, a few of our researchers attended the Pediatric Academic Societies (PAS) meeting in Baltimore, Maryland. PAS is a large conference that brings together thousands of paediatricians, health care providers, and researchers.

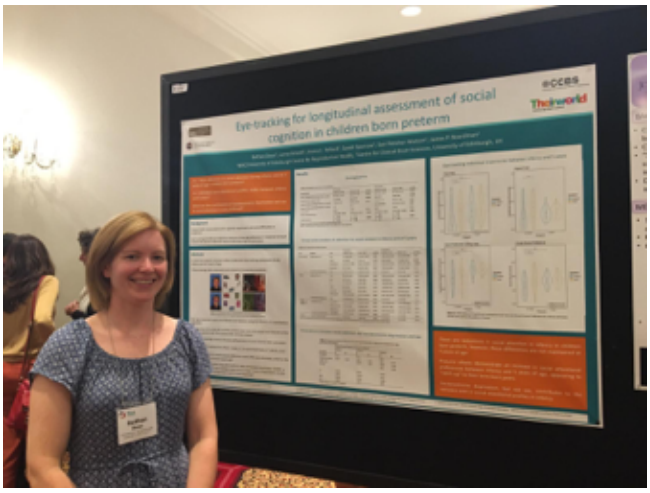
  There are hundreds of amazing talks and seminars all relating to child development and child health. It was a great opportunity to learn about other work happening around the world, and to share some of the important work happening through the Theirworld Edinburgh Birth Cohort. Paola Galdi (TEBC computer scientist) gave an excellent presentation using the TEBC baby brain scans to describe brain development in early life. You can read more about Paola's findings in this newsletter under 'Research Findings'

Left to right: James, Bethan, Sinead, Gemma, Manuel and Paola.

- **FLUX conference**

  In August, TEBC researchers Bethan Dean and Lorna Ginnell attended the 7th annual Flux Society conference (Flux: The Society for Developmental Cognitive Neuroscience). The conference took place in New York and they presented their work using eye-tracking to measure thinking and social skills in our TEBC babies. Some of these skills are thought to develop more slowly in babies who are born too early but they are difficult to measure in young infants who can't perform the tests that we would use with older children. Eye-tracking is one way to test these skills in young babies.

  Bethan's research looked at development of social skills. She presented her findings that at 9 months, preterm babies were less interested in looking at the parts of pictures that convey social information (such as the eyes) than babies born at their due date (term). However, by 5 years of age she saw that preterm children showed equal interest to this social information as children born at term. This suggests that although preterm infants show a slight delay in this measure of social development in infancy, they appear to catch up by 5 years of age. Bethan is now looking at how this eye-tracking measure relates to other measures of social development we are collecting from our assessments and parent-child play at TEBC appointments.



Bethan with her poster at the Flux conference.

Who's who

Gill is a research nurse who joined the team in June 2019.

Gill trained as an Adult and Paediatric nurse in Edinburgh before spending 20 years working in Critical Care at Queens Medical Centre, Nottingham. Specialising in neonates at Nottingham University and laterally worked as a Practice Development Nurse on the neonatal intensive care unit. The photo right is her getting ready for the annual Teddy Bears' Picnic!

Gill moved back to Edinburgh in 2017 to pursue a career in research and worked in the Sick Kids Hospital prior to her new role with the University.

She is enjoying getting to know the participants and their families. The staff on Labour Suite, post natal wards and the Neonatal Unit at Simpson's have been welcoming and accommodating which has helped her settle in to the role.

Research

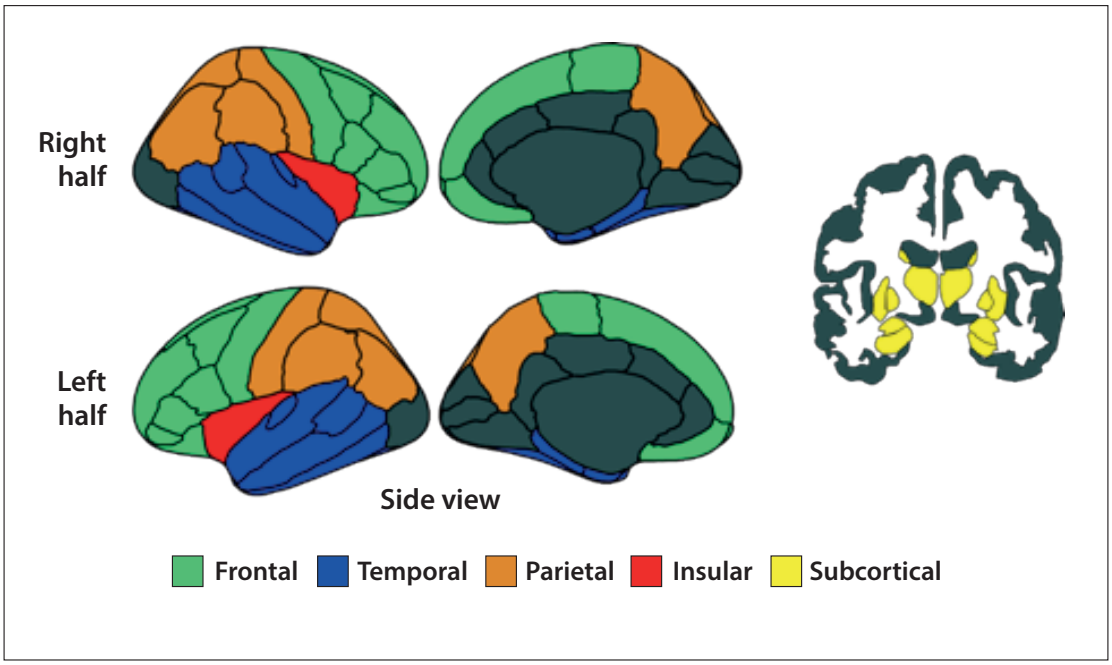
Combining brain imaging data to describe brain development in early life

All people are different, and so are our brains. Through magnetic resonance imaging (MRI) we can acquire different types of brain images describing several aspects of the new-born brains: from the macroscopic level (e.g., how big a brain is) to the microscopic level (e.g., how water molecules move in brain tissue). Putting together all the information that we acquire from MRI scans, we can obtain a "fingerprint" describing the unique properties of an individual's brain. To do so, we used a model called morphometric similarity networks (MSNs), that builds such a fingerprint by measuring how brain characteristics vary across different regions of the brain.

Using data from 105 neonates of the Theirworld Edinburgh Birth Cohort (59 preterm and 46 term), we applied this model to investigate how much of the variability that we see between baby brains can be explained by age differences, and to measure the effect of being born preterm.

What we found was that in the first weeks after birth most changes involved subcortical and fronto-temporal areas of the brain (the yellow, green and blue areas in the picture). When we compared preterm and term-born babies, the differences we observed were located mainly in frontal, parietal, temporal and insular regions (the green, mustard, blue and red areas in the picture). In the future, we plan to link these findings to the behavioural data collected at the follow-up assessments, to see if the differences that we observe in brain development in early life are related to behavioural differences in childhood.

Link to full paper: https://doi.org/10.1016/j.nicl.2020.102195



TEBC in numbers…the story so far

313 Families Recruited

242 Follow Up Appointments

Huge thanks to all the families who help with our research! Without them, none of this would be possible.

141 Umbilical Cord Blood Samples

204 Placentas

Looking at the placenta under the microscope and running blood tests on umbilical cord blood can provide information about your baby's development in the womb.

119 Stool Samples

Stool (meconium and faeces) contain lots of bacteria. The number and type of bacteria in stool is important for long term health. We want to find out the effect of preterm birth on these bacteria, and whether it matters for babies in the long run.

382 Nose Swabs

Preterm infants are in general more susceptible to infections of the breathing system in infancy and childhood. This may be due to differences in ability to fight infection in nasal secretions. We plan to test whether immunity in the nose is altered in preterm infants and also whether they have altered bacterial communities in their noses that might be less capable of fighting ill-making bugs.

270 Saliva Swabs

A person's "genetic make-up" may be defined as the molecules in our bodies that we inherit from our parents, which help determine who we are, and how our body grows and develops. This information is held in a 'code' that exists in the cells of our body, called DNA. The exact way in which that code works is influenced by another set of molecules in each cell called the epigenome. Both types of genetic information can be obtained from cells that are present in baby saliva.

221 Brain Scans

We are collecting brain scans from MRI from premature babies and babies born at full term so that we can find out what leads to altered brain development for some babies. In this way we hope to develop ways of helping children in the future.

60 Hours of eye movement

The project is using an eye-tracker to measure what babies and young children prefer to look at. This can give us an insight into how their brain works and what they are learning. We're interested in whether the information we get relates to other information, like brain scans. We also want to know whether we can tell the difference at this young age between babies who later do, or don't, develop learning problems.

37 Hours of Parent-Child Play video

Having a record of how your baby behaves in a more natural setting is incredibly useful. We can look back at these videos to explore all sort of things, like early signs of language (i.e. babbling), play skills and motor behaviour – the way your baby moves.

20 Hours of Still-Face Video

As well as seeing how your baby plays in a natural setting, we are also interested in how they behave in unusual or unexpected situations. Looking at how your baby reacts to being ignored (when a parent holds a 'still face') can tell us about how they respond to stressful situations and how they express and regulate their emotions.

150 Minutes of Movement Sensor recording

While you are playing with your baby, small wearable sensors are attached to your baby using special clothing. These sensors allows us to measure your baby's movements as you are playing.

Contact Details

Jill Hall (*Study Coordinator*)
Telephone: 0131 242 6602
Email: jill.hall@ed.ac.uk

Victoria Ledsham
(*Research Assistant*)
Telephone: 01315316289
Mobile: 07584 642 277
E-mail: Victoria.Ledsham@ed.ac.uk

Gill Black
(Research Nurse)
Telephone: 0131 242 6602
Email: gill.black@ed.ac.uk

Website: www.tebc.ed.ac.uk
Twitter: #TheirworldEBC