Towards a translational developmental neuroscience of autism

Emily Jones
2012-

Terje Falck Ytter
Grainne McAlonan
Luke Mason
Mark Johnson
Tony Charman
Jan Buitelaar
Chantal Kemner
Przemek Tomalski
Herbert Roeyers
Petra Warreyn
Rianne Haartsen
Anna Gui
Jannath Begum
Ayesha Javed
Chloe Taylor
Rebecca Harrison
Emma Meaburn
Judit Ciarrusta
Sarah Lloyd Fox
Ricarda Braukmann
Par Nystrom
Rob Leech
Sara Webb
The STAARS, Eurosibs, Zebra. SPARCS, BIBS and EASE teams

This project has received funding from the Innovative Medicines Initiative 2 Joint Undertaking under grant agreement No 777394. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and EFPIA and AUTISM SPEAKS, Autistica, SFARI.

Why Autism?

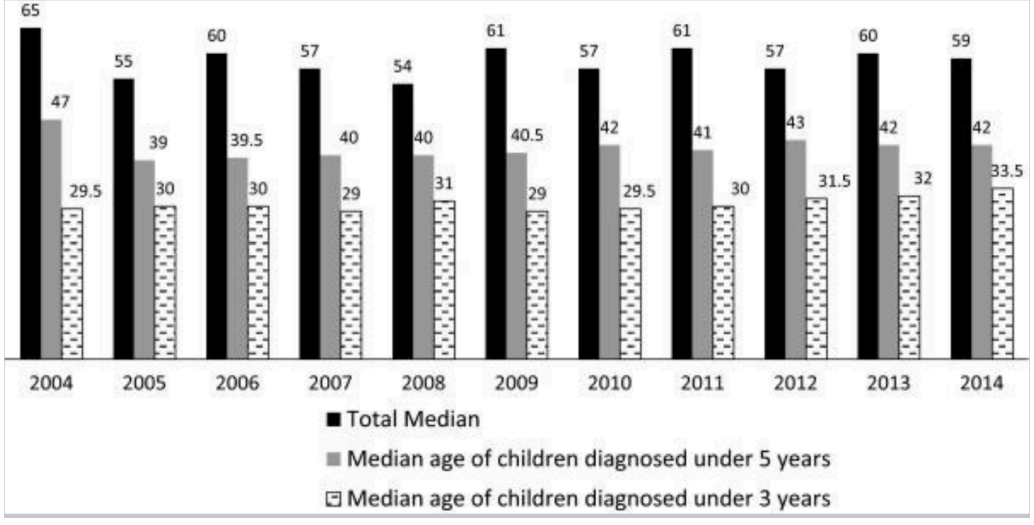
- 9 months

18 months

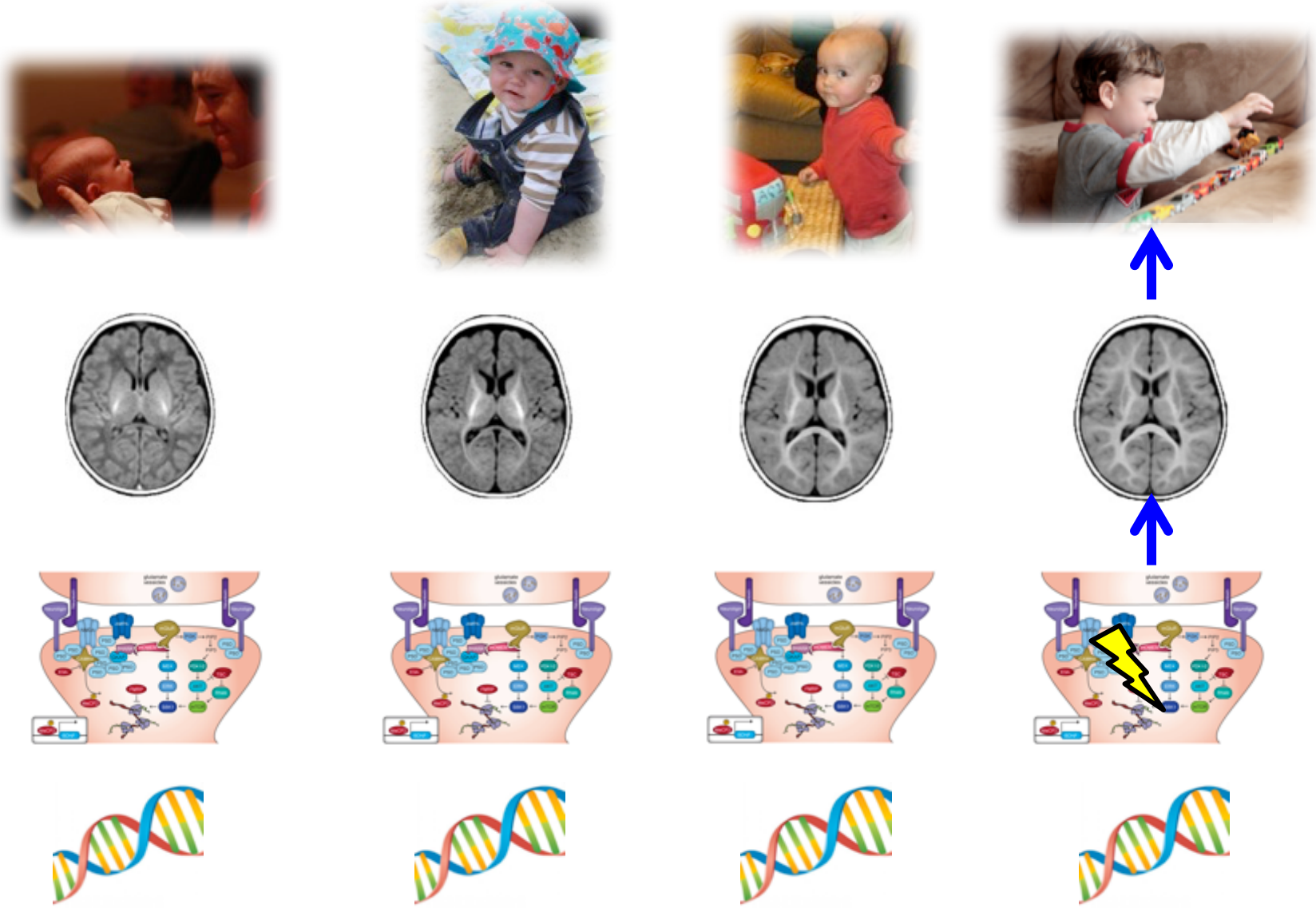
5 years

The University Of Sheffield.

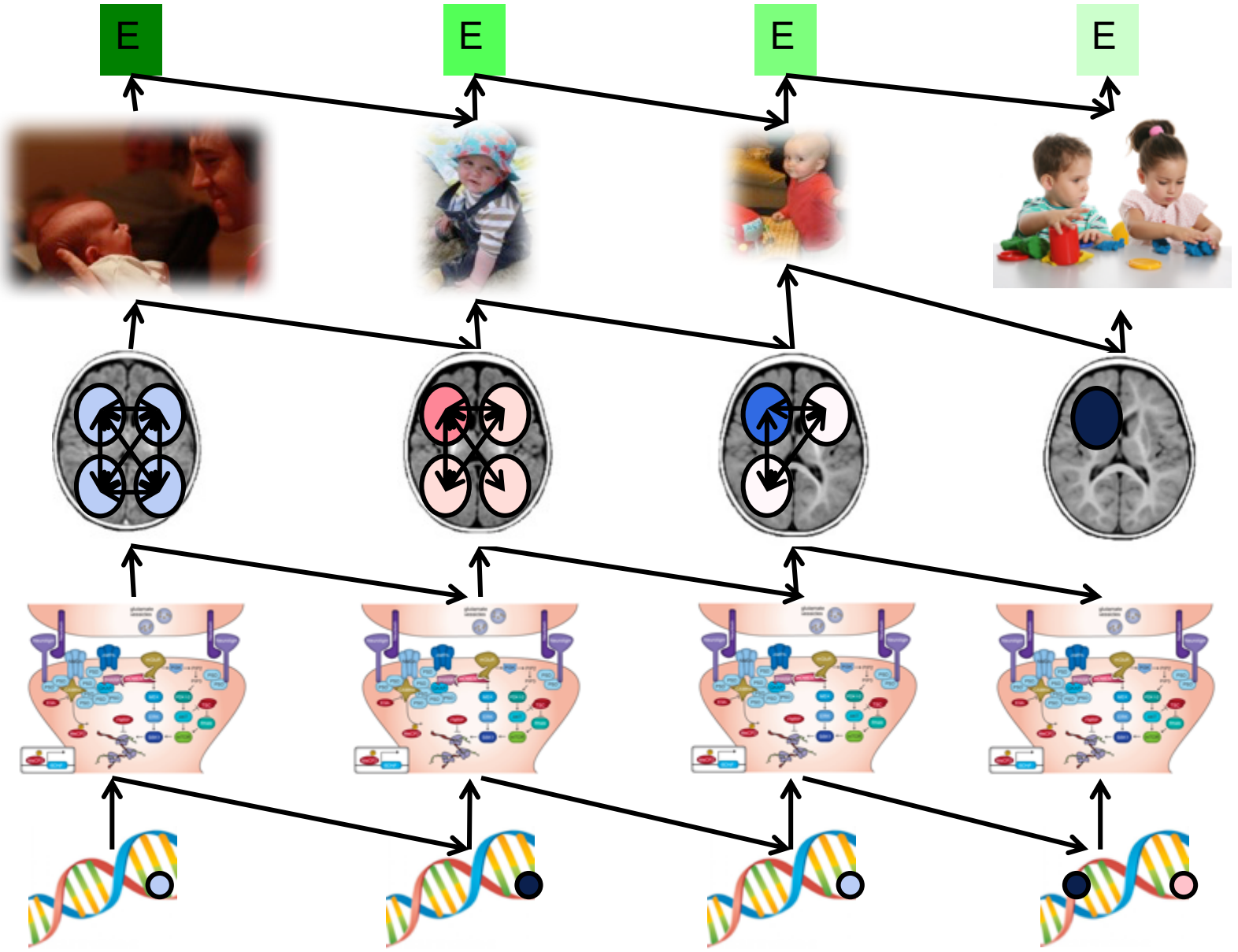
Brett et al., 2016



Development in Translation



Probabilistic specialization



Ozonoff et al., 2011

“Low Likelihood” infants: Older sibling with TD

“High Likelihood” infants: Older sibling with ASD

1% ASD

99% No ASD

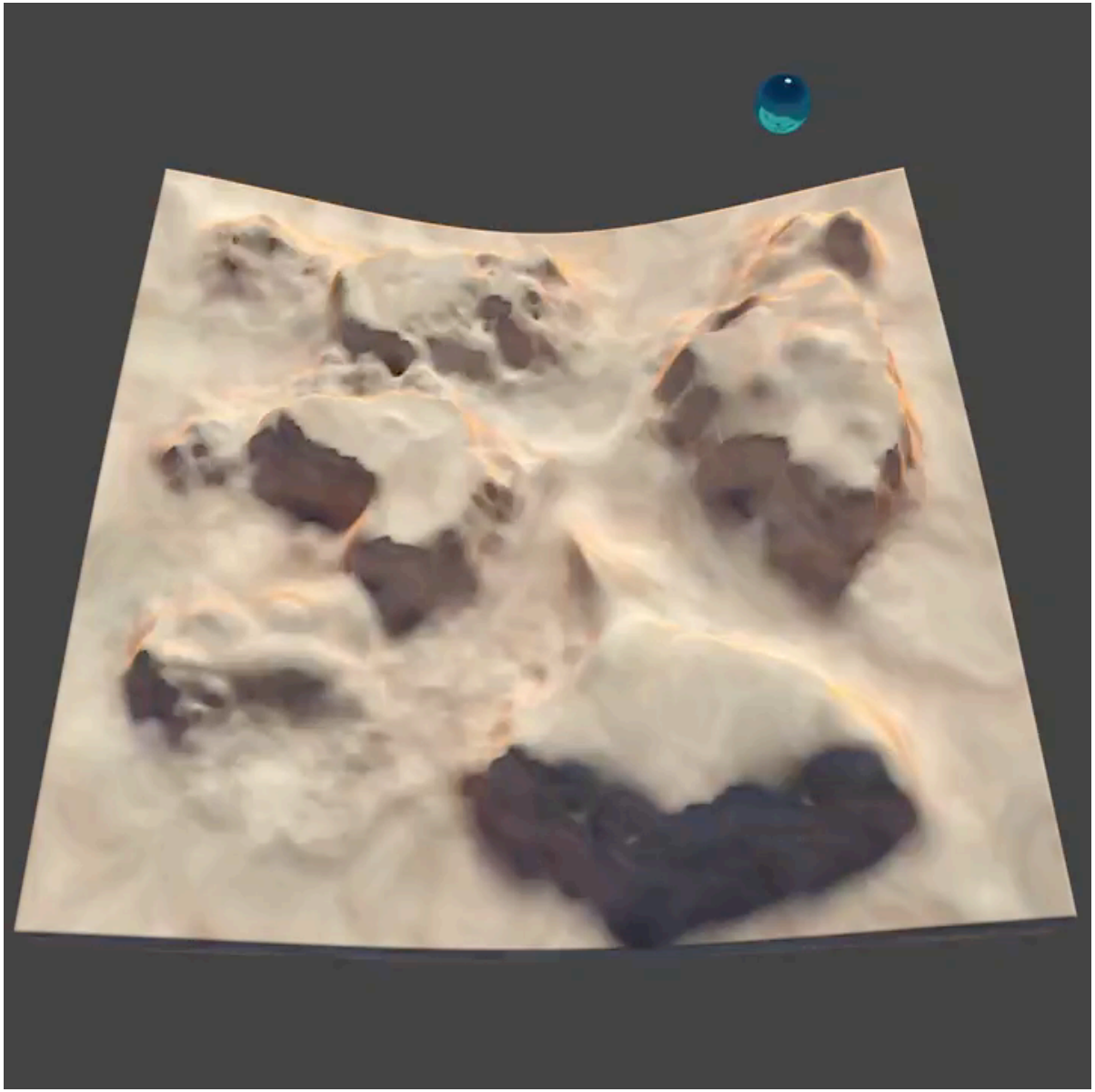
20% ASD

80% No ASD

- 9 months

18 months

2-3 years



Brainview

Why is social engagement important?

RESEARCH ARTICLE | Open Access

Investigating the factors underlying adaptive functioning in autism in the EU-AIMS Longitudinal European Autism Project

Julian Tillmann, Antonia San José Cáceres, Chris H. Chatham, Daisy Crawley, Rosemary Holt, Bethany Oakley, Tobias Banaschewski, Simon Baron-Cohen, Sven Bölte, Jan K. Buitelaar ... See all authors

Regional communication in newborn fMRI

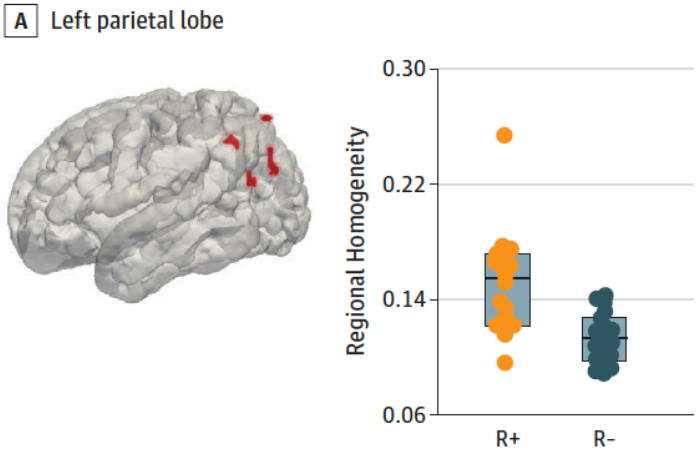
AIMS•2•TRIALS
AUTISM RESEARCH FOR EUROPE

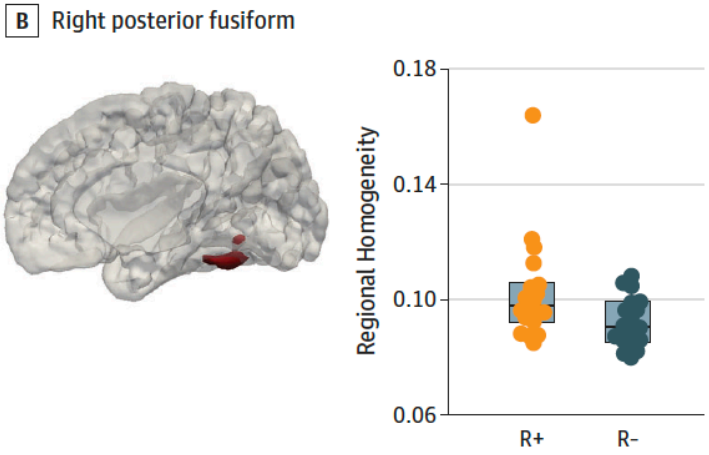
JAMA Network | Open

Original Investigation | Psychiatry

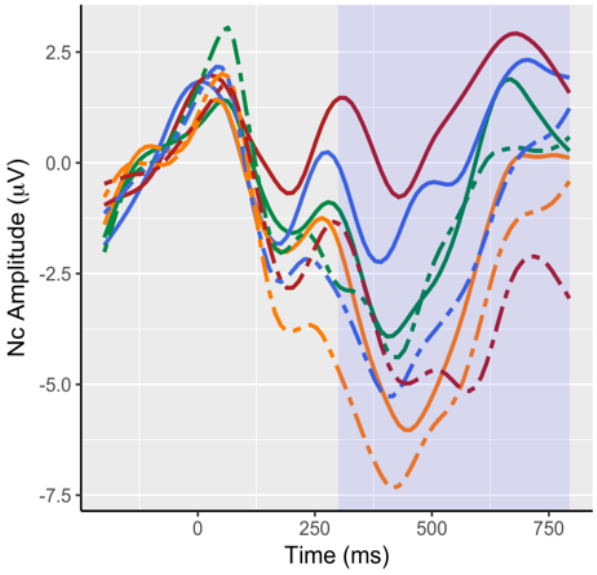
Social Brain Functional Maturation in Newborn Infants With and Without a Family History of Autism Spectrum Disorder

Judit Ciarrusta, MSc; Jonathan O'Muircheartaigh, PhD; Ralica Dimitrova, PhD; Dafnis Batalle, PhD; Lucilio Cordero-Grande, PhD; Anthony Price, PhD; Emer Hughes, PhD; Johannes Klaus Steinweg, MD; Johanna Kangas, BSc; Emily Perry, MSc; Ayesha Javed, MSc; Vladimira Stoencheva, BSc; Ranjit Akolekar, MD, MRCOG; Suresh Victor, FRCPCH, PhD; Joseph Hajnal, PhD; Declan Murphy, MD, FRCPsych; David Edwards, MB, DSc, FMedSci; Tomoki Arichi, MBChB, FRCPCH, PhD; Grainne McAlonan, MA, MBBS, PhD

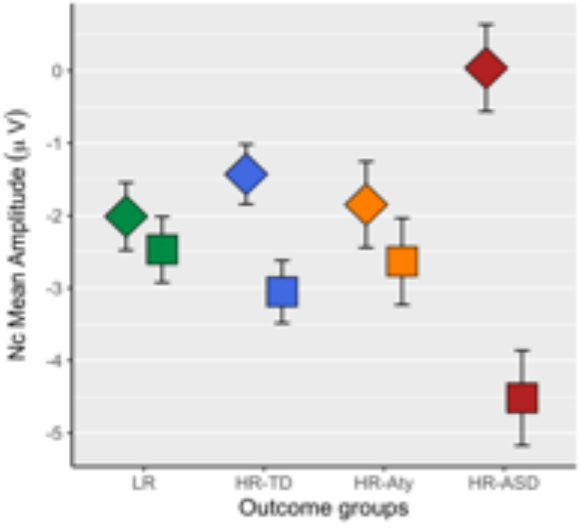




Using scalp topography to measure states of engagement



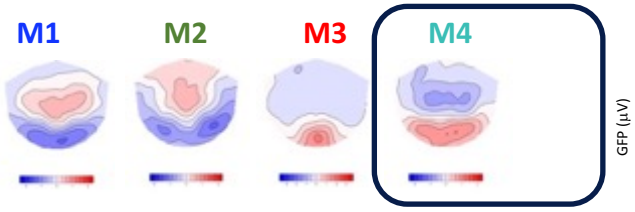
Nc amplitude

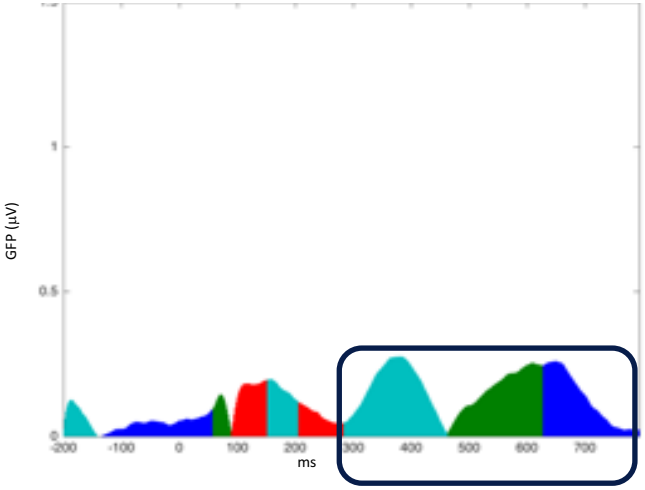


Face Noise

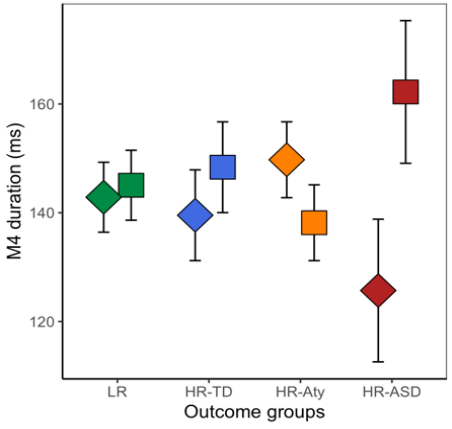
Elsbbagh et al., 2012

EL-ASD
EL- no ASD
EL- Other
LR





Microstate duration

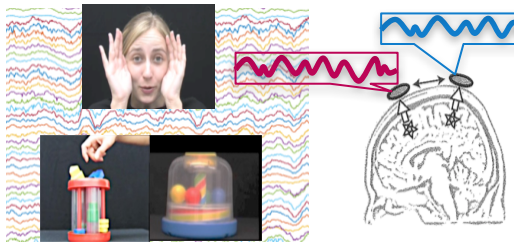


Gui et al., in review

Social engagement modulates network connectivity

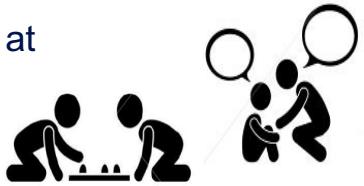
AIMS 2 TRIALS
AUTISM RESEARCH FOR EUROPE

EEG at 14mo



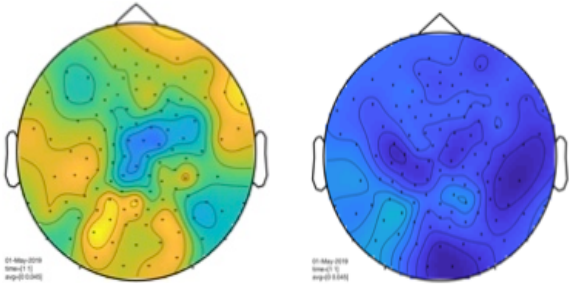
Connectivity for theta band (4-5 Hz)

Communication at 36mo



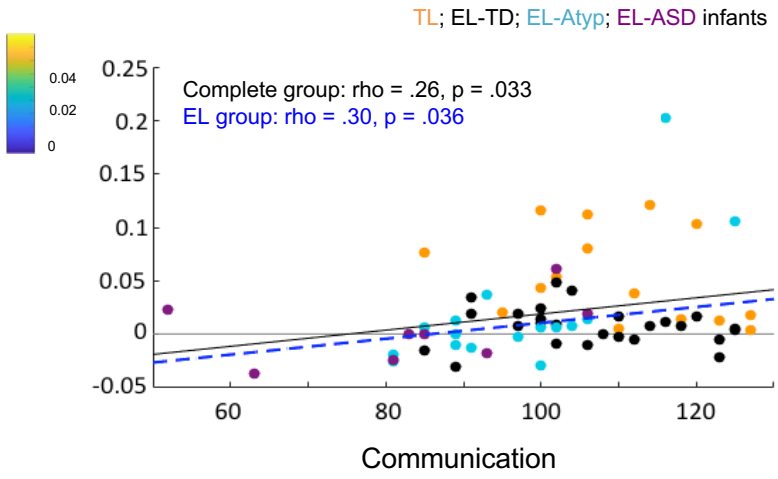
VABS-II

Global dbWPLI (Soc – NSoc)



TL EL

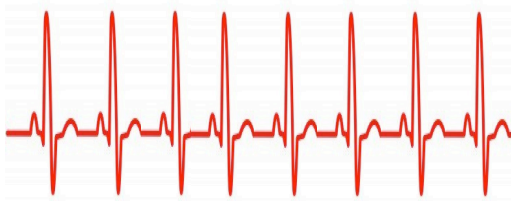
dbWPLI (Soc – NSoc)
For TL connections

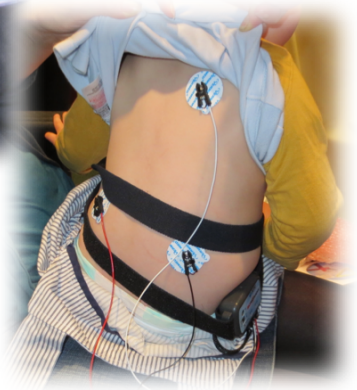


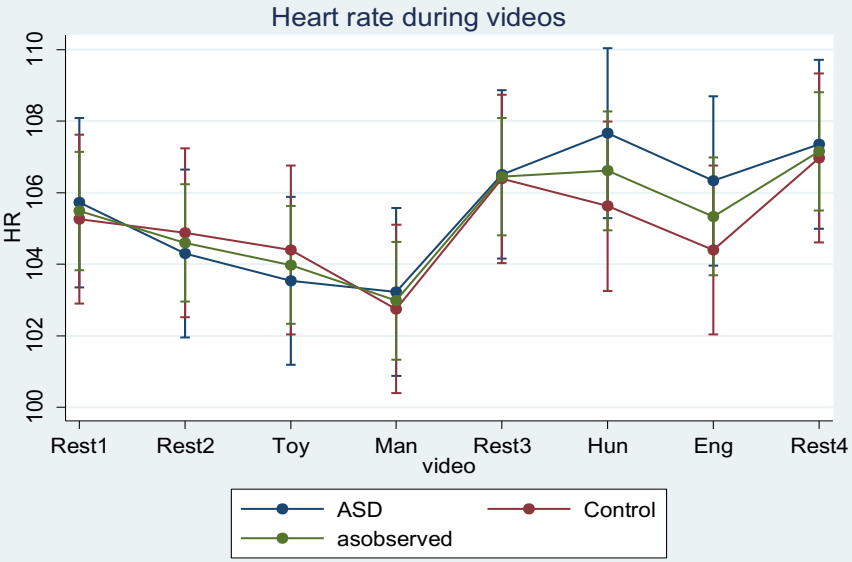
Diminished theta connectivity across neurotypical connections predicts later communication skills

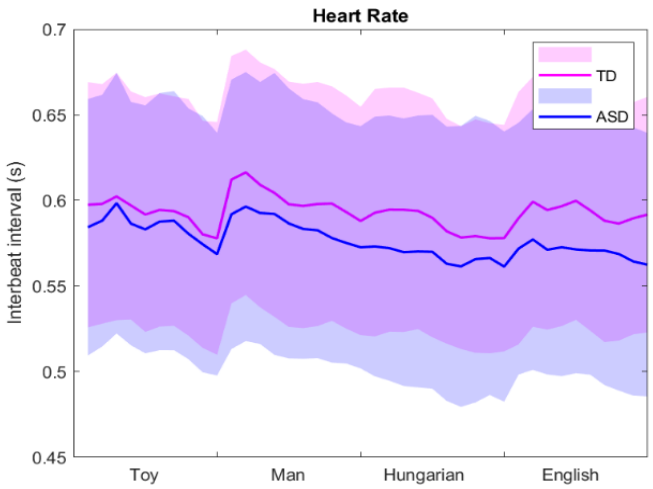
Haartsen et al., in prep.

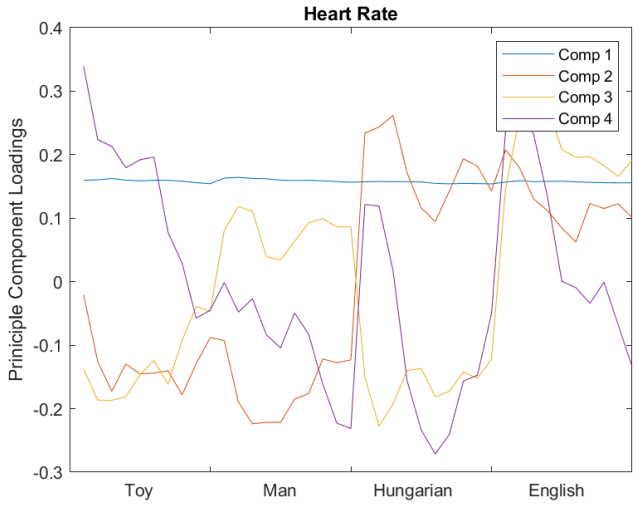
Measuring physiology to uncover social engagement











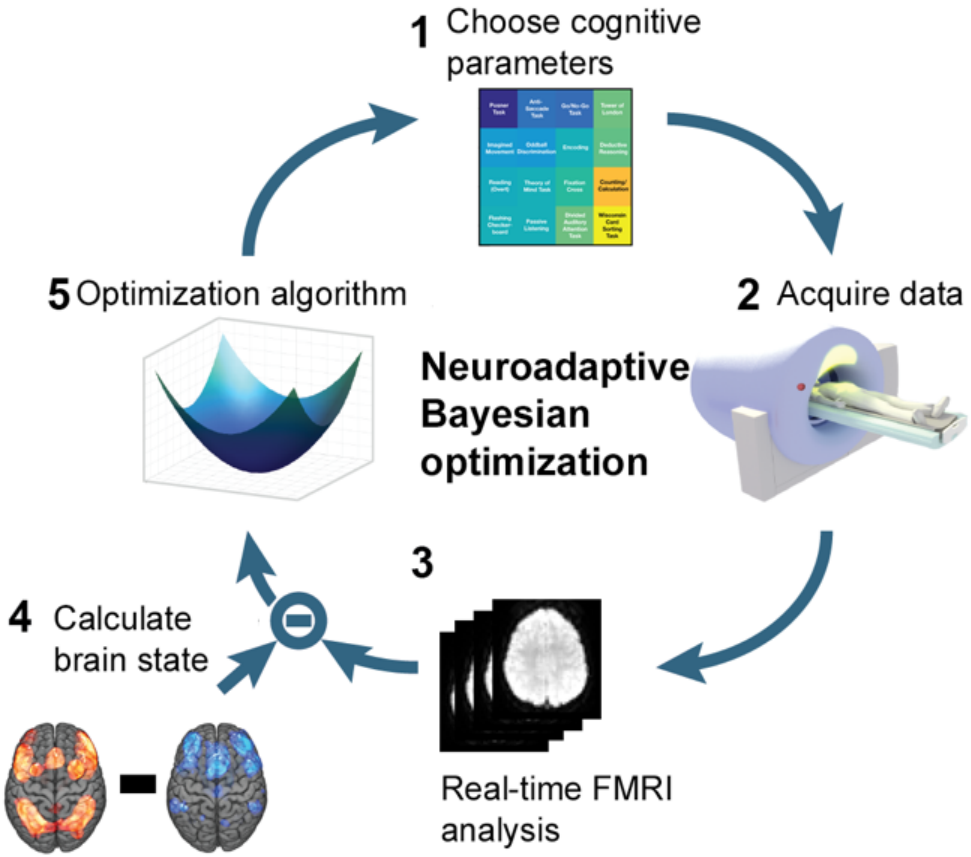
Comp 3 associated with language, social skills, ASD severity; TD group >ASD group

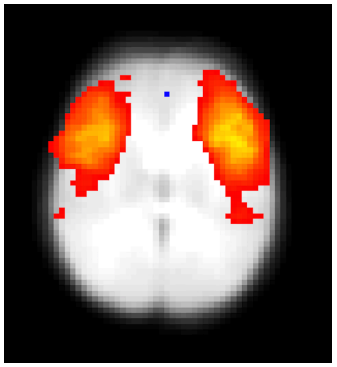
From lab to field

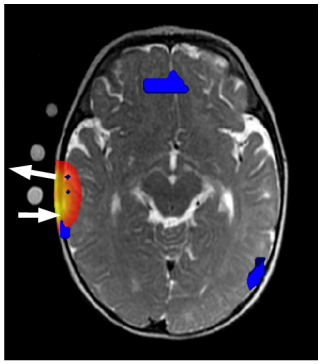
MRC Medical Research Council

Sangath

New paradigms







E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

erc European Research Council

Rob, Fred, Anna, Elena

Ristorante

Thanks!

e.jones@bbk.ac.uk
@EmilyDevNeuro

CBCD Centre for Brain and Cognitive Development

NIH National Institutes of Health
Turning Discovery Into Health

SFARI SIMONS FOUNDATION AUTISM RESEARCH INITIATIVE

For Women in Science
FONDATION L'ORÉAL

AIMS•2•TRIALS
AUTISM RESEARCH FOR EUROPE

autitica
Science in the Service of Autism

MRC Medical Research Council

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

EU-AIMS
Autism Research in Europe

erc European Research Council