The Longitudinal European Autism Project (LEAP)

What is LEAP?

The Longitudinal European Autism Project (LEAP) is currently the largest study in the world to identify variability in autism in terms of behaviour, cognition, co-occurring conditions, outcomes, brain structure/ function and genetics. The study started in 2013, as part of EU-AIMS, a previous project that aimed to identify biomarkers of autism. To capture the diversity of autism, the LEAP study focuses on previously under-represented groups in autism research, including autistic women, girls and individuals with autism and intellectual disability.

Through an improved understanding of the differences between autistic people, this means that instead of taking a one-size-fits-all approach, our research hopes to identify smaller 'subgroups' of autistic individuals with similar characteristics and needs who may benefit most from a particular supportive approach.

Participants

Participants in the study include over 800 families, including approximately 420 autistic people across seven sites across Europe. The age range of participants at the initial phase of the study was 6 - 30 years old. The sex ratio of participants is approximately 1:2 female to male.

SCHEDULES

Schedules are the participant groups based on current age A being adults B adolescents, C children and D adolescents and adults with mild intellectual difficulties (ID).

18 + years old | **12-17 years old** | **6-11 years old** | **12 + years old with mild intellectual difficulties (ID)**

Aims of the study

The study aims to investigate differences in autism in terms of behaviour, cognition, co-occurring conditions, outcomes, brain structure/ function and genetics. The focus of the study is to understand how autism and commonly co-occurring health conditions (e.g. epilepsy, anxiety) develop from childhood to early adulthood, using data collected over two years, with an optional third visit to make comparable results over the years. In addition, to identify features of autism and its co-occurring health conditions that can be measured, called 'biomarkers' and understand individual differences between autistic people.

Who is involved?

The centers involved in the conducting the study include:

- **Institute of Psychiatry, Psychology, and Neuroscience (King's College London)**
- **The Autism Research Centre (University of Cambridge)**
- **The University Medical Centre (Utrecht)**
- **Radboud University Medical Centre (Nijmegen)**
- **Central Institute of Mental Health (Germany)**
- **University Campus Bio-medico (Rome, Italy) ***
- **The Karolinska Institute (Stockholm)* ***

*Data not available at this time
** Data not available for sharing

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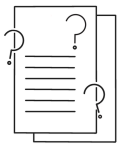
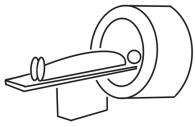
The Study:



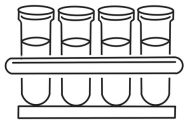
Questionnaires and interviews – We collect information about the development, preferences and experiences of LEAP participants, such as their social activities, routines, sensory experiences and mood. We also ask about family history of different neurodevelopmental and psychiatric conditions.

Cognitive tasks – LEAP participants complete a series of paper-and-pencil and computer tasks that measure processes like attention, memory, sensory and emotion processing or social understanding.



Brain imaging – LEAP volunteers take part in a magnetic resonance imaging (MRI) scan, where information about brain structure and function is collected.

EEG - Record brain activity using an electroencephalogram (EEG), where participants wear a cap on their head (like a swimming cap) with lots of small electrodes that pick up the electrical signals that are sent between different brain cells.



Biological samples – Some participants also provide an optional sample, like saliva or blood during one of their visits. These samples are used to measure immune and hormone activity or provide genetic information related to how the brain develops.

Data Collected

Cognitive /Behavioural

Including:
- IQ
- Executive function
- Sensory processing (visual, auditory, tactile)
- Emotion recognition
- Theory of Mind

MRI

Including:
- Functional (resting)
- Functional (task-based)
- Structural
- Diffusion
- MRS

Eye-tracking

Including:
- Static/dynamic naturalistic scenes
- Attention
- False belief
- Pupillary light reflex
- Biological motion
- Emotion recognition
- Memory
- Change detection

For a full inventory of available measures and sample members, please check the data dictionary.

Biosampling

Including:
- Genetics/ epigenetics
- Inflammatory
- Serotonin
- Gut microbiome,
- Metabolomics/ proteomics

Questionnaire /interview

Including:
- Demographics
- Autistic traits
- Mental health
- Sleep
- Quality of life
- Physical Health
- Adaptive functioning
- Family psychiatric history
- Cognition/Emotion
- Life events

EEG

Including:
- Resting state
- Sensory processing (auditory, tactile)
- Face processing

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