

Developmental Psychology

Developmental psychology is the study of the development of behaviour and cognitive functions from infancy to adulthood. In this specialisation, there is a particular focus on understanding how the development of certain behaviours and cognitive functions relates to a person's biological constitution and to the development of their brain. Students are familiarised with current developmental theories and research findings from different fields and become acquainted with various diagnostic instruments and research tools, such as event-related brain potentials (ERPs).

Students learn about the biological and environmental requirements that are needed to develop functions such as perception, language, (social) cognition, emotion, attention and motor abilities. The programme addresses both typical and atypical development such as in ADHD, Autism, Tourette or Williams Syndrome.

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PSY4950 Introduction in Problem-Based Learning see HSP

Title	Infancy
Period	1
Code	PSY4031
ECTS credits	4
Organisational unit	Cognitive Neuroscience
Coordinator	Hans Stauder
Descriptions	<p>In no other period during our development do our brain and behaviour change so fundamentally and quickly as they do during infancy. This poses particular methodological constraints on the design of experiments and the selection of participants, whose ages are typically expressed in weeks. An additional challenge in infancy research is the limitation posed on communication. Questioning and instructions are of no use in infancy research and so there is reliance on indirect measurement methods like habituation paradigms or brain imaging methods. Nevertheless, many fascinating findings have emerged in recent years concerning often unexpected cognitive capacities of infants.</p> <p>The course commences by addressing specific problems in infancy research and covers the methods used to meet or resolve these problems. Next, biological and behavioural aspects of pre- and postnatal development are discussed, in particular concerning their consequences for later cognitive development. The study of object recognition and object permanence is shown to play a fundamental role in cognitive development during infancy. Individual differences and critical periods are illustrated by a number of developmental disorders. Finally, the early development of social cognition and consciousness is addressed.</p>
Goals	<p>Knowledge of: Biological and psychological development from conception to four years of age, methods and techniques in infant research.</p>
Instruction language	EN
Prerequisites	
Recommended literature	E-reader.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	critical period, object permanence, face processing, joint attention

Title	Perception, Attention and Motor Development
Period	1
Code	PSY4032
ECTS credits	4
Organisational unit	Cognitive Neuroscience
Coordinator	Lisa Jonkman
Descriptions	<p>Although perception, attention and motor function undergo the most spectacular changes during infancy, development proceeds throughout the course of an individual's entire lifespan. In the course, students will become acquainted with the latest theories and experimental findings related to the development of these functions, with an emphasis on biological and neuropsychological models. Knowledge about the way in which brain development is linked to the development of specific cognitive functions is crucial for determining the constraints of development theories. During the course, it will become evident to students that perception, attention and motor development are closely related to each other. Developmental disorders in perception, attention or motor functions can have divergent consequences, depending on the age at which they start. For instance, being born deaf or of becoming deaf at a later age has different consequences due to taking place in different brain development stages. During the course, a number of common childhood disorders associated with aberrant development of perception, attention or motor functions will be discussed. Also here, the focus is on neuropsychological theories on the origins of these developments. Specific topics are the development of 'bottom-up' versus 'top-down' attention processes and the role of eye-movements, the development of executive functions and frontal cortex, the development of perceptual-motor functions, ADHD, Gilles de la Tourette and possible intervention and rehabilitation methods (both pharmacological as well as cognitive).</p>
Goals	<p>Knowledge of: Life-span cognitive development, neurobiological theories on cognitive development, constructivism, maturationalism, visual perception development, eye-movement development, attention development, executive control development, frontal lobe development, motor control development, development of action-perception integration, structural brain development, ADHD, Gilles de la Tourette, fronto-striatal circuits, dopaminergic and noradrenergic hypothesis for ADHD.</p>
Instruction language	EN
Prerequisites	
Recommended literature	<p>Research articles; Book chapters.</p>
Teaching methods	<p>Lecture(s) PBL</p>
Assessment methods	<p>Attendance Written exam</p>
Key words	<p>childhood, adolescence, attention, visual perception, executive control, motor development, ADHD</p>

Title	Practical training: Measuring Attention and Executive Functions in Behavioural Paradigms
Period	1
Code	PSY4033
ECTS credits	2
Organisational unit	Cognitive Neuroscience
Coordinator	Lisa Jonkman
Descriptions	Students will perform several attention and executive function tasks that are frequently applied in clinical and non-clinical developmental settings. Already gathered data from children will be provided to the students so that they can practice with performing statistical analyses. Each student formulates a research question based on the literature. All research questions will focus on themes within the field of childhood development of attention and executive control and associated disorders such as Autism Spectrum Disorder or ADHD. During the course, students will present and discuss their research questions and findings in both group meetings and in a written report.
Goals	Knowledge of: Experimental paradigms to measure attention and executive functions, how to define a valid research question, apply statistics to developmental data and interpret results, write a research paper.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Assignment(s) Paper(s) Presentation(s) Research Skills Training(s) Work in subgroups
Assessment methods	Attendance Final paper
Key words	attention, executive functions, childhood development, experimental psychology, writing

1. *PSY4034 EEG and ERP is equal to RM module PSY4221 EEG and ERP (CN, NE, FN, NP);*
2. *PSY4034 EEG and ERP is offered in the Master CN and DP.*

Title	Practical training: EEG and ERP
Period	1
Code	PSY4034
ECTS credits	2
Organisational unit	Cognitive Neuroscience
Coordinator	Fren Smulders
Descriptions	<p>Electroencephalography (EEG) and Event Related Potentials (ERP) offer a combination of precise measurements for the time course of brain processes. These are low cost, non-invasive measurements and are widely available. For these reasons they make a unique contribution to cognitive neuroscience. Scientific interest in EEG and ERP is growing, and results have been increasingly integrated with other neuro-imaging techniques during the last few decades.</p> <p>Lectures and basic literature provide an introduction for students to the basics of EEG and ERP research, EEG and ERP terminology and the possibilities and limitations of EEG and ERP. For a Midterm paper students study an empirical data article from the literature and answer questions about its EEG and ERP methods and interpretation based on lectures, basic literature and other sources. Students also study practical measurement issues, such as electrode placement and types of artefacts. Finally, students must interpret the resulting data. Successful measurement requires an understanding of the basics of EEG and ERP signal analysis techniques, such as artefact management, spectral analysis, filtering, ERP averaging, time-frequency analysis etc. Students also receive hands-on training in smaller groups in running an ERP experiment, including electrode application, minimising artefacts, and health and safety in the lab. A number of simple experimental paradigms will be used that provide interesting and reliable results. Data processing will include a number of common EEG analyses, e.g. analyses in the time and frequency domain.</p>
Goals	<p>Knowledge of:</p> <p>Basic EEG/ERP paradigms, EEG recording systems, measurement settings, electrode application, data quality verification, analogue-digital conversion, basic EEG / ERP components, interpreting topographical plots, neural origins of EEG, time domain analysis, frequency domain analysis, time-frequency analysis, filtering, ocular artefact control, muscle artefact control, choice of reference, re-referencing.</p>
Instruction language	EN
Prerequisites	none
Recommended literature	<p>Journal articles;</p> <p>Handbooks.</p>
Teaching methods	<p>Lecture(s)</p> <p>Paper(s)</p> <p>Skills</p> <p>Training(s)</p> <p>Work in subgroups</p>
Assessment methods	<p>Attendance</p> <p>Final paper</p>

Key words	electroencephalography (EEG), event-related potentials (ERP), electrophysiology, measurement, analysis of brain potentials
Title	Development of Cognition and Language
Period	2
Code	PSY4035
ECTS credits	4
Organisational unit	Cognitive Neuroscience
Coordinator	Franc Donkers
Descriptions	In this course typical and atypical childhood development of higher order cognitive functions such as memory, language and reading, number processing and arithmetic will be discussed. These higher order cognitive functions are crucial for daily functioning. Two questions will be central in the study of these topics: which changes take place as a child gets older and how do these changes occur? We will approach the how question by studying both neurobiological and environmental factors influencing typical or atypical development. Especially in the case of the development of highly complex skills such as reading and arithmetic many cascaded processes are involved spanning a long period of time. The study of these processes and their basis in the brain is complex and addresses many methodological issues that will be also discussed in the course. Specific topics dealt with are development of working memory, long-term memory, number representation, arithmetic, word learning, reading, and intelligence. Atypical development of these functions, as for instance in dyslexia and dyscalculia will also be studied.
Goals	Knowledge of: Brain structural development and research methods used in developmental research, working memory development, long-term explicit memory development, language development, development of reading and bilingualism, development of number sense and arithmetic, development of general intellectual abilities, dyslexia, dyscalculia
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	cognitive development, brain development, intellectual development, memory, word-learning, bilingualism, number knowledge, arithmetic

Title	Social Emotional Development
Period	2
Code	PSY4036
ECTS credits	4
Organisational unit	Cognitive neuroscience
Coordinator	Tamara Schleepen
Descriptions	Emotions are an essential part of our life. In every generation, humans develop the skills to express subtle emotions and learn to recognize and understand emotions, moods and the thoughts of others. They enter into extremely complex social and emotional interactions with other people. This course will discuss scientific studies about how social emotional life develops. Social emotional development will be studied at four levels. Firstly on the genetic level: students will analyze the role of genes in social emotional development through the study of psychopathologies. Examples include the syndrome of Rett and Williams, autism and psychopathy. Secondly is the level of brain mechanisms (e.g. the role of structures like the amygdala in the development of social cognition). Thirdly is the neuropsychological level: How do cognitive functions (as represented in a theory of mind) and emotional expressions (like blushing) develop and how is their development mediated by brain structures? Lastly, is the level of evolutionary psychology: Why have specific developmental patterns been selected during the course of evolution? Since social emotional development is not only of theoretical interest, the course also deals with practical implications of theories about social emotional development.
Goals	Knowledge of: Theories of development, cause and object of emotion; genetics; laws of Mendel; model of Ledoux; syndrome of Rett and Williams; imitation; mirror neurons; theory of mind, empathy, instrumental helping; altruism; theories of moral development, moral emotions; autism, extreme male brain; temperament; aggression, psychopathy.
Instruction language	EN
Prerequisites	
Recommended literature	Journal articles; Book chapters.
Teaching methods	Lecture(s) PBL
Assessment methods	Attendance Written exam
Key words	theory of mind, empathy, moral development, autism, aggression, psychopathy

Title	Practical training: Psychological Tests
Period	2
Code	PSY4037
ECTS credits	2
Organisational unit	Cognitive Neuroscience
Coordinator	Hans Stauder
Descriptions	This practical training course is concerned with psychological tests which are used to assess cognitive development and functioning of children at various ages. More specifically, students will learn basic skills for administering and interpreting mental capacity tests for children and will increase their reflection on these skills. For example, students can gain experience in administering the WISC and SON tests and in interpreting child behaviour using the Bayley Scales of Infant Development (Bayley-III-NL).
Goals	Knowledge of: Administering and interpreting mental capacity tests.
Instruction language	EN
Prerequisites	
Recommended literature	User's guides of the mental capacity tests; Selected papers.
Teaching methods	Assignment(s) Lecture(s) Paper(s) Skills
Assessment methods	Attendance Final paper
Key words	cognitive capacity tests, IQ tests, WISC, SON, Bayley-III

PSY4098 Academic Skills & Research Proposal see HSP