Preface

Welcome to the 2014 edition of the Annual Report of the Leiden Institute for Brain and Cognition (LIBC). In 2014 the board and the management team of the LIBC developed a new management structure for the institute that will be implemented in 2015. The management team and the board will merge into a single layer, making the decision processes shorter and more efficient. To be continued! Under the guidance of the new coordinator Onno Meijer, the program of the minor Brain & Cognition organized by LIBC is being updated. The new program will better reflect the interdisciplinary connections in research that we value so much at the LIBC. You can read more about the minor program in this report.

The public symposium, “Optimaliseer je hersenen” organized by Andrea Evers and Lorenza Colzato, was a big success, with a full Stadsgehoorzaal. Hotspot nr. 6, “LIBC-Social” was launched, which focuses on humans as a social species. This hotspot will organize the next public symposium, called “Mensen kijken”, on November 6, 2015. Save the date!

Fourteen grants from different organizations were obtained, among others a €2,000,000 ERC grant to Andrea Evers, and a NWO Vidi grant to Lenneke Alink. Finally, the institute – and especially fMRI-research coordinator Mischa de Rover, about whom you can read more in this report – was very happy to obtain extra technical support for fMRI research.

We hope you will enjoy reading this report. For more information on the LIBC and affiliated labs, please visit www.libc-leiden.nl.

The LIBC Management Team, April 2015
Scanning humans is complicated? Think again! What fMRI of zebra finches can teach us about the sensitive period of language development

Anne van der Kant (LUCL) recently defended her dissertation for which she performed comparative research on the neural basis of learning vocalizations in songbirds and humans. Her project was carried out in both Leiden and in Antwerp.

Both humans and songbirds like the zebra finch have a sensitive period for acquiring vocalizations; once that period has passed, a person or a songbird will have considerable problems with learning a language or a song. Anne was particularly interested in the neural underpinnings of this sensitive period.

Anne performed two studies with zebra finches, small songbirds. She had zebra finches learn a specific song from a tutor bird – a surrogate father. Once the birds have learned a song, they are able to produce it from memory, suggesting that the song is represented in the birds’ brains. “We were interested to study the nature of these representations: how are these songs represented?” To answer this question, Anne had her birds listen to recordings of the songs they had learned, sung by themselves, their tutor-bird, or another bird while they were placed in an mri scanner.

Any researcher who thinks that scanning human participants can be challenging, is encouraged to try scanning zebra finches one day. “The Bio Imaging Lab where I worked in Antwerp had a very powerful 9.4T animal scanner, but I used their—still very powerful—7T mri scanner,” Anne recounts. Because zebra finches have such a small brain, a powerful scanner was necessary to guarantee adequate spatial resolution: “Our field of view was just 1.6 cm.”

The procedure to scan birds was elaborate. Zebra finches are smaller than a sparrow, and they are quite fickle. “I initially worked in a large open space with heater tubes running along the ceiling. If I wouldn’t hold a small finch very well, it could fly off and would sit on one of those tubes – and I had to go and chase it with a butterfly net.” Assuming that a bird did not accidentally fly off, it would be anesthetized with gas and then affixed to a mask that administered more gas. “Of course, animal welfare was closely monitored,” Anne explains. During the experiment, a finch’s body temperature and respiration were monitored carefully.

When a zebra finch was anesthetized, it would be put on its belly, beak forward, with the mri coil on the back of its head, in a plastic tube. The bird-in-a-tube was then slid into the scanner bore. “Clearly, the scanner bore was a lot smaller than that of human scanners,” Anne elaborates, “it was only 20 centimeters in diameter.” The scanner itself...
was quite large though, at over two meters high.

The birdsong stimuli were presented through the little loudspeakers that can be found in headphones (but with the magnets removed to make them scanner-compatible). These loudspeakers were put right next to the birds’ ears. Although the finches were asleep, their auditory system responded to the stimuli. “We found that the birdsong from the tutor-bird activated an area on the right side of the finches’ auditory midbrain. In a follow-up study with younger zebra finches, Anne found that a lot changes in the brains of developing zebra finches. “As the end of the sensitive period approaches, songs from their tutor-bird activate mainly the left side of the finches’ auditory midbrain; when their sensitive period has ended, we mainly see activity in the right side of the finches’ auditory midbrain.”

Following zebra finches in Antwerp, Anne moved on to study humans at the Faculty of Humanities in Leiden, and she also collaborated with the lab of Eveline Crone at Developmental Psychology in Leiden. She performed two studies with humans. In the first of these, she had adults learn an artificial grammar. Her earlier study with zebra finches had suggested that brain activity in the auditory cortex scales with learning performance: birds who showed more brain activation while listening to birdsong of their tutor-bird also learned that birdsong better. Anne found a comparable result in humans: more brain activity in specific areas was correlated with better learning of an artificial grammar. “Of course, it’s always complicated to compare humans and animals. Language is particularly complex,” Anne explains, “because in songbirds we can compare one song with another – but in humans, we cannot compare just one word with another word: that would grossly underestimate the intricacies of language.” This means that in humans, she found activation in more brain areas than she did in songbirds.

“A particularly interesting question is whether children who are still in their sensitive period use different brain areas than adults when learning an artificial grammar, which is what we found in zebra finches,” Anne explains. “In collaboration with Sandy Overgaauw, I have acquired data from children for my dissertation, but it is not analyzed yet. I can’t wait to see whether we have been able to replicate our bird results in humans.”

Renske Huffmeijer received a Marie Curie Intra-European Fellowship grant for the research project *Frontal asymmetry as an endophenotypic marker for differential susceptibility to parenting in infancy: a functional NIRS study*. For this project, Renske will spend a year at Paris Descartes University (France) collaborating with Judit Gervain.
How teaching an interdisciplinary minor is like writing a good children’s book

The LIBC does not just value research; it values the teaching of the knowledge that is acquired by research to students. In the Brain and Cognition minor, third-year Bachelor students are acquainted with a number of (neuro)cognitive scientific fields. Minor coordinator and LIBC member Onno Meijer (Endocrinology, LUMC) elaborates.

“The Brain and Cognition minor is a unique interfaculty programme that is very popular among students: we admit around 60 students every year, but there is actually a waiting list of about 40 students who would like to enroll,” explains Onno. Every year, about 100 students from Biomedical Science, Biopharmaceutical Science, Medicine, Psychology, Linguistics, and Biology intend to enroll in the interdisciplinary Brain and Cognition minor programme.

In this programme, students first receive an introduction to either the neurosciences or to psycholinguistics, based on their academic background. When all students have acquired the necessary knowledge to understand cognitive neuroscientific terms, they participate in five courses that cover the broad scope of the cognitive neurosciences: Animal Cognition, Neural Underpinnings of Cognition, Brain diseases, Pharmacology of Cognition, and Psycho- and Neurolinguistics. All of these courses are taught by LIBC members who are experts in their respective fields.

The minor is crowned with a research project in which students engage in literature study or practical work, either individually or in small groups. This project allows them to become more acquainted with either a specific topic or a research technique, under the supervision of LIBC members. “The Biomedical and Medicine students are exempted from this research project, because their study programmes do not allow for such a project,” comments Onno.

Catering to students from such diverse academic backgrounds seems to be an interesting challenge. “Most certainly,” says Onno, “and the challenges faced range from highly practical to profoundly theoretical.” For example, the Faculty of Social Sciences observes the so-called ‘academic fifteen minutes’: every lecture starts fifteen minutes after the official starting time; such a tradition is not upheld in the Faculty of Medicine. This initially led to confusion among students.

A more profound challenge lies at a theoretical level. One obvious issue is the diverse academic background of the participating students: for some, this minor is the first time they learn about neurons, while others are used to studying the brain at the level of genetic transcription factors. How does one introduce and discuss topics so that they are clear to all students? “It’s like writing a children’s book,” Onno explains, “A good children’s book has several layers:

Lenneke Alink has been awarded a VIDI grant (€800,000) by NWO for her research project Changing chaos: the causal role of household chaos in child maltreatment. The grant will allow her to study the question whether chaotic circumstances can cause child maltreatment.
the youngest children will miss the more complicated layers, and some layers are so complicated that only parents will understand them.” “In fact, I think that also students from a discipline like Law should come to our minor”

Onno gives another example, “In my research, I study the effects of cortisol on memory. I teach all students in the minor what happens with our memory when you administer a cortisol pill. The students from Biomedical Science are typically more familiar with such studies than students from the social sciences or humanities are. Therefore, I give the Biomedical students an extra assignment during the lecture: I ask them how they would measure which specific proteins are involved in such processes.” In this manner, the lecturers in the minor can tailor their teaching to the diverse academic backgrounds of their students.

“That’s definitely a challenge,” comments Onno, “but that also makes this minor so interesting. Every lecturer brings his own expertise to the minor, every lecturer teaches from his or her perspective. I think that’s part of the charm of this programme, that we work with all the expertise that we can get. In that respect experiencing the diversity in itself makes it worthwhile. All the same, we have to aim for integration between subjects, to make the whole more than the sum of its parts,”

For some students, the minor programme is a true eye opener; not only because it offers fascinating new perspectives (like the cognition involved in birdsong) and unique practical sessions (like a brain dissection), it also helps students attain a better understanding of their personal academic interests. “I vividly recall the psychology student who participated in the Brain and Cognition minor and who became so captivated by the ‘hardcore’ neurosciences that he moved on to do a master in the neurosciences in Amsterdam. In his case, the minor guided him to a radically different field of study than he would have pursued otherwise. In that manner, this minor can evoke a strong homecoming feeling in students: they suddenly realize that this is what they want to study.”

A multidisciplinary minor requires efficient coordination. “We have been very fortunate with Maarten Bergwerff, who was instrumental in the development of this minor, and who solved many logistic problems, such as communication with four different student administration centres.” Maarten was succeeded by Tiny Luttels, whose untimely and unexpected death shocked her colleagues. “Not only did Tiny do excellent coordination work for the minor, but she was characterized by great empathy, both towards her colleagues and the students. Her passing is a great loss for the minor Brain and Cognition."

Naomi Ellemers is elected to be a Corresponding Fellow to the British Academy for the Humanities and the Social Sciences, because of her eminence in research and publications and their high international standing. This prestigious organization is composed of distinguished scholars and its goal is to “inspire, recognize and support, excellence in the humanities and the social sciences.”
From ensuring safe operation of the scanner to analyzing data acquired with it: The many responsibilities of the LIBC support team

The LIBC has advanced research facilities like 3T and 7T MRI scanners, however, not everyone realizes that there is a support team to ensure proper, safe, and smooth functioning of this equipment. Mischa de Rover (LIBC, Clinical Psychology) is charged with organizing the logistics associated with the 3T scanner.

“There’s a team of people operating behind the scenes of the scanner, led by LIBC director Serge Rombouts” explains Mischa. First of all, there is Wouter Teeuwisse who is in charge of MRI safety. Considering the 3T scanner has a magnetic field that equals 60,000 times the strength of the earth’s magnetic field, it is clear that correct safety measures need to be observed at all times when operating it. Wouter does more than just teach and ensure safe operation of the scanner: he also tests researchers to ascertain whether they can obtain a scanning license to use the scanner unsupervised (but always with a scan buddy – once again to ensure safety). Furthermore, Wouter serves as an intermediate between researchers and the technical unit of the Radiology department in the event of acute technical problems.

“LIBC researchers are also supported by two laboratory technicians [laboranten],” continues Mischa. Gijs Vermeij and Christal van de Steeg-Henzen are very experienced 3T users who are tasked with quality control to ensure proper and consistent functioning of the scanner, supervised by Paul de Bruin (Medical Physicist). They also write standard operating procedures, for example to make sure that researchers know what to do in case of emergencies. Gijs and Christal also provide safety training for researchers who want to use the scanner. Being well-versed in scanner safety protocols, the lab techs also supervise the person who cleans the scanner room. “The scanner is basically a giant magnet, so we have a specially trained cleaner with specialized, non-ferrous equipment,” explains Mischa. The lab techs’ contracts have recently been extended to give them more time to help out LIBC researchers in various ways, such as by giving them tips on how to optimize their scanning procedures. “I’m very pleased we were able to extend the availability of Gijs and Christal, so that they can share their expertise with the LIBC researchers – and judging by the positive feedback I have received, so are the researchers”, says Mischa.

“I am mainly involved in organizing,” says Mischa. She supervises the two LIBC assistants who are tasked with entering participants in the EZIS registration system and planning participants and safety trainings, as well as the lab techs. Furthermore, she makes an index of the needs of the various scanner stockholders to see how much scan time all the LIBC researchers need, then distributes the scan time in blocks. Mischa is actively involved in the fMRI

July 29 & August 4

Bart Verkuil and Marieke Jepma both received a VENI grant from NWO (€250,000). Verkuil received the grant to study the involvement of the parasympathetic vagal nerve in people who worry chronically. He will use an interesting technique that allows him to stimulate the vagal nerve externally by applying a painless electric current to the outer ear. Jepma received the grant to realize her cognitive psychology project Neural mechanisms of pain avoidance and learning in healthy and chronic-pain populations.
data-analysis course of the LIBC; she teaches all practical sessions within the course. “This year, the course offers a very exciting new opportunity for students to actually acquire fMRI data themselves during the course, so that they can analyze data they have personally collected,” explains Mischa excitedly. Mischa also supports new researchers: she advises regarding the feasibility of new research projects, and she provides guidance on optimizing task design for use in the scanner. She also supports data analysis, currently mainly in task and resting state fMRI.

“I am supporting several projects right now,” Mischa says. One of these projects involves arterial spin labeling (ASL), a technique that measures perfusion in the brain and that Mischa helped to implement. Bernadet Klaassens studies the effects of acute administration of antidepressants on the perfusion signal. “ASL is a very exciting technique,” elaborates Mischa, “because it is currently the only non-invasive MRI technique that is quantifiable: it really allows us to assess how many milliliters of liquid flows through a given voxel. This makes it a whole different ballgame from the more commonly used and relative measure of blood-oxygenation level dependent (BOLD) signal. When using a signal to for instance classify diseases, such a non-relative quantifiable measure is better than a relative measure that is different for every person.”

Mischa does not just support the data-analysis stage of research projects. She has been involved in the setup, data acquisition, and analysis of a project from Clinical Psychology, performed by Ellen de Bruijn and Margit Ruissen that focuses on social influences on error monitoring. In addition, Mischa supports other projects, including experiments on pain perception (supervised by Albert Dahan, Anesthesiology) and learning grammar (Olga Kepinska, Linguistics).

“Don’t forget to mention Mattanja Latuhihin-van der Wielen and Soraya Arthur-Kovacs,” Mischa adds, “they are the two management assistants of the LIBC, and their excellent work is often overlooked!”

The LIBC (Andrea Evers, Lorenza Colzato, Mattanja Latuhihin-Van der Wielen) organises the public symposium Human Potential: Optimaliseer jezelf, Train je hersenen (Human Potential: Optimize yourself, train your brain) in the Stadsgehoorzaal. Various speakers give talks on maximizing our human potential, and the topics of their presentations range from healthy aging, to addiction, to creativity.
The difference between predictions and predictors: Using ensemble methods to improve the utility of regression models

Mark de Rooij (Methodology and Statistics in Psychology) has been at Leiden University for most of his career: he defended his dissertation in 2001 and became a full professor in 2014.

In his dissertation, Mark focused on statistical models for categorical data – he studied longitudinal data to see how people move from one category to another, how one can compute the probabilities of that happening, and how individual differences can be modeled.

As time progressed, Mark started to focus less on longitudinal data and more on logistic regression, a statistical technique that quantifies the relationship between a categorical dependent variable and a (number of) independent variable(s), referred to as predictor variables. Mark slowly started to emphasize machine learning algorithms in this research: algorithms that can learn from data. “Machine learning is all about making predictions,” Mark explains, “While traditional statistics and psychometrics is about explaining data, I am interested in how the difference between explaining and prediction are manifested in psychology.”

Mark focuses on complicated data in which there are more predictor variables than participants, as is the case in fMRI, for example. Mark studies how to construct models in such scenarios and how to select the most optimal model. In these situations, traditional p-levels become inadequate, so Mark uses so-called cross-validation, a technique that estimates the performance of a predictive model, that is, it quantifies how well the model will generalize to independent data sets.

Mark collaborates closely with Serge Rombouts (Psychological Methodology and Statistics and Radiology). Serge’s VICI project is focused on finding early predictors of Alzheimer’s disease. “In other words, we want to be able to make a classification based on brain scans. We use neural phenomena as predictors to try to ascertain, in as early a stage as possible, who will develop Alzheimer’s disease, and who will not.” The challenge lies in finding good, accurate predictors that work so well that as many people as possible can be diagnosed early on in their disease, while avoiding false positives. In other words, avoiding the error of classifying people as being at risk for developing Alzheimer’s disease when, in fact, they are not.

To find these predictors, Serge’s PhD students Frank de Vos and Tijn Schouten are acquiring structural and functional MRI data as well as diffusion tensor imaging data (that charts white matter tracts in the brain) of Alzheimer’s patients.

Barbara Braams is featured in the Royal Netherlands Academy of Arts and Sciences’ Faces of Science series. In this series of blogs and videos, talented PhD candidates explain their research in terms that high school students can understand. Barbara recorded a video about adolescents’ sensitivity to reward.
“What we want to know is how the classification of Alzheimer’s disease versus good health can be related to the brain: that is logistic regression, too.” Alzheimer’s disease damages the brain. The goal of this collaborative effort is to find predictors that can be used to diagnose the disease before brain damage occurs.

The trick, as with all regression analyses, lies in finding the right predictors. In logistic regression for complex data, people typically penalize regression weights (i.e. the values that indicate how much a predictor variable contributes to the regression model), so that all the regression weights become smaller and many become zero, suggesting that those predictors are not so relevant to the model. Mark uses cross-validation techniques to set these penalties. Cross validation is traditionally performed on small chunks of data. It is crucial to find a model that fits the data well: if a model is over-fit, it cannot be generalized well to other chunks of the same data set (or even to other data sets), but if it is under-fit, the model yields too few useful predictors.

“We now use so-called ensemble methods,” Mark says. These methods allow him to fit models for several chunks of data, referred to as domains. This technique can improve the predictive abilities of the regression models because different domains of the data can be modeled by different techniques.

These ensemble methods can be related to the phenomenon of wisdom of the crowds that is well-known in psychology. “Once upon a time, people had to guess the weight of an ox on a spit. I believe it was Galton who took the average of all the estimates – turns out this average was very close to the actual weight of the ox.” One condition for this to work is that the members are independent: they must not be influenced by each other.

“In the case of the Alzheimer’s predictors, we implement this principle by fitting different models to different chunks of data: fMRI, structural MRI, and DTI. We even fit models to different chunks of data within those bigger chunks.”

Mark gives some final advice. “Do not confuse predictors and prediction and do not confuse the best predictor with a good prediction. Many psychologists do that – they run a regression and find a good model fit. They then state they can predict their dependent variable from a number of independent variables. I disagree; one does not predict one variable through the other, but one can explain one variable through the other. Your model explains data but it cannot necessarily predict the data of new participants. If researchers were more attentive to the difference between explaining and predicting data, I believe the gap between psychological science and psychological practice could be reduced significantly.”

Roberta Sellaro and Claudia Pama win the Popularisatieprijs (‘Popularization Prize’) of the Dutch Society for Psychonomics. Roberta and Claudia use transcranial direct current stimulation to modulate implicit bias towards social discrimination.
From babies’ looking times to spectrograms: Studying the acquisition of language

In 2014, Claartje Levelt (Linguistics) became a full professor. Although she is trained in theoretical linguistics, she studies how babies acquire a first language from both linguistic and psycholinguistic perspectives.

“I study the acquisition of phonology – that is, the sound structure of a language,” explains Claartje. She has followed the language development of children from their first to their second and a half year of age for her PhD. The longitudinal data that she collected is stored in a large, publically accessible database, called Childes/Phon. “I still study the data in that database, from different perspectives.” Claartje studies word productions, and the developing word production mechanism. “I use the speech production model by Pim Levelt,” Claartje pauses and smiles, “Levelt Sr.; this model consists of various modules. It is not clear yet how the speech production mechanism develops in young children. What causes the deviating word productions of young children? Every module in the model has to be considered.” It can be complicated to disentangle all the possible causes for such phenomena. For example, one possibility would be that a word has not been stored correctly in the mental lexicon. This hypothesis can be tested in a perception experiment.

Claartje has a babylab that she uses for experimental research. One paradigm that is used a lot involves looking times: young children are presented with two pictures of objects, for example, a ball and a flower. Then, one of these objects is named: “Where is the flower?” In principle, children will always look at the object that is named, but here is the trick: if you name an object incorrectly (“where is the flower?”) and children notice the difference between correct flower and incorrect fower, their looking times for the two trials will differ.

Claartje uses other methods in addition to these experimental methods. “We use spectrograms, visual representations of the spectrum of frequencies in sound.” Spectograms are used for acoustic analysis: they allow her to see things that we cannot hear. If a baby utters a word, it may seem like a specific sound is omitted from his or her production – like fower, instead of flower – but it may yet partially show up in the spectrogram. “That suggests that the child has stored this ‘missing’ sound in the mental lexicon, but it is not fully encoded phonetically,” Claartje elaborates.

That sounds can be stored correctly even though they seem to be missing from the production can also become clear in a production experiment, where two-year-olds are encouraged to name pictures. Some of the pictured words are difficult because they start with two consonants, a cluster (like in flower), and the child will almost always produce only one. As soon as a child mispronounces such a word (fower), the experimenter gives a subtle cue to point out the...
mistake, for example, by saying “Huh?” Even these young children react to this prompt by repeating the incorrectly pronounced word, and often interesting changes occur. Sometimes the other member of the cluster is produced (i.e. turning flower into lower), or the word is even produced correctly (flower!). “This shows their self-monitoring abilities, and also that a mispronounced word is often represented correctly, while the planning or execution of a motor plan can be problematic.”

“I really enjoy the interdisciplinary collaboration possibilities that are offered by the LIBC,” Claartje says enthusiastically. In 2007 she started to collaborate with LIBC member Carel ten Cate (Biology), on a first comparative baby-zebra finch PhD project, funded by LIBC. In 2012 she was awarded a NWO Vrije Competitie grant for a collaborative project with Carel ten Cate and Jelle Zuidema (ILLC, UvA). Together, they study the learning mechanisms that are necessary to acquire a language. “The question is to what extent these learning mechanisms may be shared with other, non-human species. Therefore, in this project, we compare the rule learning abilities of human infants and zebra finches.” To do so, similar Artificial Language Learning experiments are run on infants and zebra finches, and a model of rule learning is built that takes into account the different factors that affect learning.

Claartje also collaborates with Szilia Biro (Child Studies) and Stephan Huijregts (Clinical Child and Adolescent Studies), two other LIBC members. “We first obtained an LIBC starting grant and then a LUF-Gratama grant to engage in an exciting project on the effects of prenatal exposure to tobacco on brain development in infants.” The LIBC grant money was spent on near-infrared spectroscopy (NIRS) equipment that allows the researchers to do non-invasive functional neuro-imaging.

“There is much more to discover,” says Claartje, “ and I would love to collaborate with other LIBC members in the future.”
Facts and figures 2014

INTRODUCTION

The Leiden Institute for Brain and Cognition (LIBC) started on January 1, 2006, as an interfaculty centre for interdisciplinary research on brain and cognition, as a result of a collaboration between the Leiden University Medical Center (LUMC) and the Faculties of Humanities (FH), Science (FS), and Social and Behavioural Sciences (FSS) of Leiden University. Since 2009 the LIBC is part of the university research profile area “Brain Function and Dysfunction over the Lifespan”.

Particularly strong, profile-building interdisciplinary research areas within the LIBC are captured by a set of ‘hotspots’. Since 2009, each year a new hotspot is officially launched. This is accompanied by a public symposium and other (e.g., educational) activities with the aim of informing the broader public about related issues, and to further foster and facilitate research on this topic.

Current and future hotspots are:
- LIBC-Junior (launched in 2009)
- LIBC-Language (launched in 2011)
- LIBC-Pharma (launched in 2012)
- LIBC-Stress (launched in 2013)
- LIBC-Human Potential (launched in 2014)
- LIBC-Social (to be launched in 2015)

SYMPOSIA AND LECTURES

Symposia/Lectures organised by LIBC

Public symposium ‘Human Potential’.
Symposium on the occasion of the launching of the Hotspot Human Potential. Recent brain research, on optimizing and maintaining emotional and physical health, was presented and discussed.
Organisers: Prof.dr. Andrea Evers (Psychology, FSS) and dr. Lorenza Colzato (Psychology, FSS)
Number of attendants: 742
Date: 26 September 2014

Invited international lectures delivered by LIBC members: 137
LAUREATES

European Union

European Research Council
- Evers, A.W.M. Empowering expectations for health and disease: Training of the immune and endocrine system, Grant: € 2.000.000

Horizon 2020 COST Programme

NWO

ZonMW
- van Swieten J.C., co-applicants: van Luider, van Meurs, Rombouts, et. al., The disease process of hereditary frontotemporal dementia in the presymptomatic stage: a search for sensitive biomarkers, Grant: € 720.000

Onderzoekstalent
- van den Broek, P. The role of social cognition in the development of reading comprehension abilities: Evidence from behavioral, eye-tracking, and neuroimaging methods, Grant: € 171.362

VENI Grant
- Jepma, M. Neural mechanisms of pain-avoidance learning in healthy and chronic-pain populations, Grant: € 250.000
- Verkuil, B. - Je zenuwen de baas, Grant: € 250.000

VIDI Grant
- Alink, L. Changing chaos: the causal role of household chaos in child maltreatment, Grant: € 799.911

Zwaartekracht (‘Gravity’) program ‘Language in Interaction’
- ten Cate, C. J. & Fisher, S. (MPI-Nijmegen) - Neurogenomics of vocal learning, Grant: 1 PhD
- ten Cate, C. J., Vroomen, J. (Tilburg) & Formisano, E. (Maastricht) - Perception of multidimensional sounds in humans and birds, Grant: 1 PhD

Other Grants and Awards

Leverhulme Trust (UK)
- Clayton, D. (Queen Mary University of London), co-applicant: ten Cate, C. J. Neurogenomics of Perception, Grant: 1 PhD
CROHO (Leiden University)

- van den Broek, P. Optimizing Virtual Research Environments (VRE’s) for fostering research skills and motivation by scripting the collaborative learning process, Grant: € 50,000

Erwin Schrödinger Fellowship-grant


Diabetes Fonds

- Coomans, C., co-Pi: Meijer, J. H. The effect of dysregulation of the central clock on the development of obesity ans insulin resistance. Grant: € 275,000

Gratama Stichting, Leids Universiteits Fonds (LUF)

- van Dillen, L. F. Aandacht voor smaak. De neuropsychologische mechanismen van smaakbeleving. [paying attention to taste. The neuropsychological mechanisms of taste perception.], Grant: € 24,680

Dutch Neurofibromatosis Association

- Huijbregts, S. C. J. Cognitive and social functioning of individuals with NFI (consolidation grant). Grant: € 10,000

LIBC-RELATED PUBLICATIONS

International, peer reviewed papers: 244 (see our website: www.libc-leiden.nl/organisation/publications)

TRAINING AND EDUCATION

FMRI Analysis Course in the Psychology Master program: 24 MA students and 5 researchers (AIO’s and post docs) attended. Coordinator: Prof.dr. Serge Rombouts.


LIBC related PhD defenses:

- Stoutjesdijk, R., 16 January: Children with emotional and behavioural disorders in special education
  Promotores: Prof.dr. E. M. Scholte en Prof.dr. H. Swaab

- van der Haar, S., 12 February: Getting on the same page: Team learning and team cognition in emergency management
  Promotores: Prof.dr. M. Segers, Prof.dr. K. A. Jehn en Prof.dr. P. W. van den Broek
Meerman, E. E., 26 March: *Health Complaints; testing a causal role of activated illness-memory in symptom reporting*
Promotores: Prof.dr. C. M. Maes, co-Promotor: Dr. J. F. Brosschot & Dr. B. Verkuil

Kleinloog, H. D., 1 April: *Drug-induced psychomimetic effects as a model for psychosis*
Promotores: Prof.dr. J. M. van Gerven & Prof.dr. A. F. Cohen

Sabayan, B., 2 April: *Cardiovascular and Hemodynamic Contribution to Brain Aging*
Promotores: Prof.dr. R. G. Westendorp & Prof.dr. M. A. van Buchem

Schoenmaker, C., 16 April: *From Infancy to Young Adulthood: The Leiden Longitudinal Adoption Study*
Promotores: Prof.dr. F. Juffer & Prof.dr. M. H. van IJzendoorn

Jamal, M., 22 May: *Smoking and the onset, severity, and course of depression and anxiety disorders*
Promotores: Prof.dr. A. J. van der Does & Prof.dr. B. W. Penninx (VU Amsterdam)

van Nunspeet, F., 27 May, *Neural Correlates of the Motivation to be Moral*
Promotor: Prof.dr. N. Ellemers

Molendijk, M. L., 3 June: *The Role of BDNF in Depression*
Promotores: Prof.dr. B. M. Elzinga, Prof.dr. P. Spinhoven & Prof.dr. B. W. Penninx (VU Amsterdam)

Ketelaar, L., 4 June: *Beyond hearing: Social-emotional outcomes following cochlear implantation in young children*
Promotores: Prof.dr. C. Rieffe & Prof.dr.ir. J. H. Frijns

Drost, J., 10 June: *Worry and Rumination*
Promotores: Prof.dr. Ph. Spinhoven & Prof.dr. A. J. van der Does

Cárcamo Leiva, R. A., 17 June: *Childcare in Chile*
Promotores: Prof.dr. M. H. van IJzendoorn & Prof.dr. R. van der Veer

Doan, N. T., 17 June: *Quantitative analysis of human brain MR images at ultrahigh field strength*
Promotores: Prof.dr.ir. B. P. Lelieveldt & Prof.dr. M.A. van Buchem

Werner, C. D., 18 June: *Carefree in Child Care? Child Wellbeing, Caregiving Quality, and Intervention Programs in Center-based Child Care*
Promotor: Prof.dr. M. H. van IJzendoorn

Verschoor, S. A., 25 June, *Learning about goals: Development of action perception and action control*
Promotor: Prof.dr. B Hommel, co-Promotor: Dr. S. Biro

Davidse, N. J., 25 June: *Links between Executive Functions and Early Literacy and Numeracy*
Promotores: Prof.dr. A. G. Bus & Prof.dr. J. T. Swaab-Barneveld, co-Promotor: Dr. S. C. Huijbregts
• de Haan, A. M., 10 September: *Ethnic minority youth in Youth Mental Health Care: utilization and dropout*  
  Promotores: Prof.dr. R. R. Vermeiren & Prof.dr. J. T. de Jong (UvA)

• Kruijt, J. W., 10 September: *Depression Vulnerability: Studying Components of Cognitive Models*  
  Promotor: Prof.dr. A. J. van der Does

• Zalachoras, I., 17 September: *Selective glucocorticoid receptor modulation: targeting the brain under stress*  
  Promotor: Prof.dr. E. R. de Kloet

• Huijg J. M., 8 October: *Preconditions for the effective introduction of physical activity interventions for high-risk populations to primary health care.*  
  Promotores: Prof.dr. C. M. Maes, Prof.dr. B. M. Middelkoop, Co-promotores: Dr. W.A. Gebhardt, Dr. M.R. Crone.

• Nixon, J. S., 14 October, *Sound of Mind*  
  Promotor: Prof.dr. N. O. Schiller

• Chen, J., 16 October: *Linguistic Birds: Exploring the cognitive abilities in zebra finches by using artificial grammars*  
  Promotor: Prof.dr. C. ten Cate

• Niesters, M., 30 October: *Evolution of endogenous analgesia*  
  Promotor: Prof.dr. A. Dahan

• Verhoeven F. E. A., 6 November: *Rain with chances of a thunderstorm*  
  Promotor: Prof. dr. A. J. van der Does

• Prevoo, M. J., 19 November: *Bilingualism is more than just the sum of two parts: The family context of language development in ethnic minority children*  
  Promotores: Prof.dr. J. Mesman, Prof.dr. M. H. van IJzendoorn. Co-promotor: dr. M. Malda

• Ekmekci, H., 25 November: *Sensitive Parenting in Turkish Ethnic Minority Families*  
  Promotores: Prof.dr. J. Mesman & Prof.dr. M.H. van IJzendoorn

• van der Voort, A., 27 November: *The importance of sensitive parenting*  
  Promotores: Prof.dr. F. Juffer & Prof.dr. M. J. Bakermans-Kranenburg

• Sun, H., 4 December: *Time reference and bare predicates in Mandarin*  
  Promotores: Prof.dr. L. L. S. Cheng, Prof.dr. R. P. E. Sybesma & Prof.dr. H. Demirdache (Université de Nantes)

  Promotores: Prof. Dr. A.W.M. Evers & Prof. Dr. P.L.C.M. van Riel
**MEDIA APPEARANCES**

LIBC members increasingly participate in public events, such as the national *Brain Awareness Week* (organised by the Dutch Neurofederation) and other media events (newspaper, radio, television) about brain and cognition.

- Radio interviews: 21
- TV appearances: 9
- Magazines and newspapers: 94
- Science websites: 53
- University newsletter: 41

**EQUIPMENT**

LIBC members currently have access to the following equipment:

- 3T and 7T MRI scanners at the LUMC
- MRI dummy scanner at the LUMC
- Electrophysiological lab at the FH
- Neurofeedback lab at the FSS
- Psychophysiological lab at the FSS
- Infant labs (visual and auditory) at the FSS
- Systems for eye-movement measurements at the FH
- More than 20 labs for behavioral research at the FSS
- NIRS lab at the FSS
- tDCS lab at the FSS
- Phonetics lab at the FH

**STAFF**

Senior Researchers: 78
Post-docs: 17
PhD students: 96
Management assistants: 1fte
Laboratory technicians: 0.45 fte

- Witteman, J., 18 December: *Towards a cognitive neuroscience of prosody perception and its modulation by alexithymia*
  Promotores: Prof.dr. V.J.P. van Heuven & Prof.dr. N.O. Schiller
ORGANIZATIONAL STRUCTURE

Management Team:
  Prof. dr. Paul van den Broek (Education and child studies, FSS)
  Prof. dr. Bernet Elzinga (Psychology, FSS)
  Prof. dr. Claartje Levelt (Linguistics, FGW & Psychology, FSS)
  Prof. dr. Joke Meijer (Neurophysiology, LUMC)
  Dr. Onno Meijer (Endocrinology, LUMC)
  Prof. dr. Serge A. Rombouts (Radiology, LUMC & Psychology, FSS), chair
  Prof. dr. Nic van der Wee (Psychiatry, LUMC)

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  Prof. dr. Bernhard Hommel (Psychology, FSS)
  Prof. dr. Niels O. Schiller (Linguistics, FGW & Psychology, FSS)

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