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bcn

BCN - SCHOOL FOR BEHAVIOURAL AND COGNITIVE NEUROSCIENCES

university of groningen

DOUBLE INTERVIEW WITH ANDRÉ ALEMAN AND PETER DE JONGE

Recipients of the Prestigious NWO VICI grant

Recently, André Aleman and Peter de Jonge, principle investigators of the research institute BCN-BRAIN (UMCG), were awarded the prestigious VICI award (approx. € 1.500.000,-) by the Netherlands Organisation for Scientific Research (NWO). VICI grants are awarded to senior researchers who have shown that they have the ability to successfully develop their own innovative lines of research and can act as coaches for young, enthusiastic researchers. A couple of years ago, Aleman and de Jonge received NWO VIDI grants.

First of all, congratulations, both of you. Can you both describe (in a maximum of 3 sentences) the significance of your research projects?

Aleman
The aim of my project is to unravel the neural basis of apathy in patients with schizophrenia and to test an experimental treatment with neurostimulation (transcranial magnetic stimulation).

De Jonge
The significance of my research project "deconstructing depression" lies in the combination of the facts that on the one hand depression causes an enormous burden of disease while on the other hand depression treatments fall short of addressing this problem. My position is that this is due to a poor operationalization of the depression construct; depression according to the DSM-III and DSM-IV is hardly based on empirical grounds. In my project I will look for alternative operationalisations, based on empirical grounds.

What is the most innovative aspect of your project?

Aleman
The hypothesis of two different pathways in the brain that can lead to different forms of apathy and the use of transcranial magnetic stimulation to reduce apathy.

De Jonge
The most innovative aspect of my project is that I will apply state-of-the-art statistical techniques to improve the validity of affective disorders. This goes against the main stream psychiatry. Ultimately, this approach may lead to an entirely new way of classifying psychopathology.

In what way might patients ultimately benefit from the results of the projects?

Aleman
Currently, there is no effective treatment for apathy, so patients would benefit hugely even if we could only improve it partly.

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De Jonge
The starting point of my project was the failure of current treatments for depression, and my goal is to make a significant step forward in this. Only when depression is validly operationalized can effective treatments be developed.

VICI grants are awarded to projects that run several years. What are you hoping for 5 years to come?

Aleman
To discover cognitive processes and underlying neural systems that are involved in apathy. To improve treatment options for patients.

De Jonge
First of all, I hope that with this project I will be able to attract several highly talented PhD students and post-docs to carry out this project on the highest international level. If this project will lead to new insights regarding the classification of affective disorders, I hope this information will find its way in the upcoming version(s) of the DSM, ultimately leading to better care. For me personally, this project enables me to do exactly what I want to do: performing high standard, creative research in the field of psychopathology.

André Aleman, you recently published a book, 'Hersenspinsels'. What was the most remarkable and unexpected response to the book you received?

Aleman
I was humbled by the positive reactions from patients with psychotic symptoms and their family members who said the book helped them understand these phenomena. Most remarkable was that several readers contacted me to inform me that I made an error when I mentioned the doppler-effect that occurs when you hear an ambulance siren approach or move away from you as an illusion. From a biophysical point of view, they are right: it is not an illusion, as there is a real difference in the frequency of sound waves that reach your ear. However, my point rather was that, from a psychological perspective, naive listeners have the impression that the sound changes at the source, i.e. the ambulance is emitting a different sound after passing by. If you have this impression, it is an illusion, as the sound does not change at the source.

Peter de Jonge, are you planning to write a book like André and what will be the subject?

De Jonge
I grew up in the era in which scientists are primarily evaluated on the articles that they wrote and not so much the books. As such, I am a child of my time and I have no plans in that direction.

According to the Mayan calendar doomsday will be on December 21st, 2012. If this is true, what is the most important thing that you still want to do?

Aleman
Write a scientific paper proving the Mayan calendar to be false, so the VICI project can go ahead in good spirits.

De Jonge
In that case, I would like to quickly make an alternative Mayan calendar which would give me another 5 years or so complete my VICI project.

■ MICHIEL HOOIVELD

Prof.dr. André Aleman (1975) is professor of Cognitive Neuropsychiatry. He studied psychology at the University of Utrecht. In 1998 he started his PhD training at the same university on the project 'Hallucinaties: cognitieve functiestoornissen en fysiologische basis'. In 2001 he received his doctorate with honors ('cum laude') for his thesis titled 'Cognitive neuropsychiatry of hallucinations in schizophrenia. How the brain misleads itself'. Shortly after receiving his PhD he was awarded a NWO VIDI grant for research on emotional disorders in schizophrenia and in 2006 he received a European Young Investigator Award from the European Science Foundation for research into reduced illness insight in psychotic disorders. Currently, research of André Aleman is focused on mapping of brain functions involved in observing and handling of emotions and disturbances in patients suffering from psychiatric problems.

Prof.dr. Peter de Jonge (1969) is professor of Psychiatric Epidemiology, particularly depression and somatic illnesses. He studied clinical psychology at the VU University Amsterdam and received his doctorate from the VU University Medical Center (Amsterdam) for his thesis titled 'Detection of complex patients in the general hospital'. After his graduation he continued his research at the VU University Medical Center (Amsterdam), Washington University (St. Louis, USA) and University of California (San Francisco, USA). In 2004 de Jonge came to the University Medical Center Groningen and was supported by grants from ZON-MW and the Dutch Heart Foundation. In 2007 he received a NWO VIDI grant. Currently, research of Peter de Jonge is focused on the disease causes and treatment of affective disorders (including depression).

› HEAD OFFICE MATTERS

Dutch politics and academic internationalization

As its major policy, the University of Groningen supports the academic freedom of its staff and students as set out by UNESCO (1997): *'Higher-education teaching personnel are entitled to the maintaining of academic freedom, that is to say, the right, without constriction by prescribed doctrine, to freedom of teaching and discussion, freedom in carrying out research and disseminating and publishing the results thereof, freedom to express freely their opinion about the institution or system in which they work, freedom from institutional censorship and freedom to participate in professional or representative academic bodies.'* As co-signatory to the Magna Charta Universitatum (1988), the University of Groningen supports academic autonomy and independence and applies the codes of practice of the Royal Netherlands Academy of Arts and Sciences (KNAW) and the Netherlands Organisation for Scientific Research (NWO). (http://www.rug.nl/corporate/universiteit/Strategie/Strategienota)

Accordingly, the University of Groningen provides an international environment in which students and staff from throughout the world study and meet to exchange ideas and views. The University of Groningen thus educates its students to become emancipated citizens of the modern world, academically-minded and independent, actively engaged in society and prepared to shoulder responsibility anywhere in the world. The advantages of this policy are obvious and have yielded attractive international curricula and advantageous international collaborations both at an academic and an economic level.

BCN also hosts many international students including those from a variety of eastern European countries. It is therefore quite unnerving to observe the current trend in Dutch politics where a right wing party continuously walks on the edge of legality and seriously pollutes and damages the Dutch tradition of tolerance and constructive European union membership. Equally disturbing is the notion that the Dutch government is not taking a proper position in their policy as requested and suggested by many European politicians.

It may be clear that such a narrow minded policy goes against our national interests. For the Netherlands, international collaboration and scientific exchange are essential not only from an economic/commercial perspective but also from a cultural point of view.

PROF. ERIK BODDEKE

Meeting Richard Dawkins

Since December 2010 the Biology and Life Sciences Department at the University of Groningen has been housed in a new building: the Linnaeusborg at the Zernike complex. The recognizable green building named after the founding father of taxonomy Carl Linnaeus, was eventually inaugurated on January 13th 2012. For this occasion, a guest of honor was invited - no less a figure than famous evolutionary biologist Richard Dawkins.

Richard Dawkins is undoubtedly one of the most famous evolutionary biologists, atheists and authors of our time. On Thursday January 12th he gave a public lecture in the Nieuwe Kerk organized by Studium Generale and the Faculty of Mathematics and Natural Sciences. The run on the tickets was tremendous; 1000 tickets were sold in no time and reached extraordinary high prices on the black market, Groningen in a state of exception. To comfort all the ticketless, the lecture was streamed into three large lecture halls of the University of Groningen and also to the three partner universities in the U4 network at Uppsala, Göttingen and Gent. The topic of Dawkins' lecture was "Darwin's five bridges" in which he elaborated on the history of evolutionary theory.

The reason for Dawkins' visit to Groningen was, however, the opening celebration of the Linnaeusborg for which Dawkins was invited as the guest of honor. One item on the programme that was not open for the public was especially exciting for students: a debate with Richard Dawkins.

Student debate

In the beginning of December, students of the School of Life Sciences received an email saying that they had the opportunity to participate in a debate with Richard Dawkins about the topic "Evolution". In order to participate, the students of Linnaeusborg were asked to write a short motivation letter stating why they would like to meet Dawkins and to pose a question they would like to ask him personally. Based on the motivation letters, 24 students were selected, and I was fortunate enough to be one of them.

After receiving the exciting news of being one of the few people to actually meet Richard Dawkins, the selected students that came from various backgrounds ranging from evolutionary biology to marine biology to the BCN master met for a pre-debate, a meeting where the topic of the debate was introduced and the debate situation was practiced. Out of the selected motivation letters, the committee selected four statements that became the topics of the debate with Dawkins. Students were divided into those groups according to their interests. In preparation for the debate, the formed groups exchanged their thoughts in a forum on the internet and in individual meetings.

The day of the debate

The day of the debate eventually arrived, weeks of preparation, Christmas holidays spent with nothing but reading and discussing contemporary topics of biology and evolution, all came to an end when the preparations were put to the test. The debate took place in the Bernouillborg and the participating students were not only the ones present: The lecture hall was filled and the debate was also streamed into other lecture rooms.

Once all participants arrived and took a seat, a last minute change was announced: Dawkins arrived and told us that instead of debating for one and a half hours, he just wanted to debate for one hour. That shortened the time we had for each of the four statements from the different groups, down from 25 to 15 minutes. What we didn't expect was that Dawkins would really take his time for the answers. My group was the one to start, and after the first question was posed Dawkins talked for about seven minutes and did the same thing after the second question and then we had to move on to the next topic. This was a little bit disappointing for everyone: weeks of preparation, trying to figure out what Dawkins' opinion was about things and finding counterarguments to challenge him seemed like a waste. The debate more seemed like a question and answer session in the end.

Concluding thoughts

Even though the debate didn't turn out to be the heated debate we all expected and the hard work we all invested in didn't seem to be worth it, it still was a great experience. Meeting people from other study backgrounds and exchanging thoughts about difficult topics was definitely exciting. And we all can say that we actually met one of the most popular people in science. Who knows, maybe someday some of us will be the guest of honor on an event that he organized ;)

RICCARDA PETERS

Interview with Prof. Ritsert Jansen, our new Dean of Talent

For modern scientists, doing experiments and getting results is not enough anymore. With universities' budgets being cut by the government, the only way to pay for your post-docs and equipment is by getting grant money. However, the competition is tough. Special training for grant applications might just give you the little bit extra you need. This is one of the reasons why the University of Groningen has started the Talent Development Programme.

The Dean of Talent Development is Ritsert Jansen, a Professor from Bio-informatics who is not unfamiliar with this new task. Jansen is involved in the University's mentoring programme for female scientists and published the book "How to develop your talent in science?" with Cambridge University Press in 2011. His second book "Funding your career in Science" will be published this year. Jansen has an impressive curriculum vitea as a scientist, with publications in high-impact journals and success in grant-applications. Jansen is a Vici Laureate. Jansen: "Writing for grants is in the first place having a great idea, but after that financing and marketing come around". Without financing and marketing for your research, your chances are very low of getting a grant and progressing in your career. So being able to get your research financed is very important. If not, then, as Jansen says, "you will not be able to progress."

In the talent development programme, Jansen is joined by Margot Edens from Human Resources. Together they are building a programme to assist scientists from the post-docs level up to full professors in making the most out of their career. Jansen: "We have an honours college, a graduate school, and then it stopped". With the Talent Development Programme Jansen wants to fill this empty space, but it is not the only purpose of the programme. As he says, "We want to take the education in personal and professional skills much more serious and make it more visible".

As said, the competition for grants gets tougher all the time. Especially because many grants are personal grants like for example the NWO Veni, Vidi, and Vici grants and the ERC starting and advanced grants. To get these grants, you are not only competing with people from your own field, but also with scientists from other fields. So as a psychologist, you are competing against biologists, mathematicians, or pharmacists. And the reviewing committees are just as diverse. So how do you convince them that your idea needs to get the grant? According to Jansen, writing grant proposals is the ultimate way of writing because you give your vision about the future. Jansen: "You need to phrase it in such a way that it is plausible and exciting enough, so that the reviewers think 'We want

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to know the answer, so let's finance this project'". Part of the Talent Development Programme is to provide courses to improve grant writing skills, but also training on how to write an excellent scientific article and more.

Although the Talent Development Programme is still under construction, there are already events up on the calendar. From May 21st till 25th, Jansen and colleagues organise a Grants Week. The programme is not fully decided upon yet, but some things are already known. Jansen: "This year a science journalist will give a workshop in writing and it looks like a Nature editor might be flown in". Also on the programme are workshops, a day during which companies and scientists can meet, and opportunities to meet Vici Laureates and member of different committees, and more.

Overall the Talent Development Programme offers modern scientist the opportunity to develop skills, which will help them in the tough competition for grants and to maximise career opportunities. Jansen: "It is crowded if you and someone else have exciting ideas. If the other is better able to put it in words in an exciting way, you end up empty handed".

For more information about Grants Week: www.umcg.nl/EN/Research/Events/Events/Pages/Grantsweek2012.aspx

RENSKE BOSMAN

Website

The Talent Development Programme will have its own website up very soon. A link will be available from the University's homepage. The website aims to improve, structure, and simplify helpful information about workshops, experts in the field, literature, etc.

Introducing new editors

› Renske Bosman

Last September I started the BCN research master's after having finished my bachelor's in psychology, also at the University of Groningen. In the second year of my bachelor's, I did a research internship and this experience suddenly made continuing in research a realistic career perspective. So the next logical step on the scientific ladder was to apply for the BCN research master's. I was so pleased that I was accepted. About a month ago I was asked to join the BCN newsletter crew, which sounded like a good opportunity to meet new people and to practise and polish my (English) writing and interviewing skills.

INTERVIEW

Prof. P.P. (Peter) de Deyn in Groningen and Antwerp

Thank you for this interview. I have heard you are a specialist in the field of dementia and a Professor at the University of Antwerp. Since October 2011 you started to work also in Groningen as the Director of the Alzheimer Center. What made you come to Groningen?

I have come to Groningen because quite a lot has been achieved in Antwerp. Many projects have been realized and are still ongoing. I am still partially active at the University of Antwerp and the Institute Born Bunge. At the University of Antwerp I am mainly focusing on neurodegenerative disorders with cognitive impairment such as dementia. The challenge and the added value of coming to Groningen would be on one hand the opportunity to work on a larger scale, and on the other hand more focused on specific topics. In the past, I was also chairman of a neurology department which resulted in a lot of work and responsibility not immediately related to my favourite expertise field of dementia and related disorders. Now that I do not have to do that anymore, I am much more focused which will hopefully result in still more significant scientific output. Another reason to come to Groningen is that fact that I think we still have to prove something here. We still have to expand our activities in the field of dementia and related disorders and to fully apply our expertise and know-how in the field. Also, there is a huge tradition here with regard to research in the field of dementia, preclinical as well as clinical. For instance, a lot of animal modelling is taking place here and there is a great deal of dedicated clinical research as well. At this university, protein expertise and expertise in the field of functional and molecular neuroimaging is present within the department of nuclear medicine and molecular imaging. Therefore, a lot of functions that are altered in dementia can actually be visualized and better studied. Groningen has a specific expertise in the field of dementia, and thus added value with regard to animal as well as human neuroimaging.

Could you expand a bit on what your activities are in Antwerp?

In Antwerp I am director of the Institute Born Bunge and I head a research unit there which is named Laboratory for Neurochemistry and Behaviour. We study neurochemical alterations, such as neurotransmitters, and behaviour as well in transgenic animal models as in the human condition. That ranges from in vivo research to port-mortem research. We also have a brain-bank over there with about six to seven thousand brains, which is very actively recruiting. Within three to four hours post-mortem we perform obductions or autopsies storing samples for neuropathological validation and molecular analyses. Of course that yields a lot of material that can be used in further translational research to develop diagnostic and prognostic parameters and to discover new drug targets. We correlate biochemical parameters but also genetic parameters to specific phenotypes in our animals and in human subjects. Additionally, we focus on the behavioural and psychological symptoms of dementia (BPSD) which are, among others, psychosis, depression, and aggression. Fields of aggression and anxiety and so on are also very interesting with regard to in vivo receptor imaging. This is one of the significant aspects that brought me here. One of the major advantages when Antwerp and Groningen combine their technological assets and expertise will be the ability to study BPSD and correlate the symptoms with neurochemical changes using in vivo molecular imaging. BPSD are very prominent and are often the first alterations which are noticed in dementia syndromes. BPSD usually bring the patient to the medical profession. Families often

› *Dementia is not only cognitive decline.*

seem to be relatively tolerant towards memory loss, but behavioural alterations like changes in circadian rhythms, aggressiveness or psychotic features are more easily picked up and they often lead to medical attention and even institutionalization.

What are the most important differences between Antwerp and Groningen?

It may be a little bit too early to answer that, but I will try to. I think that many people in Groningen are really very much involved in the scientific aspects of the disorders that they are dealing with. Research is very well conceived and designed here. Not that I have to complain about Belgium, but I still have to experience fully what really will be the differences. Maybe I should not say this, but sometimes people state that there is a little bit too much discussion and/or concertation in the Netherlands, although I have not been victim of that, yet. I think many things are very well organized in Groningen, however sometimes I would like things to go a little bit faster. Nevertheless, we are in the starting phase at this moment, and then you cannot yet work very rapidly. Still, I think that we do things a little bit faster in Belgium sometimes without really preparing projects into full depth, because we just go for an idea a little bit sooner. The clinical practice is also clearly different. In Belgium, for example, people have free access to memory clinics in a way of speaking. They can call a clinic and in a couple of weeks they will be seen by a team in order to get the full work-up for their memory complaint while the Netherlands is famous for their guidelines and their flow charts. Thus, there are different practices, but I think that Groningen and Antwerp both have advantages and disadvantages. I am trying to combine the best out of those two worlds. I would like to mention that we have a memory clinic in Antwerp which I founded. I am not director of the clinic anymore, because that would be impossible to combine with the responsibilities here. Nevertheless, we still have a very close collaboration and quite a lot of patients from the Antwerp memory clinic enrol in investigator-initiated trials or other (among others diagnostic) research.

Why did you become interested in cognitive impairment and dementia?

When I started my career I was mostly involved with epilepsy; I studied the basic mechanisms of the pathogenesis of epilepsy. At that time, I did cellular electrophysiology work in the USA and later in Antwerp and later on also in vivo work with a lot of animal epilepsy models. As time went on I became more and more interested in dementia, because it has such a broad clinical picture. Dementia is not only cognitive decline which involves many cortical functions besides memory impairment, but it is also a very complex disorder in terms of its behavioural and psychiatric and/or psychological symptoms. Dementia actually touches the human mental being, spirit or personality and it is very pervasive. It allows you to approach human beings in total, more holistically. Another issue is the demographic evolution where dementia and some other neurodegenerative disorders become a major burden for society. Not only medically, but also economically and psychologically, so I think we have a major challenge in trying to resolve that. Performing decent diagnostic work and good preclinical studies in animal models improves our insights in the pathophysiology of dementia and allows us to identify specific drug targets. In the end, treatment is the whole aim and the whole motivation, of course.

What are your personal research goals?

First of all I would like to facilitate as much as possible valuable Alzheimer and related ongoing research in this institute. My goal would be to motivate as many people as possible and to bring them together, so I will try to achieve as much as possible concerted action in this university under the umbrella of the Alzheimer research centre. I believe that my personal goals should be those which one can achieve within the context of the expertise of this university. As I mentioned already, the psychiatric aspects of dementia are important and within this institute there are experts in this domain who are fully motivated to collaborate. I am referring to the department of psychiatry and the old-age psychiatric people. In addition, we have quite some people in analytical laboratories which are experts in proteins and protein folding and in the development of diagnostic markers. Their specific expertise has added value. We need to establish large cohorts of patients with mild cognitive impairment (which precedes dementia), Alzheimer's disease (the most common dementia) and controls. Then new breakthroughs can be realized in diagnostic markers. One other significant part is functional neuroimaging to further clarify why a given patient has a specific clinical or behavioural phenotype, because only by knowing the underlying pathophysiological alterations we will be able to modulate those and to control them in a very well directed fashion. For example, we use in certain indications different types of antipsychotics which reduce some of the behavioural and psychological symptoms of dementia, but we should have individually tailored interventions which can be pharmacologically but also behaviourally. I think contributing to personalized treatment is really a major issue. This university is also very concerned with healthy ageing. I think that we have an opportunity there called LifeLines which is an ongoing longitudinal study where 165.000 people are to be enrolled. It will provide a major database with which one could further elucidate or clarify the environmental and other issues contributing to the development of mild cognitive impairment and/or Alzheimer's disease. This unique database may teach us how to prevent

›› CONTINUATION INTERVIEW WITH PROF. P.P. (PETER) DE DEYN

the development of these diseases in individuals and how to age successfully. This is very important epidemiologically-based research and one of the aims would be to add some specific Alzheimer research to LifeLines.

What can we do to prevent dementia at this moment?

Wow! There is not so much, but I will rephrase. There is a Latin saying: Mens sana in corpore sano; a healthy mind in a healthy body. Overall optimal physical exercise is recommended. Exercise has been shown in some studies to be preventive in the development of cognitive decline or dementia. Of course, it is not fully preventive, but a good lifestyle is important. Next to exercise, also dietary issues matter. It is beneficial to take care of your lipid intake in order to prevent vascular events or to refrain from smoking, for example. Regularly there is a vascular component to dementia syndromes and lifestyle is something one can control. Another issue is mental exercise which will increase your cognitive capacity. It does not prevent dementia and related disorders, but it may postpone the development of symptoms, because your brain is better trained. Thus one could implement healthy food intake, no smoking, physical and mental exercise on a personal level.

What do you think is a good treatment for dementia once it has occurred?

I think the treatments we have now, acetylcholinesterase inhibitors and memantine (NMDA receptor modulator), have a proven symptomatic effect. The effect size is moderate, but it is substantial. Of course, certain patients respond better than others, but one can improve symptoms in responsive individuals above baseline for a period of one to two years which is significant. We do not have to be ashamed of the fact that the treatment is only symptomatic, because that is the case for a lot of neurological disorders like Parkinson's disease and epilepsy. The big challenge is to develop treatments that reverse the underlying disease process, treatments that induce a cure. Worldwide many researchers attempt to develop such treatments based among others on anti-inflammatory strategies, interference with the beta-amyloid (Aβ) cascade via reduced production of Aβ, limitation of Aβ aggregation or by dissolving Aβ aggregates in the brain. At this moment, we have passive and active vaccination therapies under development as well. At a given time point, there should be a breakthrough, but so far we did not find it. In animals, some of the therapies seem rather efficient, but this was not fully generalizable to man so far. Consequently, we need to go on and that is why it is also important that Groningen optimizes its Alzheimer research.

Is there anything else you would like to share with the BCN community?

Well, people ask me regularly how I feel in Groningen and it is actually a very, very nice city. I think Groningen is very attractive and so far the interactions with all the people have been fantastic. I have been very well welcomed and so many people are really involved in the ongoing process with regard to our Alzheimer research. There is a lot of sympathy, empathy and support here. I am confident about our Alzheimer research future and not forgetting the wellbeing of and care for people with dementia.

DAFNE PIERSMA

AN INTERVIEW WITH CHILD AND ADOLESCENT PSYCHIATRIST AND ASSOCIATE PROFESSOR PIETER HOEKSTRA

What makes you tic?

Most of us know at least one or two people with an obsessive tendency to make certain movements or sounds repetitively. These behaviors are called tics. Some cases are mild and not particularly distressing, such as moving with the tongue while drawing, but others are more severe and can have a large impact on a person's quality of life. These persons might be suffering from what is known as a tic disorder, a spectrum of disorders within which the well-known Gilles de la Tourette syndrome lies. Although it is known that tic disorders are strongly heritable neuropsychiatric disorders, not much is known about the exact genes involved. To work on this lack of knowledge, Dr Pieter Hoekstra, child and adolescent psychiatrist at Accare and associate professor at the UMCG, has recently received two large grants for research in the field of Tourette syndrome: a European grant of 6 million Euros and an American collaborative grant of 1.5 million dollars. I had the opportunity to interview Dr Hoekstra about this excellent achievement.

Dr Hoekstra has been involved in the field of Tourette syndrome for many years. In 2003, he presented his somewhat controversial PhD research hypothesis of Tourette syndrome as an autoimmune disorder. One of the many reasons to suspect this kind of 'friendly fire' was the interesting finding that the onset of tics in Tourette syndrome often occurred four weeks after a common cold virus infection. After his promotion, he has continued clinical work and research on Tourette syndrome and ADHD, and the comorbidity of both. Many suspects, like the gene for the dopamine receptor D4, have been investigated as putative causes for the disorder.

But according to Dr Hoekstra, the relationship between genes and Tourette syndrome is complex. As is the case in disorders such as Schizophrenia, there is no single causative gene, but a complex interaction between genes and the environment. A heterogeneous disorder like Tourette syndrome demands a large-scale longitudinal approach wherein many variables and factors are included. With the received grants, Dr Hoekstra is able to finance such a large research project.

The European grant is a collaborative grant from the Health programme of the European commission. It is part of the so-called Seventh Framework Programme (FP7), which supports international cooperation. With this grant Dr Hoekstra is funding a five-year long international research consortium called EMTICS, which started in December last year. Its aim is to disentangle the genetic and environmental factors that influence the onset and the severity of tics. The project runs in 26 different institutions across Europe, including the UMCG in Groningen. Dr Hoekstra coordinates the entire project. The research consists of two clinical groups. The first is a group of patients between 6 and 16 years of age, that suffer from Tourette syndrome. In this group, tics are naturally waxing and waning and the aim is to discover what factors make tics worse. The second group consists of high risk children bellow the age of 10. The term high risk means that they have first-degree relatives who suffer from Tourette syndrome, such as parents or siblings. About one third of these high-risk children will develop the disorder some point in their lives, so the aim here is to discover which factors relate to tic onset versus no tic onset.

What kinds of methods are used? On the one hand questionnaires are utilised, including measures of tic severity, rating scales for the presence of comorbid neuropsychiatric disorders and diary type questionnaires. On the other hand there is the technical aspect, which mostly consists of blood measures. Therein a range of factors is explored, such as autoimmune factors and gene expressions within lymphocytes. Also, in parallel, an animal model is used.
The American grant funds research with a different approach and focuses exclusively on genetic background. Herein one large extended

family of which multiple members suffer from Tourette syndrome is examined. Dr Hoekstra and his team hope that the genes that correlate with the disorder can be revealed using a method called whole exome sequencing. This project will take three years and started in July 2011.

At the end of these projects Dr Hoekstra hopes to have more definite answers to certain putative hypotheses, such as the involvement of autoimmunity. He is, however, very modest in his expectations. Tourette syndrome is a very complex disorder and requires much more research. Although 6 million Euros seems like a healthy resource, it is not even enough to cover other important angles of research, such as fMRI studies. Therefore, as if he never rests, he has already applied for another grant.

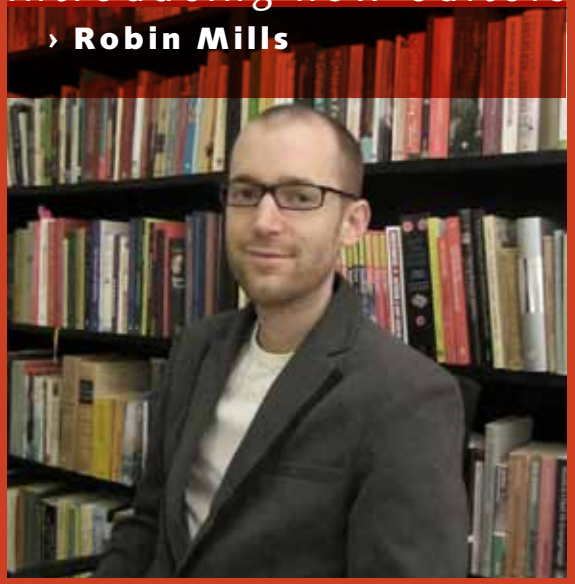
Because many of the BCN newsletter readers are students or researchers who are just starting out, I wondered if Dr Hoekstra could explain how he managed to apply for these grants. He described the process for the European grant. Basically, there are calls issued by the European commission for a wide range of topics in medicine, including various cancers and brain diseases. Scientists can apply for one of these calls by handing in a research proposal. But the thing to do is to make sure your topic is included in the list of calls. So Dr Hoekstra went to Brussels to let them know that he was interested in this topic and that they should include it. He had a great deal of contact with politicians in order to persuade them to lobby for him and to support him throughout the process. The trip to Brussels was a success and the topic was included. The process then involves two stages. The best research proposals 'go through to the next round' and there is another selection procedure. If you get through both rounds successfully, they won't give you the money straight away. First, a round of comments and suggestions on how to make minor revisions needs to be 'endured'. But the good thing is that you then already know you're in.

When I asked him if he had any other future career plans, he smiled. "Well, seeing as I just received such large grants, I'd better continue working on Tourette syndrome." He said "and you can never predict what life will bring you in the future". But above all, he would like to focus more on ADHD and neuroimaging. There is a strong comorbidity between ADHD and Tourette syndrome. About 50% of Tourette patients also suffer from ADHD. In the future Dr Hoekstra hopes to draw his research on ADHD and Tourette closer together.

■ ROBIN MILLS

Introducing new editors

› Robin Mills



About Me: Trying to be Different in the Wrong Situations

There are numerous ways of writing a short biography. For instance, one could attempt to squeeze in one's entire life story. The grave danger is that you bombard the poor readers with a shower of woefully uninteresting and tediously random life events, such as: "Feeding my rats when I was seven gave me the confidence to speak in public". Alternatively, one could opt for 'making it funny'. Oh dear, there is nothing worse than introducing yourself to a new audience with a forced and painfully flat joke. You'll be wallowing and floundering, seeing your reputation go down the drain. But by far the worst thing one can do is to write some sort of cynical, pseudo clever meta-analysis about writing bios as a bio. This is absolutely not done.

Interview with Natasha Maurits, Professor in Clinical Neuroengineering and author of the book *From Neurology To Methodology And Back*

You're a professor in Clinical Neuroengineering, could you briefly explain what this means?

It's a complex name for a research field; it has so many factors in it. What it means is that I start with a clinical neurological problem, for example, how can we improve the differential diagnosis between certain neurological disorders, and then I try to solve such a problem using mathematics, physics and engineering approaches. And after doing that, if I'm successful, I also try to translate that back to clinical practice. So I go from clinical neurology to basic sciences and back. That is the field of Clinical Neuroengineering.

Wow, it sounds really complicated. Can you give an example of how that would work?

It's not always that complicated. An example I often give is that we use muscle ultrasound measurements to diagnose neuromuscular disorders, such as Duchenne's Muscular Dystrophy. What used to be done is that physicians look at these pictures and they try to determine from the images whether the muscle is normal or not. The general rule is that when the image is whiter it's a bad sign. But how do you decide that the image is white enough to be pathological? And also if you're starting treatment, it would be good to see what the effect of this is on the muscle; whether it improves or not. The old scales are just more or less qualitative; if you have a scale from say 1 to 5, you can't discern small changes in muscle aspect. So our question was: how can we improve that? It's not a very difficult solution, we just made use of the fact that images can be analyzed quantitatively. They're just pixels; white has value 255 and black has value zero and all other colors have values in between. So we looked at mean values, and at the variability of those values. Besides just looking at how white the image is, we also look at how many spots there are in the image and how these can be quantified; how homogeneous is the image, things like that. And then we found out that indeed this type of quantitative analysis helps to make a distinction between disorders that originate from nerve disorders or disorders that really originate from the muscle itself. So that's an example of how you can use not even that complex methods to improve clinical diagnosis.

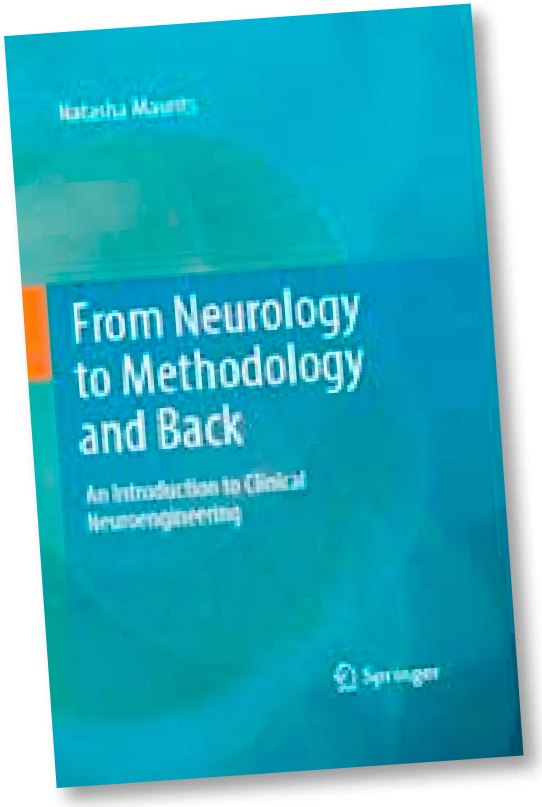
So because you made it more quantitative, you could actually improve the way the diagnosis was made.

Yes, and you can make small distinctions now also, so it's being extended. There are some applications in Spina Bifida, also, and even prenatal ultrasound has been analyzed in this way.

How did you get to where you are now in your career?

Well, it hasn't been exactly a straight line. I started as an applied mathematician and I always thought that it would be more interesting to apply mathematics instead of doing the more fundamental, theoretical mathematics. Actually I did a masters project in calculating flow around airplane wings, so that's totally different. And then I decided that I wanted to do research, that I didn't want to go into industry right away. I looked for a PhD project, and then I ended up in a biophysical chemistry department where I worked on models for polymer mixtures, such as shampoos or paints, and I tried to improve those models to incorporate physical and chemical principles. So that was really a lot of mathematical stuff. I did a lot of equation derivation, proving theoretical concepts and implementing them in programmes. And then, after that, it was a time when it wasn't easy to find a good position at a university, you had to do a post-doc and another post-doc and hope that some position would become available. So I decided I still wanted to do research, but in a more practical environment. It could have been industry also, but then

›› CONTINUATION INTERVIEW WITH PROFESSOR NATASHA MAURITS



a position opened in this department to do research. The position was for a Biomedical Informatician. They actually were looking for a clinical physicist, which I wasn't, but I thought 'well, this looks very interesting, I would love to do that'. They liked me and I liked them, so I started working here. And then after a couple of years I realized that I didn't have any room to grow. This was the position, and there were no senior positions or something to grow into. At that moment the Faculty of Natural Sciences just started a tenure track system, which means that you don't have to wait for a professor position to open, but you can grow towards such a position. So you just start maybe as a post-doc, or as assistant professor, and if you perform well and if you're hitting your targets, you can advance to be an associate professor and finally a full professor. I first applied to such a position at the Faculty of Natural Sciences because there wasn't such a system yet in the medical faculty. They offered me a position at the Faculty of Natural Sciences, but I really liked working here at the university hospital. So I asked around and then they told me that they were actually thinking about starting a tenure track system in the medical faculty as well. In the end I was appointed as one of the first people to start in the tenure track system. That was in 2003. Well and then I slowly progressed and last year I became a full professor. And that's how it went. So it was not really a straight line.

We've heard that you have a very busy life with many projects and students, as well as hobbies like painting. How do you find the balance between so many interests?

It's often difficult, but it appears that time is always a bit flexible so you can always put more activities in the limited time that you have. But of course there is an actual limit to that. I try to be critical of what I do, but that's also difficult, because it means that you have to say no to projects you actually would like to do and that you have to stop doing certain activities. I have the advantage – maybe that's not the right word to use – that I don't have children, so that gives a little bit more time in the evening and back home. So back home it's rather easy. And it's a matter of sometimes putting a lot of effort in your work and then after a very busy time I always try to get a little bit more time for the other stuff. I try to find a balance in that, because I function best if both parts get their time.

So you don't drown in one or the other.

No, and a good example is: for a long time I didn't do so much painting. I always thought 'Well, I can do the painting later.' And some time ago I thought 'Well, maybe I can't do the painting later. Why wait?' So I'm now doing a course every week for a few hours. And actually I make up for that time, doing a little extra in the evening or weekends. But at least I paint every week so that's really nice to do. It also frees the mind of other stuff, so maybe taking time for other activities works even better than just working all the time.

Would you advise people to get a hobby?

I guess I can't speak for everyone. For me it works well: it gives me balance. Maybe I'm saying that it even helps to find the balance to actually have these different topics in your life. It can also be family of course, if you go home to your family and your children ask for your attention that's very healthy too; to get out of your job a little bit and spend time on other things. I think it's good to have other things to do.

You were the chair of the BCN newsletter a while ago, are you still active within BCN?

Since I am a BCN member, I've always been active, I think. Currently I'm the chair of the Educational Committee within BCN. Related to that position I'm also in the Educational Committee for the Graduate School, and I'm a member of the board of BCN. And I usually do a lot of small things. For instance, at the BCN meeting I supervise a poster group and I judge thesis summaries for the BCN summary prize award. Small things like that. I go to the PhD retreat sometimes as a senior researcher to give feedback to students giving talks. So I've done a lot of things. One other thing I'm now doing for BCN is actually nice to mention. I do this together with Deniz Baskent, who is the current chair of the BCN newsletter. We're organizing a meeting for all BCN senior researchers, so post-doc and up, similar to the PhD retreat. The goal is to get people to know each other better through a platform where they can exchange ideas with each other. It's going to happen for the first time in April. So we look forward to that, and hope that people come of course.

›› CONTINUATION INTERVIEW WITH PROFESSOR NATASHA MAURITS

You have recently published a book called From Neurology To Methodology And Back. Can you give a short description of what it contains?

Well maybe from the introduction I gave you about Clinical Neuroengineering you already understand where the 'From Neurology To Methodology And Back' comes from. That sort of describes what I actually do. The book is a textbook, meant for master students or anyone interested in learning something about Clinical Neuroengineering. I got the idea maybe five years ago or so, when I was teaching the residents here in the department and I noticed that I started a bit too basic. Being a mathematician I talked more about methods, but that didn't really work. It helps if you know what the practice is and where you start from, what the problem is that you actually want to solve, like the title says. I realized after some time that there wasn't actually a textbook starting with practice. So, for instance, if you're talking about a mathematical method, like spectral analysis or Fourier analysis, then you have lots and lots of books about that of course and then maybe in the end of this book you will have a few example clinical cases. I thought that it would be nice to start from the examples, to start from the patient cases and then work your way into the methods. So now that's what happens in my book. Every chapter starts with one or two patient cases and I explain what kind of method you could use to try and find a diagnosis for these patients - so that could be the muscle ultrasound measurements or EEG or EMG - and then I explain on an even deeper level what kind of mathematics or physics you would need to actually do something with the data that you collect. And then I go back up, to show how you can use these methods to find a diagnosis for these patients that are introduced in the beginning of the chapter. I think that's quite unique. There's no such book in this field that actually does that. So I hope that people will like it and will pick it up.

What kind of master students would use this book?

Well the first people to think of are all the people that are working on the boundaries of these fields. So from the more fundamental studies to the more medically applied, like biomedical technology or technical medicine. But the book is also meant for the people here, the residents in Neurology, that have to work with these methods. Maybe also even applied mathematics students who are interested in seeing where the methods that they learn are applied. It could be a whole range of students. I know that in the Biomedical Technology department they're already using a case of my book. Those students were asking: 'Can we please have examples early in the study to find out how we can actually use all these methods that we are studying?' They are not only using my case, but other cases as well. These cases are going to be presented throughout the master years and they will return every time you learn something new, so that students can say: 'Oh, this method I can use in this way in this particular patient.' If my book is going to be used like that, that would be really wonderful.

What is the advantage of writing a book over publishing scientific papers, in your opinion?

Well for me it was very nice not have a format that I had to adhere to, so I just thought that this is the way it had to be written and there was no-one saying to me: 'No, you first have to give an introduction, and you can't use more than so many words.' I had to deal with the publisher of course and the whole book couldn't be more than 250 pages, and I couldn't have more than so many pictures, but they were quite flexible. And my style of writing was free. It was just very nice to have your own ideas and to be able to express them on paper in a way you thought was best. So that's a big difference between writing articles and writing a book.

So is there a big difference between the style of writing a paper or a book?

I think so, yes. It's a little bit more informal in a book and it's also on a different level of course, because most of your scientific work is really deep into your own field and here I really tried to explain something. So you use different styles to try and do that, and you use examples that you wouldn't use in a scientific paper.

It's a little bit more educational.

Yes, more educational, more attractive and then also there are tips and tricks in this book and I also describe them in a quite informal way. For instance, when you encounter something like this, you should remember that, and maybe approach it in this manner. You would write that partly in some scientific papers but not in the way you write it in such a book. It's really what I like to do: the style that I use

is personal and someone else would do it in a different way. It was very nice to just express your own thoughts on how you thought it had to be.

How long did it take you to write the book?
I once calculated how many hours it actually took, including making all the pictures, which was also a lot of work. I think it was about half a year. That was spread over approximately two years, from having the contract with the publisher to actually sending them all my stuff for publication.

When did the book actually come out?
The 29th of October, last year. That was the official publishing date.

And have many people bought your book already?
I don't know. There is an overview of people who downloaded the digital chapters on the website, because you can also buy the digital content. So I can follow that, but I don't know how many people have actually bought the hard copy of the book. I've heard from people of course that they would buy it or have bought it, but I don't know how many were sold in total. In April I will get an overview from the publisher. You don't write a book like that for making money, you do it because you feel that such a book is necessary and I would really love it if some college would use it in one of their classes. That would really be nice.

Is there any way that you tried to advertise your book?
Well of course I mailed everyone I thought would be remotely interested in such a book. There are a few programmes in the US that teach Clinical Neuroengineering, so I also approached them. And I'm a member of a UK-based institute for physics and engineering medicine (IPEM) and they are going to review my book, they told me. That would be nice: to have a review in their magazine that they send to all their members. I try to do what I can and I hope that the publisher, Springer, also does the best they can. So let's see what happens.

If we would like to order your book, where can we order it?
You can order it directly from the Springer website: you can go to www.tinyurl.com/clinneuroeng and then you get to the website.

Is there anything else you would like to tell the BCN community?
Well, maybe that if you have such an idea it's really worthwhile to pursue it. It's not easy, because you have to make the time to actually write the book of course. A lot of people only do it after they are retired. But it's really also a lot of fun and really nice to work on something like this; a project that you define by yourself and are able to complete in this way. And I also thought that Springer was very supportive in helping me accomplish this. They were enthusiastic from the beginning and always quite nice when I had questions. Of course you have to do the writing by yourself. But I think if you have a good idea it's really worth trying to make it into something real.

EMILY DE HARTOG

Introducing new editors

› Emily de Hartog

When I first heard about the BCN research master's, I immediately knew this was what I wanted to do. To my delight I was accepted into the programme and I started in September 2011. Soon I will begin a minor research project in molecular chronobiology, which I'm really looking forward to. When I joined the BCN newsletter I was hoping that, in an active and involved way, it would allow me to learn more about the diverse research fields that BCN has to offer. And even after only one interview this seems to be the case, because I have discovered a whole new research field that I had never heard about before! I'm looking forward to learning more and meeting new people.

Interview with Elise Roze, a former MD/PhD student, who received a PhD with honors ('cum laude'), and is an author and co-author of 13 articles.

Please introduce yourself! What is your background?

In 2004 I started with Medical School. In my third year, I developed a special interest in scientific research in Pediatrics. I started a small research project in the department of Neonatology of the University Medical Center Groningen. This project generated some interesting results, and I discovered that participating in a research project can be very challenging and stimulating. Together with my supervisor Prof. Dr. A.F. Bos, I wrote a grant proposal for an MD/PhD trajectory. In this trajectory, Medical School is combined with a PhD project for which one gets 2 years extra time. This is how my research career started. I finished my PhD project in December 2011, and I recently also finished Medical School, and now I am working as a medical doctor in the department of pediatrics.

What was the topic of your thesis? What were the main findings/conclusions?

The topic was the functional development of newborn infants with perinatal risk factors for adverse outcomes at school age. We showed for the first time that the transplacental transfer of brominated flame retardants is associated with the motor, cognitive, and behavioural outcome of healthy newborn infants. Because of the widespread use of these compounds, we concluded that these results cause serious concern. In addition we found that in preterm children with periventricular hemorrhagic infarction, the majority had cerebral palsy with limited functional impairment at school age. We concluded that the functional outcome at school age of preterm children with this brain lesion was better than previously thought. On the contrary, in infants with systemic disease in the neonatal period such as necrotizing enterocolitis and late-onset sepsis, we found that the outcome at school age was worse than one would expect. Their intelligence, for example, was barely better when compared to preterm children with severe brain lesions. Because of this, in this thesis we advocate the inclusion of measures of motor, intellectual, neuropsychological and behavioural functioning in a follow-up programme. An adequate follow-up of newborn infants could lead to the early identification of functional impairments so as to identify opportunities for early intervention.

What do you think makes your research field particularly interesting? What fascinates you about it?

The field of Neonatal Neurology concerns the fascinating topic of brain development in young infants and how this is influenced by a number of factors, some of which we are aware of but also numerous factors that still need to be uncovered. I find it fascinating to unravel these factors and to be able to contribute to improving the long-term outcome of newborn infants at risk.

What are your research interests now? What are your plans for the future?

I am currently working as a clinician in Pediatrics. It is my ambition to become an academic pediatrician and to dedicate future research towards improving the neurodevelopmental outcome of newborn infants at risk and towards understanding the underlying mechanisms of perinatal brain injury.

FLORIAN SENSE

Interview with Barbara Nordhjem

In 2011, Barbara Nordhjem completed her research master degree in Psychology at the University of Leiden. Her master's thesis won the Annual Dutch MSc Thesis Award for Neurosciences. Her project was carried out at the Laboratory of Neurobiology at University College London and her external supervisor was the renowned neuroscientist Semir Zeki. I had the chance to interview Barbara about her thesis and her plans for the future.

Please introduce yourself! What's your background?

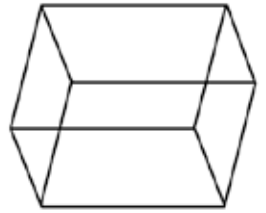
I have a rather mixed background and did quite a lot of things before I went into cognitive neuroscience. I did my bachelor in psychology in Denmark, but I was not really sure if I wanted to continue in that direction. Instead I started a festival for live visuals and electronic music and started making videos for musicians. Then I moved to the Netherlands and had the opportunity to work at the media art institute V2_ in Rotterdam. There I learned a lot about artists and scientists collaborating and researching perceptual experiences so this job was really an eye-opener for me. I started reading a lot of neuroscience articles and felt like learning more and studying these theories in depth. Finally, I enrolled for a master's programme at Leiden University where I had the chance to focus on cognitive neuroscience and learn from some inspiring researchers. During that period I also went to Semir Zeki's lab at University College London for my thesis project. I was drawn to this lab because I had read a lot of Zeki's early research on visual perception and he had just initiated a project on neuroscience and the experience of art. My thesis is based on a study done together with Fiammetta Ghedini, a PhD student who also did a residency in the same lab.

What was your thesis about? What was your main finding/conclusion?

My thesis project was an fMRI study about the perception of bistable figures like the Necker cube and the Rubin vase. These figures can be experienced in two different ways. When you look at these bistable figures they spontaneously change back and forth between two different percepts.

The first research question was to find out which brain areas are specifically involved in bistable perception. We compared the perception of spontaneously reversing figures with replay sequences of stable figures that physically changed in front of the participant. The perceptual alternations during the bistable condition were due to changes driven by the viewer, while alternations during replay depended on changes of the visual stimuli. Our results showed that there is not just one area involved in bistable perception, we found rather symmetrical activation in both sides of the brain. We were quite surprised to find activation in both hemispheres. There have been other brain imaging studies of bistable perception, but most researchers only found activity on the right side of the brain. We mainly found activation in the frontal and parietal cortex, in areas that are also involved in selective attention.

We were also curious whether different processes are involved when you look at different types of bistable figures. Geometric figures like the Necker cube are different compared to figures like the Rubin vase; the cube always remains a cube, while a vase belongs to a different image category than the two faces. Therefore we included two types of bistable figures in our experiment. We had geometrical "within-category" figures like the Necker cube, which switch perspective but remain the same object. We also had "between-category" figures in which two different image categories could be seen; faces and bodies. We expected that the between-category figures would engage areas related to face and body perception, while the within-category figures would be associated with activity in a brain area typically involved in seeing objects. Areas related to face perception and surrounding regions in the ventral cortex were associated with perception of between-category figures as predicted. When we looked at the within-category figures, something surprising happened. We did not find activation in an area related to object recognition but rather in the parietal lobe, in a region that has also been associated with mental rotation. It seems like we continuously re-categorize the between-category figures using functionally specialized areas related to object recognition, while the geometrical within-category figures are processed more as a spatial task involving different perspectives.



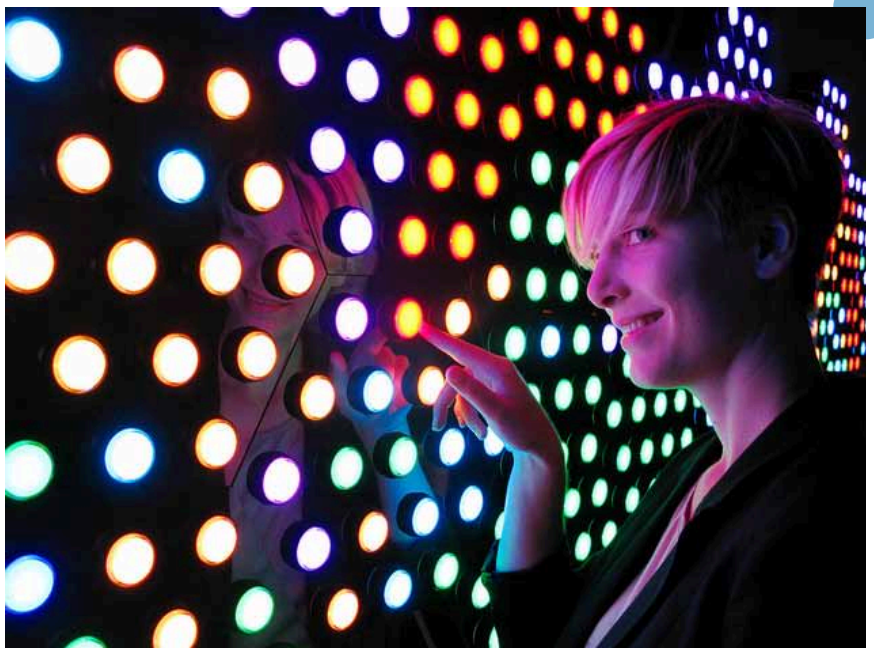
Necker cube

Rubin vase

Why do you think your thesis stood out form the others? What made you win the award?

A lot of work went in to the stimuli and design. Bistable perception has already been researched extensively, but this study had some new features. First of all we had the replay condition, which made it possible to compare the difference between internally and externally driven changes in perception. This was also

›› CONTINUATION INTERVIEW WITH BARBARA NORDHJEM



the first imaging study where two different categories of bistable figures were compared. Another feature was that we used a lot of different bistable figures where most other researchers just included a few well-known examples.

The topic also gave me the opportunity to speculate about some more philosophical issues like awareness. One of the reasons I am so fascinated with bistable perception is that these illusions show that seeing is far more than just the direct experience of visual input being projected in the brain. Seeing is also the process of making sense of the world.

What are your research interests now?

I am now in the Visual Neuroscience group within the department of Ophthalmology. I am still very interested in the processes involved in visual experiences. My PhD project is about different ways of seeing our surroundings and the neural mechanisms involved. There is the classic two-stream hypothesis about the dorsal "where" and the ventral "what" stream for visual information in the brain, but this is still a very broad distinction. I am curious about the possibility of several distinct sub-streams within the ventral stream. My lab is known for their studies with eye-tracking so I am also interested in how movement of the eyes is related to different visual experiences and processes in the brain.

■ FLORIAN SENSE

Introducing new editors

› Anna Katharina (Kathi) Müller

I moved from Germany to Groningen to study Psychology in 2007. From the early beginnings of my academic career, I realized that I am most fascinated by topics like perception and cognition and their mutual interplay with behavior. My bachelor thesis focused on the cognitive functioning in adults diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) while my minor courses centered on neuropsychological or psychiatric phenomena. Working with patient groups and using the obtained knowledge in order to improve treatment or to support the patient and their environment in everyday life situations is definitely one of my major interests. However, during a summer school at the University of California in Los Angeles, I also enhanced my knowledge in more basic neuroscientific and neurobiological questions. After finishing my master degree in Clinical and Developmental Neuropsychology I started my PhD at the same department here in Groningen. My PhD project aims to enhance the understanding of the reciprocity of social and perceptual/attentional processes in neurotypicals and patients with autism. By this, my supervisors (Dr. C. Falter and Prof. dr. O.Tucha) and I hope to shed light on the question of whether social perception differs from non-social perception (perception of non-animated objects) and whether patients with autism actually differ from neurotypicals on the basis of how they perceive social information.

INTERVIEW WITH PROF. DR. GERT TER HORST

Why we won't like orange and ginger yoghurt forever

COLLABORATION BETWEEN THE NEUROIMAGING CENTER (GRONINGEN) AND THE TOP INSTITUTE FOR FOOD AND NUTRITION (WAGENINGEN)

Prof. G.J. (Gert) ter Horst is the director of the BCN Neuroimaging Center at the UMCG in Groningen. In this interfacultary institution the human brain is studied in vivo. Prof. Ter Horst specializes in the neurobiology of psychiatric disorders, and is also interested in neuroscience and neuroimaging in general. His research focuses on the gender differences and molecular neurobiological effects of chronic stress exposure. Recently, he started collaborating with Wageningen University on a project focusing on the long term appreciation of food products developed for elderly and cancer patients. This research is supported by industrial partners and the Top Institute for Food and Nutrition in Wageningen. At first glance, this seems an unlikely choice; therefore I will ask Prof. Ter Horst some questions about this project and the partnership.

First of all, thank you for the opportunity to interview you. I would like to talk about your collaboration with TI Food and Nutrition (TIFN) in Wageningen. Why did you start to work together?

The University Medical Center of Groningen (UMCG) and the University of Groningen are partners with the Top Institute for Food and Nutrition. Since I am director of the NIC, I was invited to be a project leader for the project on sensory systems and food intake. I was invited for several lectures and meetings to discuss the new programme they initiated. We had the opportunity to submit proposals for joint projects between the participating universities and industrial partners, and from these our proposal was selected. I am working together with Kees de Graaf who is a Professor in psychology at Wageningen University. He has a lot of experience in the psychological testing of food products. We came up with an idea, which was initiated by the participating companies Danone and Friesland Campina, to find out more about the neurobiological aspects behind food choice, and why people choose certain foods for a long time. I was already working on a project for the province Groningen. We were studying the effects of medications on brain activity to come up with a model that predicts which drugs would be safe for psychiatric patients, for example to prevent unwanted cognitive effects. The research plan of this project in Groningen was also used for the TIFN study.

What is the main aim of the project?

The main aim of the project is to identify food products that are liked by people for a long time. The idea is to reduce product introduction failures on the market. I will give you an example. The dairy industry has put a new product on the market, orange and ginger yoghurt for example. This product was popular for a couple of months and then people were not buying it anymore. We want to introduce new test batteries, including neuroimaging and psychological tests, that can show us how novel products are evaluated by the brain when small taste samples are tested by volunteers. We want to know how the pattern of brain activity of appreciation changes after repeated exposure because this could indicate whether a product is a candidate for long term liking (and buying). This could become an interesting marketing tool for the participating industrial partners. We only need approximately twenty people to predict if a new product will be liked for a long time or not. It is not only important for the industry, but also for elderly and cancer patients. We are including cancer patients as well, because cancer patients undergoing chemotherapy experience a change in taste sensation. If your taste sensation changes, your appreciation of food products will change too. Many patients experience that products taste like fish or metals or something like that. Obviously, it is not nice to have a metallic taste in your coffee for example. Such taste changes occur with products that are very good at helping

›› CONTINUATION INTERVIEW WITH PROF. DR. GERT TER HORST

these patients maintain weight during chemotherapy. Danone has developed a series of products (Oral Nutritional Support – ONS) that have concentrated amounts of calories or protein to help these cancer patients and the elderly to maintain body weight. If such a product is not appreciated because of the metallic taste, patients will not eat it, which is not good for their well-being. In that respect, we also want to come up with some basic ideas about how chemotherapy changes taste perception. The same thing is true for the elderly. Part of the project will focus on the elderly, because when people grow older their taste changes. For food companies, it is of importance to know how this changes, because then they can predict what people will like when they are older. Older people also suffer more from neophobia: the fear of new products. Men probably have that even more than women do, and we want to discover these kinds of things. Researchers used to do such investigations with huge psychological testing batteries, with hundreds of people visiting a facility to taste the products and evaluate them on paper. That is more or less a subjective analysis of how products are appreciated, but if we could provide 'hard' neuroimaging information about changes in taste perception it would have added value for the companies.

How do you think you can change the appreciation of food in the end? Would you like to change the food products or the people?

We do not want to change the people, because that is fixed. We cannot change that. It is a fact that your taste changes as you become older, as well as that taste perception changes during chemotherapy. We could look for other drugs or different types of chemotherapy, but in any way the chemotherapy itself destroys dividing cells to suppress tumors. During such therapy, the dividing taste cells in the tongue are affected too, resulting in a different taste perception. We simply cannot change that. If we want to change anything, we have to change the food. One of the things that could come up, for example, is that the salt preference of cancer patients undergoing chemotherapy changes gradually. It could be that at the beginning of the therapy, patients need products that are not that salty and during treatment, the salt content has to be increased. Maybe the product is then still appreciated in the same way. This is separate from the metallic taste, because nobody knows where that comes from.

Where does your interest in food and taste originate from?

I do not have a specific preference for taste research, but during my PhD I was working on how the brain controls the secretion of insulin in the pancreas in the context of obesity. Thus, thirty years ago I was actually working in this field. Later on I gradually moved to other fields, but now at the end of my career, I have come back to the field of obesity and food.

Why do you believe this project is important?

First of all, there is a lot of money involved. The collaboration between two universities and two major food companies is really important within the context of current research funding, since we have more money for the validation of our research together. This project is important for the food industry, because thus far they have not used any imaging facilities. Imaging research about food intake has been performed, but mainly by basic researchers, not by companies. It is novel and important for food companies to start using neuroimaging to increase the quality of their products. The cooperation between the Universities of Groningen and Wageningen is also important, because within the spectrum of Dutch universities, there are collaborations between

Prof. Gert ter Horst with an fMRI compatible device to feed people in the fMRI scanner. Luca Nanetti developed this device for his work characterizing the neuronal circuitry underlying appreciation of food products in healthy volunteers at the Neuroimaging Center in Groningen.

›› CONTINUATION INTERVIEW WITH PROF. DR. GERT TER HORST

› *The collaboration between two universities and two major food companies is really important.*

different universities and there is competition between these groups of collaborating universities. For Groningen, the likely candidates are the Universities of Wageningen, Nijmegen and Twente, because other universities already have other consortia. There is already an advanced collaboration with Twente which is the most nearby and the TIFN project is an important basis for the collaboration between Groningen and Wageningen. Altogether, partnerships with universities and companies are very essential. Also, this project is important for our basic understanding of how taste perception can change. Furthermore, the project has a clear societal goal in the end which is to improve food products, especially for elderly and cancer patients.

How many people are working on this project?

We started in April 2011 with six PhD students and four post-docs. Right now, the total team consists of 18 to 20 people in Groningen and Wageningen together. I am the project leader, so the entire project is my responsibility, including what happens in Wageningen. Moreover, I have to take care of communication with the industry, which is quite different from communication at universities.

What did you find so far?

Not much yet. We are currently in the stage where we have set up a couple of experiments. For example, Luca Nanetti (NIC) is running a scan session using healthy volunteers to characterize the neuronal circuitry underlying the appreciation of dairy products and ONS in which he hopes to predict long term liking. In Wageningen they are running another fMRI experiment in healthy volunteers and a study on the Restaurant of the Future, involving 220 participants, which uses psychological tests to relate emotions and food. That study was completed, but I have no data yet. The study with cancer patients in Groningen has a pending METc application, this always takes a lot of time, but we hope to start with this large patient study in March. This project will involve about fifty testicular cancer patients scheduled for chemotherapy and about a hundred patients that have completed the chemotherapy. The latter group we will follow up to seven years after the start of the chemotherapy. The patients will participate in questionnaire studies but also in tasting experiments, which we hope to use to identify a shift in food preferences. In a parallel study, we will characterize the chemotherapy-induced changes for the taste-related patterns of neuronal activity.

Is the distance between Wageningen and Groningen a problem?

The distance is some sort of a problem. It is not that easy to have interaction between Groningen and Wageningen. Of course we make use of Skype, the phone and e-mail, but still it is not easy to communicate. Another thing that complicates matters are differences in personality. The team in Groningen was mainly classified as being extrovert while the team in Wageningen is largely composed of introvert personality types, as we have learned from an assessment (MBTI) during team training. This was predicted to complicate the communication between the Wageningen and Groningen teams. As a project leader I have to keep this in mind when we organize joint sessions or when we expect to get unrequested feedback on the progress in Wageningen. It is nice that we know about these personality type differences. I was never enthusiastic about such personality tests, but now I have learned that indeed it can be an important tool for understanding interactions within larger teams. Maybe it is a good idea to introduce the MBTI test for BCN PhD students to facilitate the communication between supervisor and student.

Do you still need PhD candidates or master students for this project?

Yes, we need at least one more PhD student for the elderly project here in Groningen. We think the new candidate could be one of the BCN master students. As far as I can say now, I think it will be a project of 3,5 years, but maybe we can find some additional funding for another half year. Of course, master students are welcome to join the project as well.

How long is the project going to last?

The project basically lasts four years, but probably it will be extended by one year. It may end in January 2016, because in 2015 most of the PhD students will complete their projects. Additionally, TIFN is well represented in the new "Food and Agriculture" strategies of the government, so we foresee that the project will continue after 2016.

DAFNE PIERSMA

Center for Medical Imaging North East Netherlands (CMINEN)

The Innovative Medical Devices Initiative NL (IMDI.nl) aims to ensure the availability of a new generation of (medical) technical instruments that will allow the healthcare system in the Netherlands to meet the qualitative and quantitative demands of an ageing population while remaining affordable. This initiative of the Netherlands Organisation for Scientific Research (NWO), in collaboration with the Association of Universities in the Netherlands (VSNU), was launched on November 18th, 2010. The IMDI.nl initiative currently includes eight Centres of Research Excellence (CoREs).

The Center for Medical Imaging North East Netherlands (CMINEN) is one of the eight CoREs of IMDI.nl acknowledged by NWO and the Netherlands Organisation for Health Research and Development (ZonMW). Founding fathers of CMINEN are the University of Groningen (RUG), University Medical Center Groningen (UMCG), University of Twente (UT) and Siemens. In addition, CMINEN has close collaboration with 35 SME's in the field of medical imaging. The aim of CMINEN is to accelerate innovative research and development in non- to minimally invasive medical imaging in the fields of neurodegenerative and cardiovascular diseases, and oncology (breast, lung and prostate cancer).

On November 9th, 2011, CMINEN celebrated its official countrywide launch with an inspiring symposium in the UMCG in Groningen. Next to the top researchers and business partners active within CMINEN, representatives of the regional and Dutch Government (VWS and EL&I), the funding bodies (ZonMW and NWO), the health insurances (Menzis), the other CoREs, and board members of Siemens and founding universities were present. Presentations were given by ing. K. Smaling (director Healthcare Siemens NL), A.F. van der Touw (CEO Siemens NL), C. Oudshoor (VNO-NCW), H.J. Smid (director ZonMw) and Mr. R.H.L.M. van Boxtel (CEO Menzis). The speakers agreed on the high potential of CMINEN in conducting groundbreaking research, acceleration innovation and in the containment of healthcare costs through the critical evaluation of new imaging technologies.

At the end of the meeting, Dr A.H. Flierman (president University of Twente), Prof. F. Kuipers (Board of Directors, UMCG) and A.F. van der Touw (CEO Siemens NL) signed the official agreement and the CMINEN foundation was officially launched. In 2012 and in accordance with the business plan, the CMINEN research programme and research projects, as well as the governance structure, will be set up.

■ ERIK JIPPES

DTI - DIFFUSION TENSOR IMAGING TECHNIQUES IN MAGNETIC RESONANCE IMAGING?

Diffusion in the white matter of the human brain

Diffusion weighted imaging (DWI) is a MR technique based on measurements of the translational random motion effects of water molecules. This process is affected by the tissue microstructure, hence the obtained image intensity is an indirect measure of the tissue microstructure. Diffusion tensor imaging (DTI) estimates the preferred diffusion direction of water molecules in each image voxel[1]. By performing diffusion tensor tractography (DTT), i.e. connecting the preferred diffusion directions in adjacent image voxels, a 3D map of the reconstructed cerebral nerve system can be obtained[1,2,3].

Clinical diffusion measurements in magnetic resonance imaging (MRI) were introduced in the 1980's when Le Bihan et. al. found differences in a diffusion parameter between normal and pathological tissues[4]. The application of diffusion measurements began in 1990 when Moseley et. al. depicted an ischemic lesion in a cat brain within hours from the ischemic attack, which was earlier than when the lesion would have been detected using conventional techniques in medical imaging. The concept of tractography was introduced as magnetic resonance diffusion tensor imaging (MR-DTI) by Basser et. al. in 1994[5].

The white matter (WM) of the human brain contains nerve fibres, composed as bundles of axons. Each axon is covered by a cylindrical myelin sheath that restricts the diffusion. The diffusivity perpendicular to nerve fibres is thereby severely reduced as compared to the diffusivity parallel to nerve fibres[6]. The WM can be sub-divided into different pathways, based on anatomical and functional criteria[3,7]. The nerve fibres in these WM pathways connect different regions in the brain to each other. By limiting the voxels included in a DTT analysis, it is possible to extract an indirect representation of individual WM pathways as reconstructed bundles of streamlines, and visualise them according to figure 11,2. The reconstruction can be colour-coded according to diffusion directions. In figure 1, green pixels correspond to preferred diffusion in the anterior posterior direction, blue pixels in the superior inferior direction and red pixels in the right left direction. The signal intensity of the pixel correlates with the grade of preferred diffusion direction.

DTI is increasingly used as a powerful tool in many cerebral and neurological diseases to assess the early loss of microstructural integrity of WM pathways and pathway-specific abnormalities[8]. A future possibility is to use the technique as a biomarker for diagnosis and for treatment response.

Initially, a developed method for assessing differences in DTI parameters in specific regions of WM pathways between groups of subjects/patients will be implemented. A profile of each WM pathway will be obtained, depicting the spatial variation of DTI parameters as functions of position. The profiles allow for localisation of regions where DTI parameters differ between groups as well as of asymmetries between the left and right side of the brain. A tool for analysis and visualization of WM pathways affected by the combination of WM chronic ischemia and degenerative dementia will also be developed. Quantitative evaluation of DTI and DTT can be performed in different ways and it is desirable to

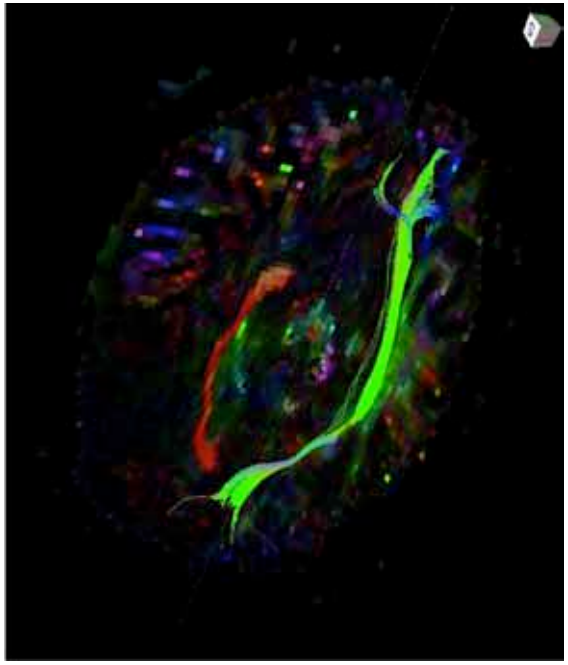


Figure 1.
The WM pathway, denoted inferior fronto occipital fasciculus (IFO), has been reconstructed by tractography and visualised together with the corresponding map showing color-coded values of a DTI parameter. The tractography and visualisation has been done using TrackVis4.

Research Network
Ageing Brain

U4 PhD Research Network 'Ageing Brain'
Within the joint U4 Research Network 'Ageing Brain' (a strategic collaboration between Ghent University, University of Göttingen, University of Groningen and Uppsala University) two joint Groningen-Uppsala PhD projects have been established. The aim of these two projects is to establish standardized and reproducible analysis methods for DTI of the human brain.

establish standardized evaluation methods that can be reproduced in different centres and using different MR scanners. Similar DTI scan protocols will be set up at MR scanners in Uppsala and Groningen respectively. Healthy individuals in different age groups will be scanned by MRI and analysed with regard to DTI metrics. The analysis methods that have been set up in the project will then be applied and validated for the evaluation of specific WM pathways and brain tissue regions affected in neurodegenerative disorders. Validation of the analysis methods will be performed on patient groups from Uppsala and Groningen.

JOHANNA MARTENSSON

Participants kick-off meeting of the joint U4 research programme 'Ageing Brain' of the Research Network 'Ageing Brain' Saturday October 22nd, 2011

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3. Mori S. ISBN:0444517413, Elsevier Science, 2005
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Introducing new editors

› Kim A. Gargar

I came to biology from physics. My physics masters thesis at the University of the Philippines is on a symmetric model of spherical star formations to which I applied numerical and analytical techniques to further our study. I've always been fascinated by chaos theory and its cross disciplinary implications and, in fact, applied them to astrophysics modeling work. I've been teaching college physics already since 2000 until I met Dr. Ed Mendoza (Munich) in a Manila-wide research collaboration. He is also involved in EUCLOCK, which my current supervisor Domien Beersma (CBN) is also part of. That's how I got into my current project. Since January 2009, we have been trying to understand the mammalian circadian pacemaker using mathematical and computational modeling.

INTERVIEW WITH FRANS CORNELISSEN

We continue with our tour to eye-tracking labs!

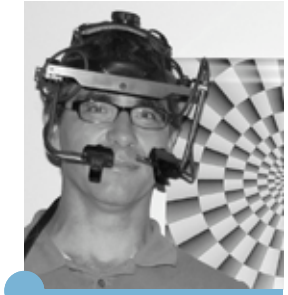
Frans Cornelissen is an Associate Professor at the Department of Ophthalmology and studies the visual system using behavioural and neuro-imaging techniques. I interviewed him to get to know more about how eye tracking is used in his lab to understand how the visual system works in participants with healthy and impaired vision. As he puts it: "eye movements are an integral and crucial part of human viewing behaviour. You cannot really understand vision without also looking at eye movements".

Cornelissen studied biology at the University of Utrecht and then pursued a PhD at the University of Groningen. After his PhD, he had several post-doc positions: one at Syracuse University in upstate New York, and two in Groningen, one of which involved a collaboration with the University of Freiburg. He has been working on multiple projects, many of which involved eye tracking in some way and which often required him to develop new methodologies to answer his research questions. One of his lab's tools has become quite popular over the years: their Eyelink Toolbox for Matlab is used by a large number of other labs for developing eye-movement experiments.

One of the first applications of eye tracking equipment that Cornelissen developed was a real-time simulation of the effects of impaired vision in healthy subjects. He studied visual search behaviour in low-vision participants suffering from tunnel vision or macular degeneration, and developed an application that simulated these same effects. Healthy participants could then inspect stimuli and by using eye tracking, the picture was dynamically adapted in real time depending on where they were looking. This way he could study the influence of various degrees of visual field defects on visusearch performance in a controlled way. Moreover, relatives of people suffering from tunnel vision and similar impairments could get a good idea of what their relatives were suffering from.

Another, rather related, application involved people suffering from hemianopia (blindness in half of the visual field). Together with Mark Tant, a former PhD

›› CONTINUATION INTERVIEW WITH FRANS CORNELISSEN



› You cannot really understand vision without also looking at eye movements.

student of Wiebo Brouwer at the Department of Neuropsychology, Cornelissen developed a training programme that helped people compensate for their hemianopia using eye-movements. Such patients often fail to move their head and/or eyes so they can scan their blind visual field that impoverishes their representation of the world around them and might lead to potentially dangerous situations (in traffic, for example). If they are blind on the left side, for example, the best compensatory technique is to make a saccade to the far left and then gradually work their way back to the right. This is not a very natural thing to do, however. The training worked reasonably well, to the extent that some of the patients could afterwards even be classified as "save drivers" in a driving simulation study. In Cornelissen and Tant's studies, simulations were used for gaining more in-depth understanding of the viewing behaviour of the hemianopic participants. For example, they found that both patients and healthy participants with simulations turned their heads in a characteristic manner that, counter-intuitively, did not help the compensation at all.

During his stay as a post-doc at Syracuse University, Cornelissen did not use eye tracking but came in touch with functional magnetic resonance imaging (fMRI), then still a brand new technology. Back in Groningen, he was involved in a project together with the University of Freiburg in which they combined eye tracking and fMRI. They pioneered the use of a technique, now known as event-related fMRI, in combination with eye movement recordings, to study the Frontal Eye Fields and could assign them a role in the suppression of reflexive eye-movement behavior.

Jan Bernard Marsman, a former PhD student of Cornelissen, and now a post-doc at the BCN Neuro-imaging Center, continued the development of methods to incorporate eye-movement behaviour in fMRI paradigms. One important reason for wanting to pursue this is that in a standard fMRI paradigm, the sequence of stimuli are predetermined and data analysis is done in reference to those predetermined trigger events (such as, for example, the appearance of a new picture on the screen). However, in normal, free viewing, eye movements like saccades can basically be made at any time, and their timing is largely under the control of the participant. Marsman showed that the use of these internally generated triggers can be a critical aspect in the analysis of scene viewing behaviour. He could demonstrate the involvement of a number of brain areas (such as the temporal parietal junction and motion area MT) only when he used participants' individual viewing behaviour in his analyses.

One rather tricky part about this type of analysis is to bridge the gap between the relatively slow fMRI scans (approximately one picture every 1.5 seconds) and the relatively fast succession of eye movements (on the order to 2 to 4 per second). Hence, a major part of Marsman's thesis was devoted to showing that this can actually be done.

As part of this line of work, Cornelissen and his colleagues tested an attentional theory of visual processing that, based on behavioural eye tracking work, had suggested that we inspect pictures and scenes in two different "viewing" modes, dubbed "ambient" and "focal" viewing. As part of a European consortium, they set out to identify the underlying neural correlates by combining eye tracking and fMRI. Initially, they expected ambient viewing to be associated with activity in the dorsal stream, and focal viewing to be associated with activity in the ventral stream of the visual system. Surprisingly, however, they found evidence that suggested these two modes of viewing are associated with activity in two sub-streams within the ventral stream (with ambient viewing more associated with medial and focal viewing more with lateral activity in the ventral stream). A new PhD project has just been launched to investigate this new duality in more detail. The PhD student tackling this task is Barbara Nordhjem (see this issue for an interview with Barbara).

■ FLORIAN SENSE

› BCN RESEARCH MASTER

My way to BCN - From Psychology to the C-Track

I'm from the beautiful "Ruhrgebiet" in Germany and and I am already living in Groningen for quite a bit, almost 4 years to be precise. Before I started with the C-Track of the BCN master's, I did my bachelor in Psychology. When I started studying psychology I didn't know a lot about the possibilities my studies would provide. Everybody knows a little about Freud or Skinner, but that was about it. In the second year we had a course called Biopsychology which opened my interest for the field the first time and fascinated me. So by the time we could specialize into the direction of our choice, I decided to go for neuroscience.

In the last year of the bachelor I didn't really know which direction I wanted to go with my master. Choosing the right master's programme turned out to be a really difficult issue. There are so many choices: one year masters, two year masters, research or applied, very specific or rather broad topic... etc. Time was limited as the Master's application deadlines are mostly in spring and we had our last exams during that period and were busy with our bachelor thesis as well. So I applied for a few programmes I thought sounded interesting and then waited for approvals or rejections. I got several offers in the end and then had to decide which fit me the best.

I was happy that I was accepted for the C-track of BCN master's, and even though I was tempted to go to another country for the master's I decided for this programme because it fit my interests best. I wanted to learn how to use all those neuroimaging techniques and how to do proper research. Further I liked the idea of the interdisciplinary approach and I thought I would learn a lot about the whole field of neuroscience and broaden my scientific horizon.

Now that I'm in the middle of the programme I have to say that it was definitely the right choice and the BCN master's is actually exceeding my expectations. I like the atmosphere; we are only 14 students in my track and we are a nice bunch of people. (Though it was a strange feeling at first coming from bachelor of hundreds of people into such a small group). Also you have a lot of freedom to go into the direction of your choice and you are actually supported to do so. It's also very interesting to learn about research from the other tracks. I'm already looking forward to the second year where we will get the possibility to take courses of the other tracks as well. I also hope to go abroad next year to gain some more international experience.

I just joined the team of the BCN newsletter, I think this will be a nice way to get to know even more people and the research of the BCN community.

RICCARDA PETERS

BCN.tv: Broadcasting Channel for Neuroscience?

Over the past two months, four BCN groups contributed to several science programmes on national public television. Here they describe their experiences in dealing with the editors and journalists, the preparations and the reactions they got.

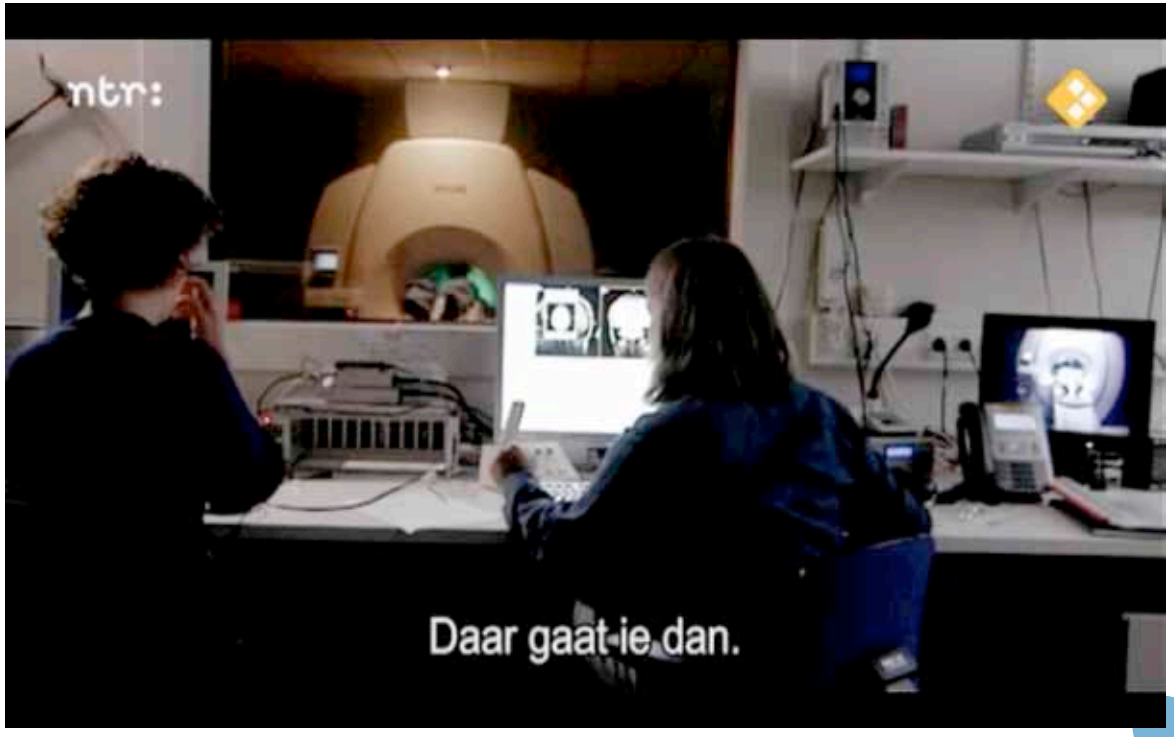
Three contributions were made for episodes of the television programme Pavlov. In this programme, made by the NTR (an independent Dutch broadcasting organisation which specializes in information, education and culture), a number of Dutch public figures ("Bekende Nederlanders") asked scientists questions about their specific talents or characteristics. Three BCN teams were involved in answering these questions. Finally, a (now former) BCN member contributed to an episode of the BBC programme Focus, which looked at human emotions and how these have been studied in the past century. This programme was recently aired by the NTR on Dutch television.

Bert Otten, from the department of Movement Sciences, was involved in the Pavlov episode about top speed skater Ireen Wüst: "Since I had already helped to make a part of the same series in 2010 on the Olympic gymnast Epke Zonderland, the organizers contacted me again to see if I could do the analysis of her skating movements, which is one of the topics of our department's research. I did the item together with scientist Floor Hettinga. The contact with Ireen was primarily through her coach Gerard Kemkers. He was very careful in shielding her off until the right moment. This put a lot of pressure on the actual recordings and time schedule. The preparations to establish the actual scenes to be shot by the NTR team took a long time, since there was an interplay between what was possible in the time schedule and what we could measure with the new technology and software. In the end, the result was very satisfying from all sides, because we had a week of time between the actual recordings and the briefing of the results to Ireen and Gerard, allowing for careful analysis of the data. The time it took Floor and me was about 100 hours altogether, but we got further help from a number of master students (of which Dirk van der Meer was very important). We were very pleased with the results, but – as usual – felt that many details had been left out. There is of course always a conflict between making a TV programme that can easily be consumed by the audience and

›› CONTINUATION BCN.TV: BROADCASTING CHANNEL FOR NEUROSCIENCE?

scientific completeness. We received a huge number of reactions, both from the side of the speed skating world, and friends and colleagues. Having had experience now with the production of two programmes, I think I would do it again if the subjects were interesting enough. The link between science and society is crucial." Frans Cornelissen from the Laboratory of Experimental Ophthalmology contributed to the Pavlov episode about (blind) comedian Vincent Bijlo: "I was approached with the question whether I had experience with studying blind people and could tell more about the changes in the brain of someone who has been blind from birth". They had come across my name via a press release about our recent paper on cortical plasticity in patients with macular degeneration. While I had not studied completely blind patients before, I felt the topic was sufficiently close to my own field that it would allow me to give a bit of background about our regular work as well. I knew studies had shown visual cortex activation in blind participants reading Braille text, and therefore proposed this as the experiment. Remco Renken of the Neuro-Imaging Center prepared a simple paradigm, which we made sure was working prior to the actual day of filming. Somewhat to our relief, Vincent performed like the "typical" participant from the literature, and we could demonstrate a nice activation in his primary visual cortex during Braille reading. It made for a nice and simple message – Vincent's visual cortex has taken on a different role analyzing a different type of information – which the programme's editor was very happy with, obviously. And I must admit: one can read about it in the literature, but actually observing the "contradictio interminis" of a visual cortex being active in a completely blind person was something of a revelation to me as well. Would I do it again? Certainly, even though it costs a lot of time (including the film-shooting day, about 3 days total) it's revealing to think of the number of public lectures you'd have to give to reach the same audience. It runs in the thousands……".

André Aleman and Ruud Kortekaas contributed to the Pavlov episode about Mike Boddé. Mike is a musician and a comedian, but he has suffered from a severe depression in the past, and wanted to learn more about this in his Pavlov episode. Ruud recalls: "One of Mike's messages in his book "Pil" about his depression is that it is a disease like any other, that antidepressants are medicines just like any other, and that, consequently, there is no need to stigmatise depression or be shy about it. Mike initially spent quite some time talking with Willem Nolen about depression as a clinical entity. And of course, some footage of Mike going into an MRI scanner was a welcome visual addition. I positioned Mike in the scanner, but we did not perform an actual scan on him. Afterwards André explained the differences in brain activation between depressed patients and healthy controls. In total, we spent a few hours in the basement of the Neuroimaging Center. Both of us enjoyed talking with



›› CONTINUATION BCN.TV: BROADCASTING CHANNEL FOR NEUROSCIENCE?

Mike, who is really clever and fun to talk to. The film shoots were quite chaotic and hurried, but fortunately, this is not too obvious in episode. We both liked the result and would happily participate in such an activity again."

Finally, former BCN-member Christian Keysers participated in an episode of the NTR programme Focus, originally made by the BBC: "I was contacted by a senior editor of the BBC, who came to see a talk of mine at a conference on empathy. I first very much discouraged her from making an item on empathy for emotion. Since she persisted, I then negotiated a little bit of money to pay one of our graduate students to help make visual materials and run the experiment. It wasn't much, but it helped with the logistics. We then discussed what kind of experiments would be suitable for visualisation after the editor assured me that they really wanted to make the item. It took Harma Meffert about a week to prepare the experiment, and analyze the results, and it all worked out pretty well. It took two days of filming. I was very pleased with how the piece was cut, reflecting what we had agreed to convey as a message, and the BBC team was very professional and had researched the piece well. My policy is generally to say no to all movie requests, telling them how hard it is to make an experiment that truly works. This has filtered most television interest, leaving only some teams (Discovery Channel, BBC, VPRO) that seem to take the research very seriously and end up making meaningful programmes. I also always negotiate a little budget to fund a graduate student to prepare the experiments, analyze the data, and cover scanning cost. That helps with the logistics, and also filters out the shows that just want a 1-minute item that would end up costing you a week to prepare".

In conclusion, it seems all four teams were happy with the participation and end result. So, if ever asked, do consider participation, but make sure the programme is sufficiently serious about the science and make sure you can also tell your own story, however simplified the message will have to be.

■ FRANS CORNELISSEN

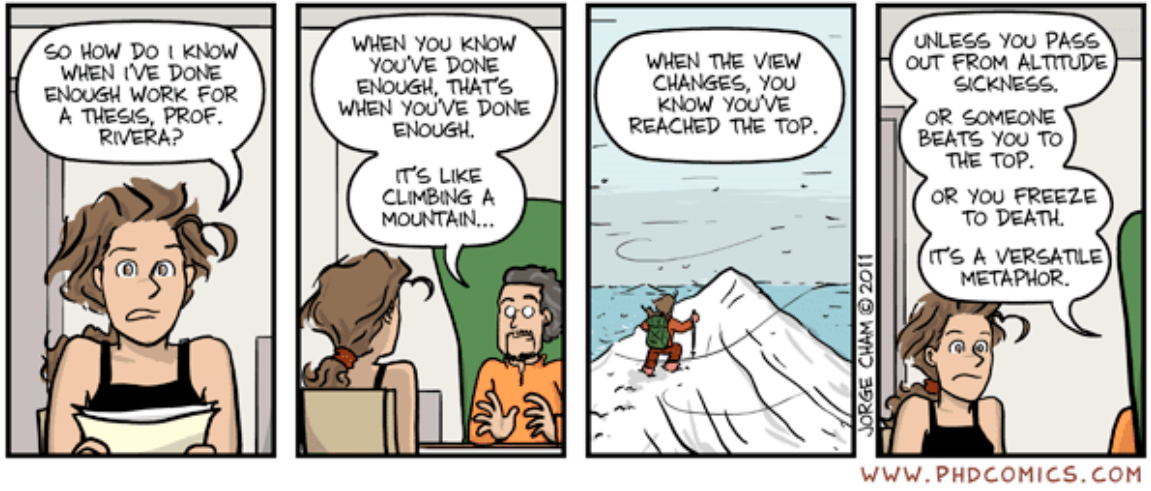
Links to the programmes mentioned here.

Ireen Wüst, Bert Otten, Floor Hettinga
http://www.uitzendinggemist.nl/afleveringen/1117012

Mike Boddé, André Aleman and Ruud Kortekaas
http://www.uitzendinggemist.nl/afleveringen/1119338

Vincent Bijlo, Frans Cornelissen, Jan Bernard Marsman, Anita Sibeijn-Kuiper
http://www.uitzendinggemist.nl/afleveringen/1213671

Focus, Christian Keysers, Harma Meffert
http://www.uitzendinggemist.nl/afleveringen/1235227
(Note that the episode of Focus is available for a short period following its airing only.)



› PROMOTIONS

Neural correlates of emotion processing in autism, schizophrenia and mental health

PROMOVENDUS
J.A.C.J. Bastiaansen
PROEFSCHRIFT
Neural correlates of emotion processing in autism, schizophrenia and mental health
PROMOTORES
Prof.dr. C. Keysers
Prof.dr. R.B. Minderaa

Nader inzicht in spiegelen emoties bij autisme en schizofrenie

Bij autisme zijn o.m. emotieherkenning en empathie verstoord. Het spiegelneuronensysteem is voor deze sociale processen van groot belang. Daarom werd eerder aangenomen dat autisme (grotendeels) wordt veroorzaakt door afwijkingen in dit spiegelneuronensysteem. Onderzoek van promovenda Jojanneke Bastiaansen laat zien dat dit onwaarschijnlijk is. Wel vond Bastiaansen aanwijzingen dat bij volwassenen met autisme de spiegelactiviteit in de loop der jaren toeneemt en dat dit samenhangt met een lichte verbetering in sociaal functioneren. Dit zou erop kunnen wijzen dat er bij autisme sprake is van een vertraagde ontwikkeling van het spiegelneuronensysteem. Wellicht kunnen op imitatie gerichte trainingen hier vroegtijdig op ingrijpen.
Mensen met schizofrenie kunnen soortgelijke beperkingen in hun sociaal gedrag hebben als mensen met autisme, zeker wanneer 'negatieve

symptomen', zoals emotionele vervlakking, meer op de voorgrond staan. Op basis van gedragskenmerken zijn deze groepen dan moeilijk van elkaar te onderscheiden, zo laat Bastiaansen zien. De onderliggende neurale profielen van autisme en schizofrenie lijken echter meer verschillen dan overeenkomsten te vertonen. Gecombineerde vervolgstudies naar deze twee stoornissen zijn nodig om de gevonden aanwijzingen over neurobiologische mechanismen die mogelijk ten grondslag liggen aan sociaal disfunctioneren in het algemeen, en aan autisme en schizofrenie in het bijzonder, verder uit te diepen.

Jojanneke Bastiaansen (Maastricht, 1983) studeerde cognitieve psychologie te Leiden. Ze verrichtte haar onderzoek in het Social Brain Lab van de Rijksuniversiteit Groningen en het Universitair Medisch Centrum Groningen (UMCG), binnen onderzoeksschool BCN en in samenwerking met Accare en GGZ Drenthe. Tijdens haar onderzoek was Bastiaansen verbonden aan het Autismeteam Noord-Nederland van Lentis. Het onderzoek werd mede gefinancierd door de NWO. Bastiaansen werkt inmiddels als onderzoeker bij het TRAILS-project van het UMCG. Zij promoveerde op 7 november 2011.

Robust and applicable handwriting biometrics

PROMOVENDUS
A.A. Brink
PROEFSCHRIFT
Robust and applicable handwriting biometrics
PROMOTOR
Prof.dr. L.R.B. Schomaker

Bij een rechtszaak kan correcte identificatie van de schrijver van bijvoorbeeld een handgeschreven dreigbrief of een mogelijk vervalste zelfmoordbrief erg belangrijk zijn. Handschriftbiometrie is een techniek om handschriftanalyses door een computer te laten doen. Axel Brink heeft een nieuwe computertechniek (Quill) ontwikkeld voor het verifiëren en identificeren van zowel moderne als Middeleeuwse handschriften.
Handschriftbiometrie is het toekennen van een schrijver aan een handgeschreven tekst door een computer kenmerken van het handschrift te laten analyseren. Handschriftbiometrie is zowel te gebruiken bij schrijververificatie als bij schrijveridentificatie. Een systeem voor schrijververificatie vergelijkt het handschrift in een document met dat in een ander document. Een systeem voor schrijveridentificatie zoekt in een collectie op basis van één tekst naar documenten met hetzelfde handschrift.
Axel Brink heeft een nieuwe techniek ontwikkeld voor handschriftbiometrie. Deze techniek, genaamd Quill, meet van elke pixel op de rand van een letter of cijfer wat de richting en breedte is van het inktspoor op dat punt.

›› CONTINUATION PROMOTIONS

Deze techniek geeft duizenden meetpunten op één pagina tekst. Al die meetpunten vormen samen het profiel van een handschrift. Dat profiel is te gebruiken bij schrijververificatie en -identificatie.

Quill werkt bij analyses van moderne en middeleeuwse handschriften net zo goed als de beste methoden voor handschriftbiometrie die Brink heeft onderzocht. Quill is samen met andere technieken opgenomen in GIWIS (Groningen Intelligent Writer Identification System), een programma dat men kan inzetten voor opsporingsonderzoek en geschiedenisonderzoek.

De promovendus onderzocht ook de robuustheid, op drie aspecten, van een aantal methoden voor handschriftbiometrie. Brink: 'Met robuust bedoel ik dat de techniek erin slaagt om de juiste schrijver te identificeren in een grote verzameling handschriften uit de praktijk. Een aantal bestaande technieken presteert prima op netjes overgeschreven teksten, maar dat zegt weinig over de prestaties onder realistische omstandigheden. In de praktijk zijn bijvoorbeeld vaak woorden doorgekrast, staan ze niet netjes op één lijn en vertoont het papier van middeleeuwse geschriften storende achtergrondverkleuring.'

Een belangrijk punt dat Brink onderzocht, is verdraaiing van een handschrift (tekens meer naar links of naar rechts laten hellen). Verdraaiing is een eenvoudige en veelgebruikte manier om een handschrift te vervalsen; want daardoor ziet een handschrift er direct anders uit. Met een computer kun je deze vorm van vervalsing tot op zekere hoogte terugdraaien.

Brink: 'Ik heb gekeken naar de herkenbaarheid van verdraaide handschriften en heb geconstateerd dat die na correctie slechter worden herkend dan de 'natuurlijke' handschriften. Computers kunnen het effect van verdraaiing blijkbaar maar gedeeltelijk ongedaan maken.' Dat komt waarschijnlijk doordat mensen bij verdraaiing niet alleen de hellingshoek aanpassen, maar onbewust ook andere kenmerken van het handschrift veranderen. Wat handschriftverdraaiing betreft zijn dergelijke systemen dus nog niet robuust.

Uit Brinks robuustheidsonderzoek blijkt ten tweede dat er ongeveer honderd tekens nodig zijn voor een succesvolle schrijververificatie of -identificatie. Brink: 'Hoe meer tekens er beschikbaar zijn voor analyse, hoe preciezer we handschriften kunnen vergelijken. Het blijkt dat de resultaten niet heel veel verbeteren als er meer dan honderd tekens beschikbaar zijn. Minder dan honderd tekens geeft wél een minder goed resultaat.'
Ten derde blijkt uit Brinks robuustheids-onderzoek dat doorgestreepte woorden kunnen blijven staan in een tekst zonder dat ze de kwaliteit van een analyse aantasten.

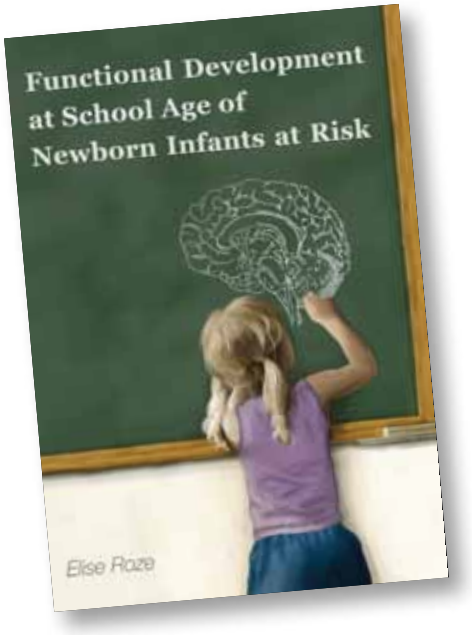
Axel Brink (Dalfsen, 1979) heeft informatica gestudeerd aan de RUG. Tevens behaalde hij daar zijn propedeuse in de communicatie- en informatiewetenschappen. In december 2005 begon Brink aan zijn promotieonderzoek bij het Institute of Artificial Intelligence and Cognitive Engineering (ALICE) van de RUG. Sinds januari 2010 werkt hij als kennisanalist bij Be Informed in Apeldoorn. Hij promoveerde op 2 december 2011.

Functional development at school age of newborn infants at risk

PROMOVENDUS
E. Roze
PROEFSCHRIFT
Functional development at school age of newborn infants at risk
PROMOTOR
Prof.dr. A.F. Bos

Brandwerende stoffen verstoren ontwikkeling jonge kinderen
Brandwerende stoffen, die overal ter wereld in elektronica, kleding en meubels worden verwerkt, hebben een negatieve invloed op de ontwikkeling van jonge kinderen. Dat blijkt uit het promotieonderzoek van Elise Roze.
Nog voor de geboorte kunnen kinderen met brandwerende stoffen in aanraking komen. Wanneer de moeder aan de stoffen wordt blootgesteld, komen ze in haar lichaam terecht. Vervolgens bereiken de stoffen via de placenta het lichaam van het ongeboren kind. Ze hebben een negatieve invloed op onder meer fijne motoriek en aandacht bij kinderen in de schoolleeftijd, concludeert Roze.
Voorts stelt Roze vast dat in te vroeg geboren kinderen met een bepaalde hersenlaesie (een cerebraal veneus infarct) de ontwikkeling beter is dan tot nog toe werd aangenomen. In sommige ziekenhuizen wordt de behandeling soms gestopt wanneer zo'n infarct optreedt,

›› CONTINUATION PROMOTIONS



omdat het een zeer slechte prognose zou hebben. De conclusies uit het onderzoek van Roze maken betere behandelbeslissingen mogelijk.

Elise Roze (Kampen, 1985) studeert geneeskunde aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek aan de afdeling Neonatologie van het Beatrix Kinderziekenhuis, onderdeel van het Universitair Medisch Centrum Groningen (UMCG). Roze promoveert binnen het MD/PhD-traject van het UMCG, waarbinnen de opleiding Geneeskunde wordt gecombineerd met promotieonderzoek; binnenkort studeert ze af als arts. Zij promoveerde cum laude op 7 december 2011.

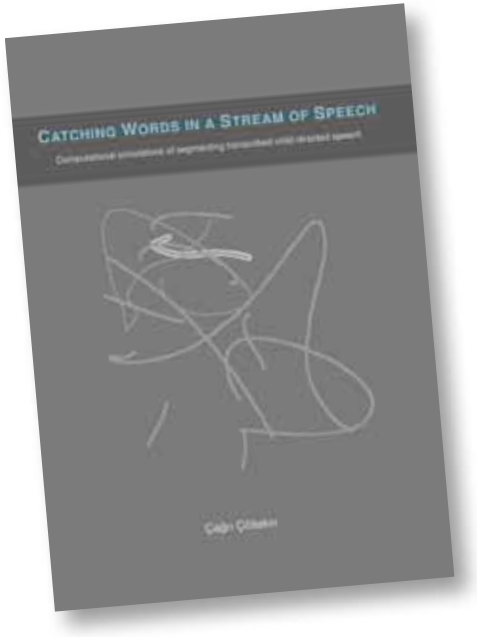
Catching words in a stream of speech. Computational simulations of segmenting transcribed child-directed speech

PROMOVENDUS
C. Çöltekin
PROEFSCHRIFT
Catching words in a stream of speech. Computational simulations of segmenting transcribed child-directed speech
PROMOTOR
Prof.dr.ir. J. Nerbonne

Onderzoek naar segmentatie van spraak met nieuwe modellen
De segmentatie van continue spraak in lexicale eenheden is een van de eerste vaardigheden die een kind moet leren gedurende de taalverwerving. Promovendus Çağrı Çöltekin onderzocht segmentatie met behulp van computationeel modelleren en computationele simulaties.

Segmentatie is moeilijker dan het op het eerste gezicht lijkt. Kinderen moeten woorden vinden in een continue stroom van spraak, zonder kennis van woorden te hebben. Gelukkig laten experimentele studies zien dat kinderen en volwassen een aantal aanwijzingen uit de invoer gebruiken, alsmede simpele strategieën die gebruik maken van deze aanwijzingen, om spraak te segmenteren. Nog interessanter is dat een aantal van deze aanwijzingen taal-onafhankelijk zijn, waardoor een taalverwerver continue input kan segmenteren voordat het een enkel woord kent.
De modellen die Çöltekin in zijn proefschrift voorstelt, verschillen op twee belangrijke vlakken van modellen uit de literatuur. Ten eerste gebruiken ze lokale strategieën, in tegenstelling tot globale optimalisatie, die gebruikmaken van aanwijzingen waarvan bekend is dat kinderen ze gebruiken, namelijk voorspelbaarheidsstatistieken, fonotactiek en lexicale beklemtoning. Ten tweede worden deze aanwijzingen gecombineerd met behulp van een expliciet aanwijzing-combinatie model, dat eenvoudig uitgebreid kan worden met meer aanwijzingen.

Deze modellen zijn getest met behulp van reële getranscribeerde kindgerichte spraak. De resultaten van de simulaties laten zien dat de prestaties van de individuele strategieën vergelijkbaar zijn met state-of-the-art computationele modellen voor segmentatie. Daarnaast levert het



combineren van individuele aanwijzingen een consistente verbetering in prestaties op. Het gecombineerde model presteert even goed als het state-of-the-art model dat als referentie gebruikt wordt, terwijl het alleen gebruik maakt van mechanismen die beter vergelijkbaar zijn met mechanismen die voorhanden zijn voor mensen die dezelfde taak verrichten.

Çağrı Çöltekin (Turkije, 1972) studeerde Cognitive Science aan de Middle East Technical University te Ankara. Hij verrichtte zijn onderzoek bij het Center for Language and Cognition Groningen van de RUG, waar hij werkt bij de afdeling alfa-informatica. Hij promoveerde op 8 december 2011.

›› CONTINUATION PROMOTIONS

Audiovisual processing in aphasic and non-brain-damaged listeners. The whole is more than the sum of its parts

PROMOVENDUS
D.A. Hessler
PROEFSCHRIFT
Audiovisual processing in aphasic and non-brain-damaged listeners. The whole is more than the sum of its parts
PROMOTOR
Prof.dr. Y.R.M. Bastiaanse

Afasie: bij kleinere klankverschillen grotere problemen
Mensen met afasie (een taalstoornis door hersenletsel) hebben moeite met het waarnemen van klankverschillen, waarbij de problemen toenemen, naarmate de verschillen

kleiner worden. De meeste problemen bestaan bij het herkennen van verschillen die door het wel dan niet trillen van de stembanden veroorzaakt worden. Dit blijkt uit onderzoek van promovenda Dörte Hessler. Mensen met afasie, maar ook mensen zonder hersenletsel, hebben veel profijt van het kunnen zien van de mondbewegingen van de spreker. Dit heeft invloed op de hersenreacties van luisteraars. Spraakverwerking is een taak die (meestal) zonder veel moeite gedaan wordt. Slechts als de verwerking verstoord is, bijvoorbeeld als gevolg van hersenletsel, merken we de complexiteit ervan op. Dörte Hessler deed onderzoek naar dit fenomeen. Niet alleen auditieve, maar ook audiovisuele verwerking van klanken komt aan bod.

Uit Hesslers onderzoek komt allereerst naar voren dat mensen met afasie (een taalstoornis die optreedt als gevolg van hersenletsel) meer moeite hebben met het herkennen van kleine dan van grote klankverschillen. Klanken kunnen bijvoorbeeld verschillen in de manier waarop de klank wordt gemaakt, de plaats waar dat gebeurt en het feit of de stembanden gaan trillen bij een klank. Klanken die op al deze drie onderdelen van elkaar verschillen blijken eenvoudiger te herkennen dan klanken die maar op één onderdeel verschillen. Het lastigste onderscheid is te maken bij klanken die alleen verschillen in het al of niet laten trillen van de stembanden (bijvoorbeeld het verschil tussen p of b). Hersenreacties van luisteraars zonder taalproblemen laten in het verlengde hiervan zien dat hersengolven een sterkere reactie vertonen wanneer de verschillen tussen klanken klein zijn. Dit hangt waarschijnlijk samen met de extra aandacht die nodig is om deze kleinere verschillen te verwerken.

Hesslers onderzoek wijst verder uit dat visuele ondersteuning (liplezen), die een positieve invloed heeft op de spraakverwerking, zich niet beperkt tot hele duidelijke herkenbare klankkenmerken, zoals de plaats van uitspraak, maar ook op de manier van uitspreken en de stembandtrilling. Ook personen zonder hersenbeschadiging tonen een effect van liplezen: hun reactietijden dalen als ze een doelklank moeten kiezen. Verder worden ook hun hersenreacties beïnvloed: auditieve en audiovisuele input leiden tot duidelijke verschillen in reactiepatronen. Verwerking is eenvoudiger bij een audiovisueel aanbod van een klank.

Dörte Hessler (Duitsland, 1981) studeerde Allgemeine Sprachwissenschaft aan de Universität Potsdam. Zij verrichtte haar promotieonderzoek bij de onderzoeksgroep Neurolinguïstiek, onderdeel van het onderzoeksinstituut Center for Language and Cognition Groningen, Faculteit der Letteren. Hessler werkt nu als docent bij de leerstoelgroep neurolinguïstiek. Haar hoofdtaak is de oprichting en coördinatie van het interfacultaire Expertisecentrum Taal- en Communicatiestoornissen (ETC). Zij promoveerde op 15 december 2011.

Self-regulation in sport and education. Important for sport expertise and academic achievement for elite youth athletes

PROMOVENDUS
L. Jonker
PROEFSCHRIFT
Self-regulation in sport and education. Important for sport expertise and academic achievement for elite youth athletes
PROMOTOR
Prof.dr. C. Visscher

Sportieve jongeren presteren beter op school
Jongeren die meer sporten – op wat voor niveau dan ook – presteren beter op school. Dat blijkt uit het promotieonderzoek van Laura Jonker. Door het sporten verbeteren jongeren hun vermogen tot zelfregulatie, oftewel: ze leren zelf hun doel te bepalen, zelf te beslissen wat er nodig is om dat doel te bereiken en in te schatten of ze al hard genoeg gewerkt hebben. Deze vaardigheden komen ook in de schoolbanken van pas.

Voor haar onderzoek nam Jonker vragenlijsten af bij drieduizend jongeren van 12 tot 18 jaar. Zij werden ingedeeld naar sportniveau (sporttalenten, regionale sporters, niet-sporters) en schoolniveau (havo, vwo, vmbo). Het onderzoek laat zien dat sporttalenten vaak een opleiding volgen op havo- of vwo-niveau en dat zij, ongeacht hun schoolniveau, vaker gebruik maken van zelfregulatie dan regionale sporters en niet-sporters. Los van het niveau waarop gesport wordt, lijkt sportdeelname bij te dragen aan de ontwikkeling van zelfregulatie.

›› CONTINUATION PROMOTIONS

Deze onderzoeksresultaten onderstrepen het belang van sport voor de ontwikkeling van zelfregulatie bij jongeren. Ook laat het onderzoek zien dat sporttalenten die meer reflecteren op hun sportactiviteit een grotere kans hebben om de top te halen. Daarmee biedt dit onderzoek trainers, coaches en docenten handvatten om leerlingen en sporters te begeleiden naar succes.

Laura Jonker (Bunnik, 1984) studeerde bewegingswetenschappen aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek binnen het Centrum voor Bewegingswetenschappen van het Universitair Medisch Centrum Groningen (UMCG). Het onderzoek werd mede gefinancierd door NOC*NSF. Jonker blijft werkzaam als onderzoeker in het UMCG; daarnaast werkt ze voor de KNVB aan een project om kinderen kennis te laten maken met verschillende takken van sport. Zij promoveerde op 21 december 2011.

Hows and whys of left and right. Ontogeny of lateralization and its functional relevance

PROMOVENDUS
S.M. Schaafsma
PROEFSCHRIFT
Hows and whys of left and right. Ontogeny of lateralization and its functional relevance
PROMOTOR
Prof.dr. A.G.G. Groothuis

Sara Schaafsma onderzocht bij de Papoea's waarom linkshandigheid na jaren evolutie nog steeds voorkomt bij mensen, ondanks dat de eigenschap gerelateerd is aan bepaalde gezondheidsproblemen. Ze concludeert dat de gangbare hypothese dat linkshandigheid blijft bestaan omdat deze voordeel oplevert bij een gevecht, onjuist is. Een goede gezondheidszorg lijkt een aannemelijker reden.

Linkshandige mensen komen voor in alle samenlevingen, maar ze zijn altijd in de minderheid. Bovendien is er een verband aangetoond tussen linkshandigheid en bepaalde ziekten. Sara Schaafsma vroeg zich daarom af waarom linkshandigheid na jaren evolutie nog steeds bij mensen voorkomt. De gevechtshypothese geeft hiervoor een mogelijke verklaring.

Volgens de gevechtshypothese bestaat linkshandigheid nog altijd omdat linkshandigen evolutionair voordeel hebben in samenlevingen waar vechten nog belangrijk is voor status en overleving. Doordat er meer rechtshandige dan linkshandige mensen zijn, weet de rechtshandige door gebrek aan ervaring niet goed hoe te vechten tegen een linkshandige. Zijn linkshandige opponent heeft dus de grootste kans om het gevecht te winnen.

Het winnen vermindert de kans om te overlijden als gevolg van het gevecht en levert status op, hetgeen al met al de kans op het krijgen van kinderen vergroot. Doordat rechts- en linkshandigheid gedeeltelijk genetisch is bepaald, blijft, volgens de gevechtshypothese, linkshandigheid in deze samenlevingen bestaan, ondanks het nadeel van de associatie met bepaalde ziekten.

Schaafsma onderzocht de gevechtshypothese in de niet-geïndustrialiseerde Eipo-gemeenschap, in de Indonesische provincie Papoea. Bij de Papoea's zijn nog geen goede voorbehoedsmiddelen en weinig moderne geneesmiddelen beschikbaar. Daardoor vormt deze samenleving een van de weinige waarbij dit soort onderzoek nog mogelijk is.

Schaafsma: 'Tot voor kort kwamen in de Eipo-gemeenschap veel man-tot-man gevechten voor door stammenoorlogen en onderlinge gevechten. Op basis van de gevechtstheorie verwachtten we dat er meer linkshandigen in deze gemeenschap zijn dan in een geïndustrialiseerde. Maar er waren er relatief juist mínder.' Volgens Schaafsma maakt het lagere percentage linkshandigen dan gemiddeld de gevechtstheorie als evolutionaire verklaring voor het voorkomen van linkshandigheid erg onwaarschijnlijk.

Volgens de promovendus lijkt een goede gezondheidszorg een waarschijnlijker reden voor het voortbestaan van linkshandigheid

›› CONTINUATION PROMOTIONS

bij mensen. Bij de Papoea's was tot voor kort geen moderne gezondheidszorg beschikbaar én minder linkshandigheid dan gemiddeld. Schaafsma vroeg zich af – mede door de relatie van linkshandigheid met gezondheidsproblemen - of een gebrek aan goede gezondheidszorg samen kon hangen met het lage aandeel linkshandigen in een samenleving.
Ze vergeleek daarom van twaalf Westerse landen het percentage linkshandigen met de publieke uitgaven aan gezondheidszorg. Omdat de gevechtshypothese ooit mede werd onderbouwd door aan te tonen dat er veel moorden plaatsvinden in een land met veel linkshandigen, nam ze ook het aantal moorden/doodslagen in elk land mee.

Schaafsma vond inderdaad een positieve relatie tussen het aantal linkshandigen in een land en de uitgaven aan de gezondheidszorg, maar geen relatie tussen het aantal linkshandigen en het aantal opzettelijk gedode mensen.

Schaafsma: 'Dit resultaat ondersteunt – ten koste van de gevechtshypothese – de hypothese dat een laag niveau van gezondheidszorg kan leiden tot weinig linkshandigen in een samenleving, zoals in de Eipo-gemeenschap. Het is echter nog onduidelijk welke rol gezondheidszorg precies speelt hierbij.'

Sara Schaafsma (Amsterdam, 1980) studeerde biologie aan de UvA. Sinds oktober 2006 deed ze promotieonderzoek bij het Centre for Behaviour and Neurosciences aan de RUG. Vanaf 1 februari 2012 werkt Schaafsma als post-doc op de afdeling Neuroscience & Behaviour van de Rockefeller University in New York. Zij promoveerde op 6 januari 2012.

The biocognitive spectrum. Biological cognition as variations on sensorimotor coordination

PROMOVENDUS
M. van Duijn
PROEFSCHRIFT
The biocognitive spectrum. Biological cognition as variations on sensorimotor coordination
PROMOTOR
Prof.dr. T.A.F. Kuipers

Zijn bacteriën cognitieve organismen?
Marc van Duijn ontwikkelt in zijn proefschrift een nieuwe theorie over biologische cognitie, oftewel biocognitie. In tegenstelling tot de meest gangbare theorieën die natuurlijke cognitie als een relatief recente evolutionaire ontwikkeling beschouwen, biedt Van Duijn een alternatieve verklaring voor biocognitie die gegrondvest is in sensorimotorcoördinatie; een vorm van adaptatie die evolutionair zeer oud is. Het onderzoek laat zien dat menselijke cognitie en bacteriële cognitie op hetzelfde mechanisme berusten, namelijk sensorimotorcoördinatie, dat door grote selectiedruk meerdere malen is geëvolueerd op verschillende niveaus van biologische organisatie.

Een centrale claim in Van Duijns dissertatie is dat de fylogenetische basis van biocognitie ligt in sensorimotorcoördinatie: het vermogen van organismen om zich voort te bewegen en zich te oriënteren in hun omgeving om zo de externe factoren voor hun metabolisme te optimaliseren. Bacteriële chemotaxis is een goed voorbeeld van minimale cognitie, de meest elementaire vorm van biocognitie. Chemotaxis helpt bacteriën zoals E. coli om een optimaal fysisch-chemisch milieu te vinden door met behulp van een moleculair geheugen

kleine concentratieverschillen van chemicaliën te detecteren en zich langs deze chemische gradiënten voort te bewegen. Een andere centrale claim van Van Duijn is dat het brede spectrum van biocognitieve mechanismen, van bacteriële taxis tot menselijke cognitie, het best kan worden begrepen als verschillende vormen van sensorimotorcoördinatie. Sensorimotorcoördinatie vormt de ontogenetische basis voor menselijke cognitie: objectherkenning, imitatie, taal, en zelfbewustzijn berusten in belangrijke mate op de ontwikkeling van verschillende vormen van sensorimotorcoördinatie. Bacteriële cognitie en menselijke cognitie zijn variaties op hetzelfde mechanisme dat door grote selectiedruk vele malen opnieuw is geëvolueerd op verschillende niveaus van biologische organisatie. Deze theorie over biocognitie vormt de basis van de groeiende consensus dat de kern van cognitie in sensorimotorcoördinatie ligt, en verankert de cognitiewetenschappen stevig in de biologie.

Marc van Duijn (Katwijk aan Zee, 1976) studeerde cognitieve psychologie aan de Universiteit van Leiden. Hij verrichtte zijn onderzoek bij de sectie theoretische filosofie, aan de Faculteit Wijsbegeerte van de Rijksuniversiteit Groningen. Hij promoveerde op 12 januari 2012.

Improving safety culture in health care. Implications of individual and institutional variability

PROMOVENDUS
T.A. Listyowardojo
PROEFSCHRIFT
Improving safety culture in health care. Implications of individual and institutional variability
PROMOTOR
Prof.dr. A. Johnson

Alle ziekenhuismedewerkers betrekken bij patiëntveiligheid
Tita Listyowardojo deed in een universitair medisch centrum onderzoek naar de organisatorische praktijken die van invloed zijn op patiëntveiligheid. Ze concludeert dat er nogal wat verschillen te bestaan tussen de verschillende beroepsgroepen. Artsen en niet-medisch medewerkers waren geneigd de risico's positiever in te schatten dan verpleegkundigen, klinisch medewerkers en laboranten.

Haar bevindingen maken duidelijk dat groepsspecifieke interventies deel zouden moeten uitmaken van iedere campagne om de organisatorische en veiligheidscultuur te verbeteren. Voor het implementeren van verbeterplannen voor patiëntveiligheid moeten daarom volgens Listyowardojo alle medewerkers van het ziekenhuis betrokken worden. Dus niet alleen de artsen, verpleegkundigen en technici die rechtstreeks contact hebben met patiënten, maar ook managers en laboranten.

Tita Listyowardojo (Indonesië, 1981) studeerde psychologie in Leiden en deed haar promotieonderzoek bij de afdeling Psychologie van de RUG. Na afronding van het onderzoek ging ze werken als Senior Consultant in Healthcare and Biorisk aan Det Norske Veritas (DNV) in Oslo, Noorwegen. Zij promoveerde op 19 januari 2012.

EVELYN KUIPER-DRENTH, OP BASIS VAN PERSBERICHTEN VAN DE RIJKSUNIVERSITEIT GRONINGEN

› PHD AND OTHER NEWS

BCN Retreat 2012

The BCN retreat will take place on March 15 & 16, 2012. 2nd and 4th years PhD students received an invitation to give a presentation. 1st and 3rd years PhD students are welcome to attend. If you would like to participate, please send an email to janine.wieringa@umcg.nl

BCN Symposium 2012

Please block Wednesday May 23 in your agenda for the BCN Symposium entitled: B,C & N of Communication. Check the BCN website; there you will find detailed information about the programme. Please apply for the Symposium by sending an email to janine.wieringa@umcg.nl

BCN Awards

Winner of the BCN Dissertation Award The winner of the BCN Dissertation Award 2010-2011 is Falak Sher. His dissertation entitled "Differentiation of neural stem cells into oligodendrocytes Epigenetic mechanism & potential applications in multiple sclerosis" was chosen as the best of the 11 nominations. The committee considered that, in addition to the winner, the theses of Roelina Hagewoud, Gretha Boersma and Sandra Bouwhuis were the best theses defended during Academic Year 2010-2011.

Winner of the BCN Summary Award Jan-Bernard Marsman is the winner of the BCN Summary Award 2010-2011. His summary was chosen as the best of the submitted summaries. The title of his dissertation is "Focus on fixations. Neuroimaging of human visual perception". All nominations are printed in the booklet "To the Point". Please contact me if you would like to receive a copy.

Winners of the BCN Poster Awards Martijn Wieling, Marjolein Bijlard and Linda Geerligs won the BCN Poster Awards. Their posters were selected as the best during the BCN Poster Afternoon.

Minutes of the BCN Education Committee The minutes of the BCN Education Committee will be made public on Nestor. You can login with your P-number. Below Relevant Courses you will find the BCN Training Programme. When you click on that link, you will find the button Education Committee. When you click on that button, you will find the minutes of the last meeting. Please contact me if you don't have access to Nestor.

Change in the BCN Buddy system

BCN recently introduced a Buddy System. The idea was that new PhD students would be connected to another PhD student who would be accessible for practical questions and would help establish social integration in the PhD community and their faculty.
Not every new PhD student wants a buddy, so the BCN education committee came up with the idea to start mentor groups as part of the buddy system. All new PhD students will receive an invitation to join a mentor group.
We are still looking for Buddies!! If you are in the 2nd, 3rd or 4th year of your project, and you would like to help first year colleagues, please sign up as a buddy. The form can be found on the BCN website (useful information - forms), or send me an email.

Finance of external courses and conferences

The system for applying for financial support of BCN for courses or conferences has changed. On the BCN website, you can find a new item: (useful information - forms). On this page, you will find application forms. Please use these forms! You do not have to contact me by email, just fill out the form in advance.
At this moment, the exact rules for finance are still not clear. I hope that I can inform you soon.
OV-chip card. If you travel with an OV chipcard, you are not given an actual ticket. An overview of your OV chipcard transactions will count as your travel receipt. If you have an anonymous (i.e. not in your own name), you can print an overview of the last 10 transactions at the transport company information desk or ticket vending machine. You can attach the print-out to your claim form. If you have a personal OV chipcard, you can print out a travel and transaction overview by using this web site: www.ov-chipkaart.nl. Please note that you first have to activate your account (also for the anonymous card).

DIANA KOOPMANS

› COLOPHON

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› COLUMN

Can you feel the rhythm?

Love is all around, and so is music. The universe is filled with the basic elements of music: rhythm, with the hours, days, months, seasons, years, the cycle of life; melodies, with the whisper of the leaves of a tree gently swaying in the soft breeze while you are contemplating your PhD-project, the sound of your old, rusty bike that rasps in the morning with every circle of your pedals on your way to the UMCG; pitches, with the silent cry of a baby in the incubator you can't hear but you know must be there, the beep in the operation room that fluctuates with the level of oxygen saturation of the patient. Even doing a PhD has its own music; a song in quadruple time - actually for me in a little faster tempo, I since it has to be mostly finished in two years - with a rhythm and a melody that brings both chills and tears to your life.

I hope that the song of my PhD will look like this. Imagine it begins with drum rolls and an enthusiastic and thrilling hypothesis: what is the influence of musical training on speech and music perception in cochlear implant users? A new job, a new life, a discovery of a topic in science you might have never heard of before. After this bombastic beginning the first couplet starts slowly with stacks of articles that you must have to go through and that leave you puzzled afterwards. How can you ever conduct experiments on this topic? The refrain kicks in after the first couplet, showing how you and your emotions can be found in a roller coaster during these years: sometimes you think the world will collapse if the next test does not show a significant result, and sometimes you feel like you can climb every mountain, ford every stream once your article has been published in the journal of your choice with a sky-high impact factor. The intermezzo is the point of contemplation: what happened during these last couplets and refrains? Did I make the world a better place? Luckily it concludes with a fantastic end: the drums return, the questions were dead easy and all passed in a glimpse, your answers were brilliant and the mace-bearer shouts: "Hora est." The song ends and you are a doctor.

The end of my project is nowhere near, but as you might have guessed my combined PhD and Ear-, Nose- and Throat residency involves the perception and enjoyment of music in hearing impaired people. Last November I started my PhD (with drum rolls of course) with the hypothesis posed in the introduction. What I really love about my job is that it combines a practical problem with (hopefully) a practical solution. Imagine that due to an accident you become deaf and were lucky enough to be able to get a cochlear implant (a hearing aid inserted into your cochlea) to restore your hearing. Afterwards you discover that you are able to have a telephone conversation with your best friend, but when you plug in your earphones to listen to your favorite song entitled 'the PhD', you find out that it does not sound like it used to. This is where my project kicks in: for normal hearing people, musical training has been shown to be beneficial. In normal hearing people, not only the perception and enjoyment of music are affected by musical training. Also the perception of speech in difficult situations, such as in a pub with background noise or at a party when everybody is shouting at each other and you are not able to understand what your very interesting (J) neighbor is trying to tell you, is influenced by it. My project tries to bridge findings in normal hearing listeners with the hearing impaired, especially cochlear implant users.

Although this may all sound like a dream, I really hope I can improve the perception and enjoyment of music in cochlear implant users. When I am working at the clinic - one day a week I leave science for what it is and work as a medical doctor - and a cochlear implant patient is visiting my consulting hour, I always ask about their interest in music. Mostly the answer is: 'Music does not sound as it used to sound, but I would love to listen to music again.' I hope I can make this wish come true and maybe the end of the song does not involve the words 'Hora est', but the interesting cochlear implant user and me sitting at a party, chatting around and finishing the night dancing until we drop on our favorite song 'the PhD'.

■ CHRISTINA FULLER