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BCN New Year's Meeting



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On the evolution of colourful cichlid fish

Interview with a VENI grant winner: Dr. Martine Maan

Martine Maan's career started with a job at the Royal Netherlands Airforce. At the time, people were discussing the possibility of developing an airport at sea, so one of the things she and others did was investigate bird movements in coastal areas using radar. The data on bird densities they collected contributed to the abolishment of the plans – due to seasonal migration as well as local movements of gulls, there were too many birds to allow for safe air traffic.

After this fun and interesting job, Martine started a PhD at the University of Leiden, where she investigated the role of female mate choice in the process of speciation, using the very colourful and species-rich cichlid fishes of Lake Victoria (East Africa) as a model system. After her PhD, she obtained a Rubicon grant (NWO) to go to the University of Texas at Austin and work on another colourful and species-rich taxon: poisonous frogs. This project brought her to Panama, where she explored the effects of both sexual selection (by female choice) and natural selection (by predators) on the evolution of colour differences between frog populations.

However, the beautiful cichlid fishes stayed in her mind. Therefore, she chose to use these species for her next project in 2009. For this project she received grants from both the Swiss and Dutch science foundations, and worked at the University of Bern and the Eawag Institute of Ecology, Evolution and Biogeochemistry near Luzern. In 2011, she moved to the University of Groningen.

Most of the research you've done has focused on the evolution and role of sexual selection, why did you choose this topic?

I am one of those biologists who thinks that evolution is not a topic, but the essence of life (cf. Dobzhansky 1973). Any living thing, its component structures and emerging properties, is shaped by selection, and in turn influences the evolutionary process. This implies that evolutionary thinking can contribute to the understanding of any biological problem.

Sexual communication fascinates me for many reasons. It gives rise to beautiful, extravagant and



> I am one of those biologists who thinks that evolution is not a topic, but the essence of life <

sometimes ridiculous traits and behaviours, and many animals spend a lot of time and energy in attracting and selecting mates – including humans. Variation among individuals in how well they do this has major consequences for the probability that their genes make it into the next generation and thus for the direction of evolution. I find the consequences for species isolation particularly interesting: when and how do sexual signals and mate preferences change, such that populations no longer exchange genes and become reproductively isolated species? Anyone who looks out the window, listens to bird song, or watches

>> CONTINUATION INTERVIEW WITH A VENI GRANT WINNER: DR. MARTINE MAAN



> *Instead of adapting to where you find yourself, perhaps individuals actively seek out environments that they are well-adapted to already* <

nature documentaries on TV can see that there is an incredible diversity in sexual signals out there. And yet, we understand very little about how this diversity has evolved.

Do you think sexual communication played a major role in the emergence of new species, or did it only play a small part in it?

This is something that Darwin already speculated about (in 1871!), but quantifying the contribution of sexual selection to biodiversity is still one of the holy grails in speciation research. We do know that overall,

taxa in which sexual selection is strong tend to have more species. But the effects are more pronounced in some taxa (e.g. fish, insects and birds) than others (e.g. mammals). And sexual selection alone is generally not enough to drive speciation: it interacts with other diversity-generating processes, such as ecological adaptation and geographic isolation. We also know that sexual selection can lead to species extinction, because it may reduce genetic diversity and drive the evolution of traits that actually compromise survival.

Thus, it is a complex question that requires

contributions from different biological disciplines. One major challenge is to translate specific mechanisms, that are now being identified in a few popular model organisms to global patterns of species diversity.

My own intuition is that sexual selection is involved in many instances of speciation, but its signature is not always clearly visible. This is because species differences in sexually selected traits may be relatively transient, and are often quickly followed by other differences that determine species persistence and coexistence.

You received a VENI grant for your current project. Can you tell us more about the funded project?

I use the cichlids to investigate how sensory adaptation affects species-specific mate choice and reproductive isolation. Cichlids are very colourful, and females look at male coloration to select a suitable mate. At the same time, cichlids inhabit diverse light environments, as they occur at different depths and in both clear and turbid waters. They adapt their eyes to these conditions; species inhabiting red-shifted light environments have red-shifted visual pigments and also express these pigments at higher levels. The question is whether such differences can affect female choice for male colours, such that fish inhabiting different light environments end up selecting different mates. This could be a very rapid mechanism for the evolution of new species and may occur in other taxa as well –but experimental evidence is scarce.

I address this question using two closely related species that occur at different depths in the lake, and that have different male colours and different visual systems. I try to manipulate the expression of visual pigments by raising the offspring of the two species, as well as hybrids between them, under two light conditions that mimic deep and shallow habitats in the lake. I subsequently document the mate choice of the females, and other visual behaviours, to see how changes in colour vision, either genetically encoded or phenotypically plastic, influence the extent of reproductive isolation.

In addition to the experimental work, I try to explain more general patterns. If visual adaptation indeed contributes to speciation, we should see the signature of this mechanism in the distribution of colours and species in the lake. I use spectral data that I collected in the field, of fish coloration and light conditions, to test whether colour differences between species and populations correspond to variation in underwater light

>> CONTINUATION INTERVIEW WITH A VENI GRANT WINNER: DR. MARTINE MAAN

environments. For example, I expect that clear waters allow colour signals in a broader spectral range than turbid waters, resulting in greater colour diversity and possibly also greater species diversity.

Tijs Goldschmidt's book 'Darwins hofvijver' (Darwin's Dreampond) talks about the introduction of the Nile perch in Lake Victoria in the 50s and the consequent disappearance of the cichlids. You are currently working with cichlids, do you still see an effect of this introduction? Does it affect your study? Has the ecosystem stabilized?

The ecosystem is not stable at all. Some cichlid species have survived, and a few species seem to recover, but many are gone forever. The current Nile perch fisheries may benefit the cichlids, but the drastic reduction in species diversity is likely to compromise the resilience of the ecosystem as a whole, and it is hard to predict what is going to happen.

My own research is focused on species that inhabit relatively shallow waters around rocky shores, where the Nile perch is rare. However, changes have occurred also in these areas. For one, the water has become more turbid, which influences visual communication and species isolation. This implies that the current patterns of species differences are sometimes difficult to interpret: a lack of differentiation may be due to incomplete speciation, but may also result from very recent hybridization due to environmental changes. To some extent, these problems can be resolved with genetic analyses.

What are the results of your project so far?

One thing we've found is that male colours not only differ between species, but also between populations of the same species that live in different environments. Particularly in species inhabiting deeper waters, where the light conditions are strongly affected by

water turbidity, we find that towards clearer waters, colours are more saturated and reflect more light at the extremes of the available spectrum. Interestingly, different body parts of the fish, which express different colours, change in different ways – indicating different functions or constraints. We also found differences in visual pigment expression between species and populations, with fish in deeper or more turbid waters expressing higher levels of red-sensitive pigments. Together, these results confirm that the visual environment is really important for how the fish adapt and communicate with each other.

In my laboratory fish, it seems that the experimental light conditions have major effects as well. But I am still in the middle of data collection, so I can't say much about that yet.

Notwithstanding being in the middle of collecting your data, what kind of projects do you plan to work on in the near future?

In the future, I would like to sort out the relative importance of genetic vs. environmental contributions to visual adaptation and divergence, and the role of habitat choice in speciation: instead of adapting to where you find yourself, perhaps individuals actively seek out environments that they are well-adapted to already. This kind of plasticity could greatly affect how evolution proceeds and how species communities are assembled.

I would also like to resolve a few remaining mysteries in the poisonous frog system. For example, we discovered extreme differences in toxicity between differently coloured populations of frogs, but we have no idea what the physiological mechanisms or fitness consequences are.

■ BY FREDERIEKE Vlieg

Introducing a new staff writer

> FREDERIEKE VLIEG



In September 2009 I started studying for a Bachelor's in Biology at the University of Groningen. Last July I completed those studies, and continued with the BCN Research Master. During my Bachelor's studies, I discovered I like behavioural biology, and therefore decided to focus on this topic. However, I'm interested in a lot of topics, and as a result I chose to do my minor in another field: philosophy. Studying philosophy changed my view on certain things and taught me to be critical. In addition to my studies, I'm a member of the student music association Bragi, where I play the violin in the orchestra. I also participate in several committees, and last year was a member of the board of Bragi. In December I joined the BCN newsletter team to meet interesting people and to practise my English writing skills.

BCN New Year's meeting 2013

BCN Summary Prize winner:

> Jojanneke Bastiaansen

BCN Dissertation Prize winner:

> Jelmer Borst

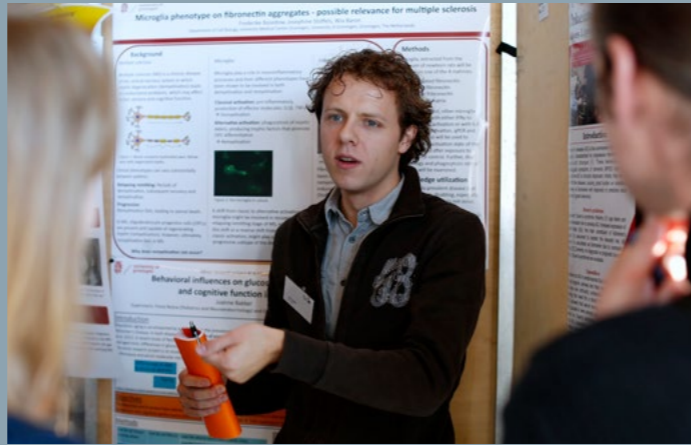
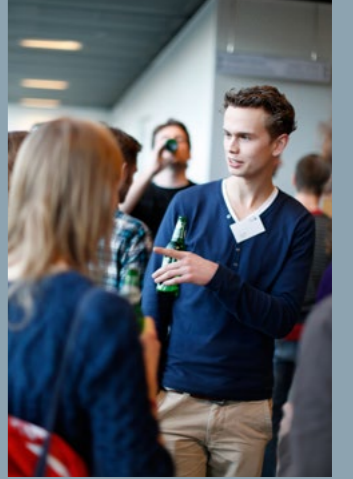
BCN Poster Prize winners:

- > 1st Prize: Koen Hogenelst
- > 2nd Prize: Hedwig Kikkert
- > 3rd Prize: Jefta Saija

■ PHOTOS: MICHEL HOOIVELD
& SANDER MARTENS



>> CONTINUATION BCN NEW YEAR'S MEETING 2013





Interview with the 2012 Han Nakken Award winner Dr. Vera Munde

Professor Dr. Han Nakken is seen as one of the pioneers in research focused on improvements of the care of individuals with Profound Intellectual and Multiple Disabilities (PIMD). Every two years, the Research Centre on Profound and Multiple Disabilities at the Faculty of Behavioural Sciences, in cooperation with the Foundation for Research on Education and Support for Individuals with PMD (“Stichting Onderzoek naar Opvoeding en Ondersteuning van personen met ernstige meervoudige beperkingen”), awards the Han Nakken prize to the best scientific research in the field of individuals with PIMD. The award was founded in 2010, the year professor Nakken died, to remember and honour his work.

Last December, the Han Nakken prize for best scientific research was awarded to Dr. Vera Munde, postdoc at the Department of Special Education at the University of Groningen. Dr. Munde was awarded for her article ‘Catch the wave! Time-window sequential analysis of alertness stimulation in individuals with profound intellectual and multiple disabilities’, which was published in *Child: care, health and development* in 2012. Dr. Munde found that the levels of alertness in individuals with PIMD changed in slow waves of about 20s from ‘active alert’ to ‘passive alert’. By using the information about alertness reactions to stimuli, support staff could provide more tailored care for these individuals. We talked to Dr. Munde about her award and her research.

First, congratulations on your award! You were awarded for the best scientific research performed in the field of individuals with PIMD. To begin with, can you introduce this group of patients to us?

People with PIMD are a very special group. They have in common that they are all dependent on the care and

support of other people for almost all every day activities, but there is also large variability between individuals in the degree of severity and the combination of disabilities. Individuals with PIMD experience profound intellectual disabilities and serious motor and sensory disabilities. This means that they will never reach a higher level of development than that of a two-year old. In addition, the majority of these people are bound to a wheelchair, have disturbed sensory perception, and have additional health problems, e.g. epilepsy, upper respiratory tract infections or eating and sleeping problems. Note, however, that while at first sight the disabilities are most striking, these people do also have a lot of abilities.

What was the main reason that inspired you to study individuals with PIMD? And can you emphasise the importance of this field of research?

Before and during my studies I worked at care centres. Therefore I recognised the issues I encounter in my research from the practical field, and therefore I also know how important this research is. These people are

dependent on others in almost every way and so it is important to gather more knowledge on how support staff can tailor their care and make it as individualised as possible.

So you also have worked with these people in practical settings?

Yes, because my mother works with people with PIMD, I became acquainted with them at an early age. After secondary school I wanted to discover if I would like doing this work myself and therefore I worked with elderly people who had different disabilities for one year. In this residential home lived also people with PIMD, and this experience made me so enthusiastic that I started studying special education. During my studies I did not want to lose contact with the practical field, and so I kept working part time at a care center for young people with PIMD, and I have also been a personal supervisor of persons with PIMD during several holidays.

You won the award with an article that is part of your dissertation. How do you feel about winning this prize at a relatively early moment in your career?

Of course I am really happy with winning this prize. A PhD project is a long period where working on your research is often quite lonely, and during this period you sometimes wonder what the point is of all this work. In this light, the day of your thesis defence is a nice reward and for me, winning this prize is an extra appreciation and also motivation for my work in the future.

> Winning this prize is an extra appreciation and also motivation for my work in the future <

>> CONTINUATION INTERVIEW WITH THE 2012 HAN NAKKEN AWARD WINNER DR. VERA MUNDE



Professor Nakken was your supervisor during your PhD project for the first two years. Can you describe his influence on research concerning individuals with PIMD and on your own work?

Professor Nakken is the reason that the world of science took notice of individuals with PIMD. Worldwide he is seen as one of the pioneers who has emphasised the importance of research done in this field and his work is certainly fundamental for current research projects. The fact that he was so experienced was also really useful for my own project. He was very critical about my ideas and writings, but he was also always available for questions or a short meeting. In this way, he acted as my sounding board and my discussion partner. He has contributed a great deal to my way of thinking about being a researcher and the world of science in general.

One of the remarks in the report of the jury was that your research has great potential to have consequences for support staff of persons with PIMD. Can you explain why your research could be relevant and applicable in practice?

One of the main preconditions for learning and development of individuals with PIMD is alertness. Support staff is often wondering when a person with PIMD is alert or how they can create this alertness to offer some kind of activity. These people often are only alert for a very short period of time and their expressions of alertness are very subtle. These complications make the work of the support staff even more difficult.

Our research has shown that the observation of alertness can help to find answers to these kind of questions. Earlier research had already shown that periods of alertness are very short in this group of people and we found that after a decrease of alertness, often a new period of revived alertness occurred. So the alertness was following a wave pattern, and

>> CONTINUATION INTERVIEW WITH THE 2012 HAN NAKKEN AWARD WINNER DR. VERA MUNDE

as suggested in the title of our paper, it is therefore important for support staff to catch the right wave in this pattern of alertness. That way, based on individual reactions and preferences, support staff can tailor their care to the needs and possibilities of a person with PIMD.

> *Professor Nakken is the reason that the world of science took notice of individuals with PIMD* <

What kind of research would you like to see in the future following your own article?

Spontaneously, three lines of research pop up. First, I would like to study the usability of an observational tool that we use, the Alertness Observation Checklist. I have had a lot of conversations with support staff about this tool and while everybody admits that it is a useful tool, there are also a few difficulties, for example that it is pretty time-consuming. So I would like to study the use of this list in practice in more detail. Second, it would be nice if we could discover additional methods which can circumvent the disadvantages of observational methods, as for example observer subjectivity. The final thing I came up with is a longitudinal study where the long-term effects of the application of our study results in practice are observed. The alignment of the care with the development of a person with PIMD could have important implications and it could provide interesting information for both scientists and the support staff.

After your PhD project, you started as a postdoc at the Department of Special Education at the RuG. What is your main field of interest at the moment?

My current research topic is still individuals with PIMD. As a postdoc, I study the relationship between alertness and vestibular stimulation, a special kind of stimulation which is related to a combination of movement and balance, as for example swinging. I am also still interested in research about pre-conditions of learning and development. Following this interest, I would like to study the extent to which people with PIMD can recognise themselves, and how they perceive the world around them.

Being a young, female scientist, what are your ambitions for the future?

As I already mentioned, the research concerning alertness has raised more questions and therefore I would like to continue my work in this field for a while. Furthermore, I would like to go abroad for some time. For my PhD project I was in Belgium for six months, and this experience showed me that the world of science can have a completely different character in another country. This made me curious about other countries and their way of doing research, and therefore it would be nice to get to know other, foreign research groups which also study people with PIMD.

■ BY CHARLOTTE WILLEMS

■ PHOTO: SANDER VAN LIEN

Introducing a new staff writer

> CHARLOTTE WILLEMS



My name is Charlotte Willems and I recently started a PhD project at the Neuroimaging Center (NIC). During the next three years, I will try to reveal the underlying mechanisms of our attentional system by studying a phenomenon called the attentional blink. Just after I started my PhD, I was asked to join the BCN Newsletter committee as a staff writer. Because I am curious by nature and I like writing, it was an easy decision.

My background is in neuropsychology, which I studied here in Groningen. I finished my Master's programme last august and I started at the NIC right after graduation. One of my characteristics is that whatever I do, I want to do it well. Therefore, I will be fully committed to my PhD project for the next period and in addition, I will try to add some interesting, meaningful and creative input to the BCN Newsletter.

■ PHOTO: SANDER MARTENS

Interview with Prof. Raja Parasuraman

Speaker at the BCN Jubilee Symposium



Please introduce yourself! What's your background and how did you get to where you are today?

I am Raja Parasuraman, PhD, University Professor at George Mason University, Fairfax, VA, USA.

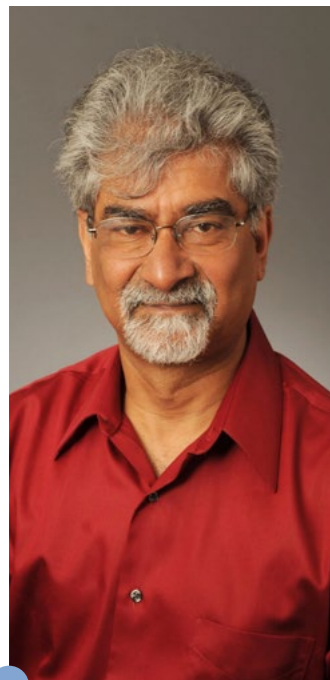
I was born and grew up in India and spent the first 16 years of my life there, living in Delhi, Mumbai, and Goa. I then got a scholarship to finish my high school diploma ("A" Levels) in the UK. After a year spent working in

industry and traveling through Europe, I was admitted into the B.Sc. programme in Electrical Engineering at Imperial College, University of London. For my Bachelor's thesis project I designed and built an analog-to-digital converter and multiplexer for use in the analysis of bioelectric signals. Those signals happened to be brain waves, or EEG. I started reading about EEG and found that psychologists and neuroscientists used it to evaluate human functions such as alertness and attention. That got me interested in psychology, human factors, and

neuroscience, and so I went into a PhD programme in those areas at Aston University, Birmingham. I graduated from Aston University with a PhD in 1976. I then went on to a postdoctoral fellowship to the University of California, Los Angeles, where I did further work on EEG and attention. In 1982 I was appointed Associate Professor of Psychology at the Catholic University of America, Washington DC, where I worked for 22 years. In 2004, I was recruited by George Mason University, where I have been ever since that time.

> *There are many 'snake oil' salesmen out there selling fake remedies* <

>> CONTINUATION INTERVIEW WITH RAJA PARASURAMAN



> He exhibited perfect performance throughout a 40-minute attention task. That got me interested in cognitive superstars <

What sparked your interest in individual differences and cognitive expertise? What makes “cognitive superstars” particularly interesting to researchers?

Individual differences are usually treated as a “nuisance” or “noise” in psychological research, because they often can mask the “signal”, the psychological function of interest. But about 15 years ago, in the course of analyzing a large data set in a study of sustained attention, I noticed that several individuals did not show the typical decline in performance over time on a task, which is typical of group performance. And a few years ago I came across an individual who not only did not show any decline over time, but exhibited perfect performance throughout a 40-minute attention task. That got me interested in “cognitive superstars”, because it turned out from other testing that this individual was one.

Studying dysfunction and people that can, for one reason or the other, not do certain tasks is very common in psychological research. Its logical counterpart, studying people that show extraordinary performance on such tasks, much less so. Any idea why?

The study of dysfunction is well motivated by the desire to help individuals overcome their deficits, particularly in neurological syndromes such as brain damage, or in conditions such as attention deficit disorder. So there is a strong motivation and grant funding to support such research. On the other hand, people who are at the other end of the spectrum typically do not attract such attention from researchers, unless they also have a deficit elsewhere, as in the case of autistic savants.

Your research is very diverse, using neuro-imaging (both EEG and fMRI), behavioral experiments, and genetic studies. Do you think that any one of those approaches can reveal new insights or is it all about the interaction of those different levels?

Each can answer different specific questions at multiple levels of analysis. For many questions, behavioral studies are sufficient. If one wants to know whether a particular brain region or network is responsible for either superior performance or dysfunction, then neuroimaging is appropriate. If one wants to know whether superior performance is due to enhanced early processing in the brain, then ERPs can provide an answer.

Today, people play “brain fitness games” and do “brain gymnastics”, hoping to increase their cognitive abilities or preventing them from decreasing with advancing age. Will people soon be buying 9V batteries and building their own tDCS setups?

Unfortunately, there are many unvalidated techniques out there in the market place, and I worry that too many older adults may opt to use “brain fitness” games that have not been proven to be effective in randomized control trials. To use a phrase common in the time of the American Wild West, there are many “snake oil” salesmen out there selling fake remedies. As to tDCS, in my opinion, it is still not “ready for prime time”. We need to do more studies on the long-term effectiveness and safety of the technique before it can be recommended for everyday use, although I believe people are already starting to do it.

Many people are not functional before their first cup of coffee and, slightly more extreme, some students are known to use prescription drugs in an attempt to increase performance during periods of extensive studying. Is the idea of supercharging cognition using brain stimulation the next logical step or fundamentally different?

I like to think of supercharging cognition as allowing people to reach their potential, not as a drug or something to use casually. That is why we have been focusing on learning, and accelerating learning rate. Everybody gets better with practice, but if we can speed it up, we can allow all individuals to reach the best of their potential capability.

Do you see any ethical problems with speeding up learning using brain stimulation (cf. doping in sports)?

Many ethical issues will indeed need to be addressed. We will have to make sure that any techniques that are released into the market are proven to be reliable and are equally available to all, so that social inequities in access to technology are not exacerbated. Articles by Martha Farah and colleagues have addressed many aspects of the problem. I think we should not duck away from the ethical issues but address them head on.

■ BY FLORIAN SENSE

■ PHOTOS: SANDER MARTENS & RAJA PARASURAMAN

How heart failure is associated with depression and cognition

Interview with Dr. Regien Schoemaker

How can heart failure affect the brain, leading to depression and cognitive decline? Dr. Regien Schoemaker is an Associate Professor of neurocardiac interaction and can provide answers to this question. Working at the Department of Molecular Neurobiology, she combines research on cardiology, neurobiology, and behaviour.

You are an Associate Professor of neurocardiac interaction. Could you briefly explain what this means?

In short, our research focuses on the interaction between heart and brain. Within the body, the functioning of the different organs is highly connected. Whereas this is more and more recognized for the peripheral organs, only recently the role of brain/peripheral organ interactions has been noticed.

Coming from a research area of experimental cardiology, we realized that heart failure affects not only the cardiovascular system. Rather the whole body, including the brain, is involved and ultimately determines the outcome. For instance, patients with cardiovascular disease are 2-3 times more likely to develop depressive symptoms and cognitive dysfunction, while the other way around, depressed patients have a higher chance of developing cardiovascular disease. Moreover, patients suffering from both diseases have a substantially worse prognosis. Treatment directed to either disease usually does not improve the other; anti-depressive therapy is not associated with improved cardiac function or cardiovascular outcome, and vice versa. As long as the underlying mechanism for this interaction is fairly unknown, any therapeutic approach is limited. Our research goal is to investigate this underlying

mechanism in experimental animals as well as in patients, in order to open new avenues for therapy. Our working hypothesis is that peripheral disturbances evoke the release of markers of inflammation, which may enter directly or indirectly into the brain, and cause persistent inflammation in certain brain areas. This inflammation is associated with altered neuronal function, as indicated in depression and cognitive decline.

Could you tell us more about your background and how you reached your current position?

I have an academic degree in Biology (Groningen) and Behavioral Physiology, and focused on social stress-induced hypertension and stress-induced cardiac arrhythmia. After that I did my PhD in Maastricht at the Department of Pharmacology, on the development of an animal model for the pathophysiology and treatment of heart failure. This model used rats with an experimental myocardial infarction, and I have continued to use it throughout my scientific life. In addition to chronic measurements of cardiac function in conscious rats, we developed behavioral tests to evaluate aspects of (reduced) quality of life, as seen in patients with heart failure. During a postdoc period in Canada at the University of Ottawa Heart Institute, this work on social stress-hypertension research was

extended, and in vitro techniques to obtain cardiac function and some biochemistry techniques were mastered in order to study cardiac adaptation to different types of increased load. Subsequently, I continued this experimental cardiac research as assistant professor at the Department of Pharmacology at the Erasmus MC Rotterdam. My return to Groningen was based on an invitation to help facilitate experimental cardiovascular research at the Department of Clinical Pharmacology, and later, the Department of Experimental Cardiology. Since the focus of this research had rather moved to the heart itself, I broadened my focus to heart/other organ interactions, first heart-kidney, and more recently heart/brain. Having a main experimental cardiology background with an interest in neurobiology and behaviour, being situated at the Department of Molecular Neurobiology is a unique opportunity to combine these areas of interest.

What projects are you working on at the moment?

Two major lines of research, both of which work with the hypothesis that peripheral inflammation may lead to inflammation in the brain and, hence, disturbed neuronal function which can be associated with altered behavior. This fits well into the general vision of the Department of Molecular Neurobiology, headed by Professor Eddy van der Zee, and is in close collaboration with our expert on brain inflammation, Professor Uli Eisel.

The first project is aimed at the question of why elderly patients often respond to surgery with persistent cognitive decline. This project forms the



> Patients with cardiovascular disease are 2-3 times more likely to develop depressive symptoms and cognitive dysfunction <

>> CONTINUATION INTERVIEW WITH DR. REGIEN SCHOEMAKER

experimental part of the Rosalin Franklin Fellowship of Barbara van Leeuwen at the Department of Surgery, UMCG. Parallel to studies in patients, in our group we developed an animal model to study the underlying mechanisms which Iris Hovens is working on for her PhD project: Is the surgery-induced release of inflammation markers responsible for cognitive decline, and what makes the elderly more vulnerable to this effect? This latter aspect forms part of our central theme “healthy aging brain”.

The second project relates directly to the previously described focus on heart/brain interaction, and is aimed at the question of why patients with myocardial infarction more often develop depression and/or cognitive decline, and what we could do about that. As in patients clear gender differences are observed, we pay attention to this aspects in animals as well, with both Hiu Liu and Leonie Gouweleeuw working on PhDs on this topic. Moreover, recently observed increased levels of circulating factors that seem to associate with depression in patients with and without heart failure provide a new tool for experimental investigation; Pieter Naude is working on a postdoc project on this topic.

> Go for what you really want! <

How could patients with cardiovascular diseases benefit from the findings of this line of research?

Depression and cognitive impairment have a strong negative impact on quality of life. In addition, adherence to medication and life style changes, which is very important with heart failure, is lower. As patients with cardiovascular disease are shown to have a higher chance of developing these mental disorders, they are even more vulnerable to jeopardizing their outcome. Our line of research may provide new directions for therapy to improve the quality of life of the cardiovascular patient, but not at the expense of cardiovascular prognosis.

The underrepresentation of female scientists at higher positions is still a topic of great importance. Were there moments in your career in which you felt that your gender played a role besides your proficiency?

Yes, there were! Still I am not opting for “only female” actions for grants or positions, as I have the opinion that the best person should do the job, irrespective of their gender.

What would you advise female researchers who are at the beginning of their career?

Go for what you really want and not against what you don’t want (i.e., do not put energy in negative things, such as fighting the system), and really go for it. Do it the way it feels right, even though it may not completely fit within the (mainly male) existing organization.

What are your plans for 2013?

Find answers to our research questions, and formulate new ones.

■ BY SABINE SCHOLZ

Introducing a new staff writer

> SABINE SCHOLZ



Soon after I started to study psychology at the University of Groningen, I developed a strong interest in cognitive neuroscience. Because of that, I took every cognitive neuroscience course I could, and completed an internship at the Neuroimaging Center. While working on my Bachelor’s project on conscious visual perception, it became clear to me that I wanted to pursue a career as a researcher. Therefore, I applied for the C-track of the BCN Research Master. Now the first semester has nearly passed and I have enjoyed the time very much. In February, I am going to start my minor project on quick decision-making. I am looking forward to investigating this topic and the learning experiences that will come with it. Besides cognitive neuroscience, my second passion is music. I sing in several classical choirs in Groningen, which relaxes me after a day of studying. One month ago, I was asked to write for the BCN Newsletter, which I was very pleased about. I am excited to take on this position and am looking forward to meeting other researchers from BCN.

Chronobiology in practice: Chrono@Work B.V.

Interview with Dr. Marijke Gordijn

Dr. Marijke Gordijn is a researcher in the Department of Chronobiology. Just recently she started her own company Chrono@Work B.V. She will combine her job at the university with working for her company.

You recently started the company Chrono@Work B.V. Why did you start it? What is the company's goal?

In society, there is a growing interest in our field, or at least I think that should be the case. The knowledge obtained in chronobiological studies needs to be transmitted to society. Society needs to be informed, and translational studies are needed to use the knowledge obtained from more fundamental studies. It sometimes means that short, applied studies are needed to test a certain prototype or to test a therapy. Over the past few years, we – at the university – were often contacted by companies to perform those tests or to give advice based on our chronobiological knowledge. I feel that this work is better carried out through a company than at the university. The topics may differ from treating circadian rhythm sleep disorders, (winter) depression, or shift work syndrome, but on the other hand it could also be to optimise daytime functioning, sleep and healthy ageing. Our main focus at the moment is the use of light, but I hope we will learn more about optimal meal timing as well. With the help of a few colleagues I decided to continue this type of work in a company. The company is a spin-off company of the university and will

use the knowledge obtained in the academic world for advice, training and applied research. Also in the other direction, knowledge and questions obtained from studies performed by the company may be used as input for more fundamental studies at the university.

Besides Chrono@Work B.V. other companies exist that focus on improving working in 24/7 society or making a more optimal usage of light. However, it is the only B.V. with a focus on chronobiology in general. Despite this general focus, the focus of the first orders the company received is on the usage of light to optimise non-visual effects. One of the orders is from Philips Consumer Lifestyle.

What kind of order did you receive from Philips Consumer Lifestyle?

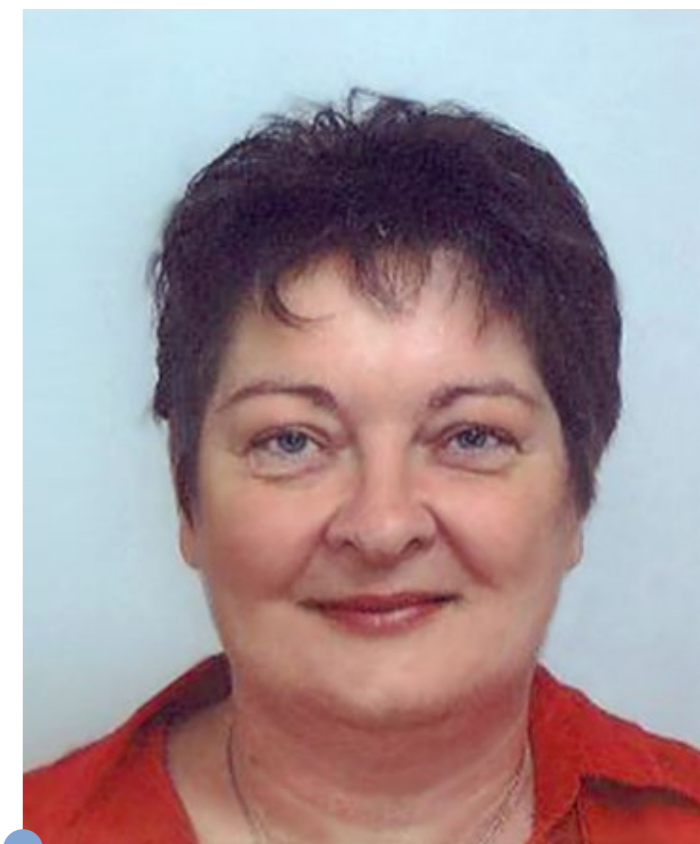
In general, we search for the optimal parameters of light, both in colour, duration and timing, to treat late chronotypes and/or to improve daytime functioning. In a study that we just finished, we treated late chronotypes with two light devices early in the morning to see whether we were able to induce not only a phase advance of the clock, but also of sleep. Data analysis is in

progress. Currently we are trying to fight daytime energy dips with light. The effects of light to improve alertness and cognitive functioning have often been tested at night, when we are not normally exposed to light. The question now is whether it is possible to improve cognitive functioning in offices during daytime, with the idea that the current lighting in offices is good enough for visual performance, but not optimal for the non-image forming effects of light.

Chrono@Work not only has companies as clients but also the RUG. For the RUG, Marijke Gordijn continues to support research projects on human chronobiology and supervises students in their bachelor and masters projects. This was made possible by an agreement between Chrono@Work and the Faculty of Mathematics and Natural Sciences. It gives her a nice start up and at the same time there is a continuation of her availability to teach and give support in the Chronobiology group. In addition, the company receives orders to give workshops or lectures, and to give advice on certain topics.

Is it easy to combine having a company with working at a university?

It is hard work, and at the moment there is more work than hands and brains available, but it is



> I feel that this work is better carried out through a company than at the university <

>> CONTINUATION INTERVIEW WITH DR. MARIJKE GORDIJN

exciting. The projects I am supervising are to be continued, and now there is a business to run as well. I have two temporary employees in the company that take over part of my work. Without them it would not be possible to develop the company and make it a success. For me, running this spin-off company is the optimal solution for combining science and business, and the collaboration with the university is the basis of success. The company cannot do without the university and I hope that the university will really benefit from my company.

If your company becomes very busy, will you want to stop your work at university? Or do you want to continue to combine both jobs?

If the company will become a success, and I hope and expect it will (!), I will be more involved in running the company. However, as I said, the connection between the company and the university is very important. For that reason I will continue to be part of the Chronobiology group as well.

Before starting this company, Marijke Gordijn's career was entirely focussed on science. She completed a Bachelor's in Biology at the University of Groningen, and completed her PhD at the University Medical Center in Groningen. She may have been one of the first PhD students in BCN. Her PhD focused on the relationship between the biological clock, sleep and mood. She studied mood longitudinally over long periods in severely depressed patients. After the four years of her PhD appointment, she continued working at

the Psychiatry Department on related research topics. After a period of 11 years she went back to the Faculty of Mathematics and Natural Sciences to lead the work on human chronobiology in the lab of Serge Daan.

Your PhD focused on the relationship between chronobiology and depression, did you find a relationship? And if so does depression cause sleeping problems or do sleeping problems cause depression? Or do both happen?

Chronobiology is an important factor in everyday life, both in physiological and in psychological processes. The 24h rhythms in our body determine to a large extent at what time of the day we want to sleep, when we are best in mathematics, in fine motor skills and when we feel optimal. Although mood is a complex feeling, and of course many factors play a role in feeling depressed, sleep and the biological clock play an important role as well. Depressed patients often complain of sleep disturbances, and on the other hand people, that are chronically sleep-deprived complain of depressed mood. In other words there is a clear relationship in both directions. In addition to the effects of sleep on a depressed mood, the biological clock also plays a role in depression. Depressive patients often complain of a more depressed mood in the morning than in the evening, which is an interesting phenomenon for a chronobiologist. The question of my PhD was whether a delayed or advanced clock was underlying major non-seasonal depression, and whether inducing a small shift could improve mood in depressed people. This was not the

case. On the other hand, keeping depressed people awake for one night, could improve mood in about two thirds of the severely depressed people. Patients responding to this therapy were the ones showing diurnal variations of mood and they were more capable of improving with the other therapies as well. The conclusion was that it was not a disturbance of the biological clock that was underlying depressed mood of patients and the response to sleep deprivation, but unfortunately I could also not unravel what the mechanism actually was.

> I am intrigued by studying the interaction between the biological clock, sleep and light and the importance for everyday life <

Most of the research you've done focused on chronobiology, where does your fascination for this topic come from?

It started during my Master's project on energetics in Kestrels under the supervision of Serge Daan. At that time Serge was collaborating with Domien Beersma, now head of the Chronobiology Department, and Alex Borbély in Zürich, on developing the two-process-model of sleep regulation. I thought sleep was fascinating. On average, most of us sleep almost one third of our lives and nobody really knows why. But we cannot live without it; we really suffer from sleep deficits, both in terms of health and in terms of daytime functioning. The optimal sleep phase is determined by the interaction between the biological clock and the sleeping process

itself. So, to study sleep and daytime functioning we need to understand more of the role of the biological clock. Actually in the scientific world there are many chronobiologists studying the biological clock, and many sleep scientists studying sleep and sleep disorders. It seems logical to combine both fields, but there are not many groups doing this. I am intrigued by studying the interaction between the biological clock, sleep and light and the importance for everyday life.

A lot of things you investigate are quite easy to apply in practice. Do you apply the knowledge you obtain with your studies to your own life?

Well, there is a Dutch saying: "Bij de loodgieter thuis lekt het"... It means I am not always following my own advice. All the time I hear myself saying that you should not work late before going to bed, and I know I am one of those doing that all the time. On the other hand, I reduce my exposure to light in the evening, also from my computer screen, and I try to be exposed to early morning light to improve waking up and not shifting too late. In winter we occasionally use a bright light device at the breakfast table because I have two sons who go to high school and have to start very early. Therefore we all suffer from having to get up earlier than we wish, and are more or less sleep deprived. But by using the knowledge we reduce the detrimental effects. I am convinced that we all will benefit from the knowledge obtained in the chronobiological field, both in our private lives and in the medical field.

■ BY FREDERIEKE Vlieg



Interview with Else Havik

Wayfinding and accessibility for visually impaired people

Else Havik (Haren, 1978) studied psychology at the University of Groningen. In October 2012, she also received her PhD from the RuG. She conducted her research at the Laboratory for Experimental Ophthalmology at the University Medical Centre Groningen and at Royal Dutch Visio, a centre of expertise for partially sighted and blind people. The title of her thesis is “Wayfinding for visually impaired people. Opportunities and challenges.”

First, congratulations on your PhD degree. Could you briefly tell us what your research is about?

My research is about mobility in visually impaired people and the accessibility of public spaces for these people. We focused on a particular type of public space – “shared space” – which is a relatively new concept for designing public spaces. The basic idea of a shared space is to create a public space in which the predominant infrastructure (separation of sidewalks and streets, traffic signs and signals) is minimized and a collective participation of the same space is encouraged. In particular, this means the reduction of traffic lights and conventional structures as curbs and crossing places. This concept is meant to encourage communication between traffic participants and enhance alertness and responsibility.

What prompted our research was the concern for how accessible and safe these spaces are for visually impaired people, and the question whether these people avoid shared spaces. The mixed traffic and lack of structure makes it quite hard for visually impaired people to orient and feel safe. For this reason, organisations representing the group of visually

impaired people encouraged research about how visually impaired people deal with shared spaces and whether they are able to cope with them.

So, the need for this research came directly from the applied field. Except for England, there was no research at all focusing on shared spaces. Opinions and perceptions from different people were available, but no data existed showing how visually impaired people manage to get around in these places and how critical this situation is for them.

Can you name some specific problems visually impaired people have in these areas?

Most problems arise from orientation. Visually impaired people have difficulties knowing if they are in an area where they can only expect pedestrians or also motorised traffic participants. Also, the recognition of side streets seems to be problematic. In shared spaces, visually impaired people can easily enter a side street and drift away from their intended route, because they did not notice that there was a side street by any detectable structure. Crossing the street forms another problem, since there is no structure guiding them to detect where the street starts and where it ends. When crossing the street visually impaired people usually use curb edges to orient and to fix their position perpendicular to the street. This missing guideline makes it very unpleasant for them to use a shared space. I cannot say much about safety, because there is no appropriate data available to show if accidents are more likely in shared spaces than in other environments.



>> CONTINUATION INTERVIEW WITH ELSE HAVIK



> The need for this research came directly from the applied field <

What we did do in my study was ask the participants whether they felt safe or confident when walking in shared spaces. The rating on those scales indicated that people felt rather safe in both conventional and shared spaces, but ratings on safety in the shared spaces were still lower than in the conventional spaces. So, you can't really say that people are insecure in shared spaces, but they found it less pleasant than conventional spaces. For interpretation of these results it is important to realize that in our study, the visually impaired people were accompanied by a test leader who would assist in case of a dangerous situation.

You also did research on how to improve shared spaces for visually impaired people. To me that seems quite difficult, because the purpose of shared spaces is to lessen the conventional structure which, on the other hand, is what visually impaired people especially rely on in traffic. As a result of your study you developed a guide with suggestions how to make shared spaces more feasible for visually impaired people. Can you explain how shared spaces can be improved without taking away the intention behind them?

It is definitively a challenge for designers to creatively invent a structure that helps visually impaired people without turning back to conventional arrangements. We developed a guide for designers to help them consider necessary actions for the less sighted people of our society. One important thing for them to know is if they are walking in an area where they can only expect other pedestrians or also motorised traffic participants. To define a border between these areas we do not necessarily need curbs but we can also use other detectable structures such as a difference in paving material or grass areas and little hedges. Designers have to understand that it is important to mark the transition

from one zone to the other and that this marking needs to be tactile for visually impaired people. For people who have some sight left, colours or contrast can be used, but for blind people tactile stimuli are important. The designer might also come to the conclusion that this particular area might not be suitable at all for a shared space.

So, you think that even in a shared space there should be a zone where only pedestrians are allowed. Is that generally the case or only a suggestion you have?

A pedestrian-only zone is not generally part of a shared space but a suggestion that is also advised in the UK where shared spaces are quite popular. The organization Guide Dogs UK, for example, supports the idea of a comfort zone for visually impaired people, which is free of motorised traffic. This zone does not have to be very strictly defined, but the main point is that in shared spaces people can share the space if they want to, but there should be an option not to share for people who have difficulties with this concept. This also applies for crossing points. In general people can cross the street wherever and however they want in shared spaces, but for those who are not able to do that safely there should be especially detectable crossing points. Designers should think about these issues.

I have heard that patient organisations are very pleased with your research and the guide you developed, but how do designers of shared spaces look at your work?

We collaborated with a knowledge centre of shared spaces in the Netherlands. They were very eager to work with us because the concept of shared space has slowly developed over the years without keeping in mind groups with special needs. They are aware of that and they are eager to learn how they can deal

with such problems. The same holds for designers or representatives of communities, who are very interested in our research.

Apart from shared spaces you also did research on electronic travel aids. What specifically did you look at?

We developed an indoor route information system that could be used by visually impaired people inside the University Medical Centre in Groningen. The aim was to make it possible for visually impaired people to independently reach the individual clinics within the hospital. The research questions were aimed at the verbal information the users were given: What information do visually impaired people need to efficiently find their way and to construct a mental image of the route they are walking? We found that it is very useful to initially provide people with a complete overview of the route to build a mental representation. Also, an accessible interface seems to be a very important feature. The future of electronic travel aids is very promising. They are more and more accessible even on mobile phones. As soon as the GPS localisation will become more precise, i.e. telling you if you are in a pedestrian zone or on the street, electronic travel aids could even be used for solving problems visually impaired people have in shared spaces. We have not reached that point yet, but this definitively is a promising development for the future.

■ BY CHRISTINA CORDES



Introducing the BCN Board

The BCN Board currently includes:

Prof. D. Başkent, Otorhinolaryngology
(d.baskent@umcg.nl)

Prof. D.G.M. Beersma, Chronobiology
(d.g.m.beersma@rug.nl)

Prof. H.W.G.M. Boddeke, Medical Physiology
(h.w.g.m.boddeke@umcg.nl)

M.H.W. Hooiveld, PhD, BCN Staff Office
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Prof. A. Johnson, Experimental and Workpsychology
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Prof. H.P.H. Kremer, Neurology
(h.p.h.kremer@umcg.nl)

Prof. B.A.M. Maassen, Neurolinguistics
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Prof. R.A. Schoevers, Psychiatry
(r.a.schoevers@umcg.nl)

Prof. F. Zwarts, BCN Staff Office
(f.zwarts@rug.nl)



Ben Maassen

My main fascination for neuroscience originates from observations that babies and infants – of whatever species – seem to be general purpose learning machines with an incredible flexibility to adapt to almost any natural or cultural environment. From experience during my affiliation as a clinical neuropsychologist for 2 decades at the department of Child Neurology (UMC St Radboud, Nijmegen), I especially learned that neurocognitive and neuromotor deficits in children result in quite different

symptoms and disabilities than neurologically similar, acquired deficits in adults. Seminal, leading publications in this domain bear titles like: “The tortuous route from genes to behaviour” (Karmiloff-Smith, 2006), “Cognitive neuropsychology and developmental disorders: Uncomfortable bedfellows” (Bishop, 1997), and “Gradual emergence of developmental language disorders” (Locke, 1994). In daily conversations with paediatric neurologists, psychiatrists, and professionals such as physiotherapists, speech-language pathologists, and remedial teachers, as well as parents and other care-takers of young children, the topic of conversation frequently addressed the issue that categorical diagnosis is not applicable to developmental disorders or to the developmental consequences of plain neurological deficits, which leads to the conclusion that an etiological model should be probabilistic and multifactorial rather than deterministic or focused on a single neurocognitive cause.

My research focuses on two developmental disorders in children: dyslexia and childhood apraxia of speech (CAS). Neither for dyslexia, nor for CAS, a couple of decades of international research efforts worldwide, have yielded agreed-upon diagnostic criteria or a clear etiological model. Theoretical models of these disorders need to take into account the developmental trajectory comprising interactions between perceptual and motor functions in the case of

CAS, and interactions between auditory, visual, linguistic and more abstract neurocognitive functions like automation in the case of dyslexia. From my move from a medical department to the Faculty Of Arts, I learned two things. First, that linguistics – including theoretical linguistics, in addition to neurolinguistics – has much to offer to the field of speech and language pathology, and second, that linguists themselves tend to do a poor job in bringing this fact to the attention of other disciplines. My personal mission is to demonstrate to researchers and students that these challenging disorders can be understood in multidisciplinary collaborations.

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>> CONTINUATION INTRODUCING THE BCN BOARD



Domien Beersma

Domien Beersma studied Physics at the University of Groningen. He finished his dissertation in 1979 on a biophysical theme: vision in insects. After that he moved to Psychiatry, in the Medical Faculty, to study the influence of sleep, the biological clock, and light on the mood of depressed patients. In 1995 he went back to the Faculty of Science, and continued sleep and biological clock research in the Ethology group. (Note that all of these groups participate in BCN.) In 2005, he became professor in Chronobiology. Today he is also the director of the Centre for Behaviour and Neurosciences (CBN) of our university. CBN wants to understand the causes and consequences of individual variation, from the molecular construction of the biological

clock in the cell to sleep disturbances; from the molecular machinery of energy metabolism to eating disorders; from the neuromolecular pharmacology of aggression and coping with stress to social dysfunction and neuropsychiatric disorders; from the molecular basis of Alzheimer's disease to clinical solutions; from molecular traces of memory to time/place learning; from epigenetic mechanisms to individual variation and Darwinian fitness. In addition to this kind of fundamental research, CBN aims to solve major questions concerning human and animal well-being, and to provide an attractive research and training programme for students and young scientists. CBN as a whole participates in the research school BCN.



Deniz Başkent

Prof. Dr. Deniz Başkent is the chair of the BCN Education Committee, and a new member of the BCN Board. She overtook these positions from Prof. Dr. Natasha Maurits only a few months ago, but she is already enjoying working in the committee and on the board immensely.

Since joining UMCG as a Rosalind Franklin Fellow in 2009, Deniz has been active within BCN, first chairing the BCN Newsletter, and then co-organizing the first BCN Investigator Meeting with Natasha. Her background and research interests are very multinational, including Turkey and the USA, and also very multidisciplinary, including the fields of engineering, linguistics, and medical, behavioral and cognitive sciences

just to name a few. Therefore, with its similarly colourful structure, the BCN community is a perfect match for Deniz, and being part of it makes her feel at home and excites her to no end with the unlimited number of opportunities it offers for collaboration.

When not busy with science, interacting with students, or working in committees, Deniz likes spending time with her friends, feeding her body with healthy energy by doing yoga, and eating the wide range of wonderful foods her husband cooks.

■ PHOTO: JEROEN VAN KOOTEN

>> CONTINUATION INTRODUCING THE BCN BOARD



Robert Schoevers

Hi there, my name is Robert Schoevers (MD PhD). I am a psychiatrist and epidemiologist with broad clinical experience. My research focuses on the epidemiology, underlying mechanisms and treatment of depressive disorder. It started with a thesis in psychiatric epidemiology looking at onset, course and possibilities for prevention (2005) and then I continued working on treatment as well as epidemiological studies. My personal aim in the coming years is to develop new interventions to conquer depression at different stages of its development, which may range from prevention and early intervention to

treatment of patients with treatment refractory disorder. Combining epidemiological research in studies such as NESDA (www.nesda.nl), TRAILS or LIFELINES with more in depth exploratory studies in patients and controls looking into the underlying pathophysiology may help us develop new treatment options targeting these mechanisms. An example is a study examining the effects of anti-viral drugs on psychosis and (neuro)inflammation. We currently run an RCT on treatment resistant depression using microTMS, and are preparing a study using oral ketamine. In cooperation with the Neuroimaging Centre we examine brain functioning and biomarkers before and after (successful) treatment. We recently started the ilab (www.ilab-psychiatrie.nl) to develop new diagnostic and treatment modalities for affective disorders (2011) through multiple repeated assessments of mood and physiological parameters (eg HPA axis, autonomic nervous system) using catchy mobile devices. We participate in a number of national and international research programs on mood disorders and psychosis. Within the department we work with excellent researchers such as prof. Peter de Jonge (VICI laureate 2011), prof. Andre Aleman (VICI laureate 2011), prof Tineke Oldehinkel, prof. Richard Oude Voshaar, prof Judith Rosmalen and Dr. Eric Ruhé.

We welcome enthusiastic and dedicated future PhD students. If you have questions or research ideas in our field; don't hesitate to contact me!

Publications:

- http://www.ncbi.nlm.nih.gov/pubmed?term=schoevers%20r*%5Bauthor%5D



Addie Johnson

Hi! My name is Addie Johnson (Ph.D. Purdue University, 1993) and I have been Professor of Human Performance and Ergonomics since I joined the Psychology Department of the Behavioural and Social Sciences faculty in January of 2002.

I have been a member of BCN since coming to Groningen and a member of the Board since 2007. In addition to my research on attention and memory I enjoy the challenge of making technology work for people. Human performance and ergonomics is a broad area.

Within my group we work on such diverse topics as interactions between working memory and cognitive control, the effects of coloured light on performance and well being, how emotion influences perception, and how culture influences reports of mental workload. We use performance measures, EEG, TMS, and cognitive modeling to understand human cognition. Much of our work is featured in our new book, *Neuroergonomics: A Cognitive Neuroscience Approach to Human Factors and Ergonomics* (appearing in 2013). This new approach to ergonomics is illustrative of why we need research institutions such as BCN to bring together people from different backgrounds so that technology can maximally benefit from science.

Our academic life would be very different without the collaboration and exchange of ideas with fellow researchers and students from the participating faculties of BCN. I look forward to seeing BCN members at the various meetings of this jubilee year – and to hearing more about Ph.D. student projects as a teacher in the Project Management course.

Introducing the BCN Office



Diana Koopmans

Diana has now been working at the BCN office for quite a long time. She has survived 5 research coordinators, 4 BCN directors, 4 different workplaces, and more importantly, over 600 PhD students. Working with these PhD students is what makes her work so interesting. She enjoys the contact with ambitious young people who are at the beginning of their careers. Like all BCN Office members, she likes to guide them through their PhD studies. Most PhD students know her from the introductory talks they have with her at the beginning of their projects. She organizes a number of courses and keeps them informed about general issues, and is the person to contact with questions about the PhD training programme, courses, financial support or appointments. Besides work, Diana enjoys eating out, and her hobbies include jewelry making, reading and going on city trips.



Evelyn Kuiper-Drenth

My name is Evelyn Kuiper-Drenth. Some of you know me, but most of you probably only know me by name (from all the e-mails I send :)). "I have been working at UMCG since 2001. I started as a secretary at the Department of Pulmonology. In November 2008 I changed jobs and started to work as a secretary for BCN three days a week. As a part of my job, I write the minutes for the BCN board meetings and the BCN Education Committee meetings. I also joined the BCN newsletter team from the moment I started working for BCN, and I still enjoy being involved in this. Unfortunately I do not see that many BCN members, but a good occasion is the BCN New Year's meeting where I help Diana and Janine. And you might have seen me at the BCN Jubilee Symposium last November. Besides work I like spending time with my son, playing tennis, being active in Total Fit. If you have any questions, please do not hesitate to contact me, and you are always welcome to stop by.



Janine Wieringa

Janine has been working at the BCN office since 2005. She is responsible for organizing several courses for BCN, like the Retreat and the Project Management course, as well as meetings like the New Year's Meeting and the BCN Symposium. Additionally, she handles the registration of activities for the PhD students. She enjoys working at BCN mostly because of the nice colleagues, and also for the pleasant contacts she enjoys with BCN members and PhD students. In her free time, Janine tries to keep her vegetable garden as neat as possible, and loves to cook. When she has time to spare, you'll find her painting portraits and nature scenes using several techniques.

■ PHOTOS: SANDER MARTENS



BCN PhD council

The BCN PhD council represents all BCN PhD students and promotes their interests at BCN Education Committee (EC) meetings. This includes keeping a keen eye on the quality of the educational programme, as well as improving and increasing communication between the BCN board and PhD students. We also represent BCN-BRAIN PhD students in the PhD council and EC of GSMS (Graduate School of Medical Sciences), where BCN-BRAIN fuses with the three other medical graduate schools.

We use questionnaires to get an idea about the problems BCN PhD students are facing so we can try to solve them. We also encourage you to contact us if you have a problem you think we can help you with. Furthermore, we organize several social events, such as the sports day, the BCN PhD day, the first-years BBQ and BCN drinks. To keep you all up to date about interesting events for BCN PhD students, we have the following blog: bcnphdcouncil.blogspot.nl. You can also contact us at bcnphdcouncil@list.rug.nl.

At the moment, the BCN PhD council consists of the following members:

- Erin van Buel, Department of Molecular Neurobiology
- Amarins Heeringa, Department of Ear, Nose, and Throat – Head and Neck Surgery
- Barbara Nordhjem, Laboratory of Experimental Ophthalmology, Neuroimaging Center
- Vladimir Shalgunov, Department of Nuclear Medicine and Molecular Imaging
- Kashmiri Stec, Department of Communication & Information Sciences
- David Vallez, Department of Nuclear Medicine and Molecular Imaging
- Funda Yildirim, Laboratory of Experimental Ophthalmology, Neuroimaging Center



Erin van Buel

I earned a Bachelor's in Medicine from the University of Groningen. While doing my internships in medicine, I found I would rather like to focus on a science than a medical profession. Since many people tell me I have always been "brainy", I naturally enrolled in the BCN Research Master's programme in 2008. After graduating, I joined the Molecular Neurobiology group to pursue a PhD on the biological mechanisms underlying the clinical effects of electroconvulsive therapy in Major Depressive Disorder. As of November 2012, I have joined the BCN PhD Council, foremost because I find the quality of our education programme important – and I don't mind spending some of my free time on it. Also, I think that the interaction between candidates from different research groups should be encouraged. Of course, being the only council member working at the Center for Life Sciences, I also hope to represent this group's members especially.



Amarins Heeringa

I grew up in the Netherlands and studied here at the University of Groningen, where I did my Bachelor's in Life Science & Technology. After receiving my BSc., I decided to go traveling and working for a year before starting a master's programme. My interest in neuroscience motivated me to apply for the N-track of the BCN Research Master at the RuG. After my graduation in 2010, I started my PhD project in the Department of Otorhinolaryngology at UMCG, where tinnitus, also known as 'ringing in the ears', is one of the research topics. The subject of my project is neural correlates of tinnitus, which I study using a neurophysiological animal model. The aim is to find a fingerprint in spontaneous and acoustically evoked neural activity that is specific for the presence of tinnitus. Even though the topic I study is more focused now, my interest in neuroscience is still very broad, which is also why I enjoy being part of BCN. By being a

>> CONTINUATION BCN PHD COUNCIL

member of the PhD council, we are in a position to bring BCN PhD students together by organizing social and educational events. We will keep you posted and then hopefully see you there!



Barbara Nordhjem

After years of studying psychology amongst Freudians and bitter cognitivists, I decided to go on a different kind of mind trip. I emerged myself in video software, flickering lights and strange sounds. I worked as a coordinator for several projects related to art and media technology, and created my own installations as well. My trip then continued deep into the brain, and I studied cognitive neuroscience at Leiden University. I also interned with neuroesthetics pioneer Semir Zeki at University College London where I did my thesis project about how ambiguous figures are processed in the brain. I graduated in 2011 with a master degree in Cognitive Neuroscience from the University of Leiden. Now, I am a PhD researcher in the Visual Neuroscience Group at UMCG. I am exploring the possibility of several parallel streams of information in the brain which are

> *It's a great way to get insider-tips and stay informed* <

used for visual recognition. I combine knowledge and tools from psychology, neuroimaging, computer vision and image processing. My research methods include behavioural testing, fMRI and eye movements. I joined the BCN council because I find it important that there are events where PhDs can get together and share skills and experiences. Also, I like to participate in creating a good research environment.



Vladimir Shalgunov

I came to Groningen in 2009 after finishing my Master's programme at the Shemyakin-Ovchinnikov Institute for Bio-Organic Chemistry in Moscow, where I was involved in peptide synthesis and antibody production. Currently I am working on my PhD project at the Department of Nuclear Medicine and Molecular Imaging at the UMCG. Here we use radioactive compounds to make physiological processes in the human body visible. The aim of my work is to find compounds that will visualize particular receptor species in the brain and will be suitable for mass production and thus widespread use in clinical diagnostics or neuroscience. Because I

wanted to know how graduate schools function and how PhD self-organization works, in the beginning of 2011 I joined the PhD council of the BCN. Recently I have also been delegated to represent BCN in the GSMS PhD Council.



Kashmiri Stec

With family living on three continents, I grew up and studied a bit everywhere. Before coming to Groningen, I did a Bachelor's in Linguistics at U.C. Berkeley (US), post-graduate diplomas in Sanskrit and Indian Philosophy at Banaras Hindu University (India), a Master's degree in Cognitive Semiotics at Aarhus University (Denmark), and now am working on a PhD in the Department of Communication and Information Sciences at the RuG.

I have pretty wide "communicative" interests, and have worked on projects ranging from the natural language processing algorithms behind Bing to the translation of "lost" Sanskrit texts from Nepal. My current research focuses on the way people organize the space around themselves as they talk, and looks specifically at

>> CONTINUATION BCN PHD COUNCIL

different kinds of non-verbal behaviours accompanying quotative utterances.

I was thrilled to discover I could join BCN when I started my PhD project here. I joined the BCN Newsletter staff as Copy Editor in 2011, and the BCN PhD Council in late 2012, in order to be more involved with the local scientific community. It's a great way to get insider-tips and stay informed, and an even better way to make friends and learn from diverse perspectives.



David Vázquez

I am doing the PhD in the Department of Nuclear Medicine and Molecular Imaging. I did my Bachelor's in Physiotherapy, later worked in my own practice, and finally completed a Master in Clinical Psychoneuroimmunology, which brought me here. With this unusual background experience, I expect to give new insights to the neuroimaging knowledge of late symptoms after a mild traumatic brain injury or whiplash trauma, which are my research topics. Since I started my studies in the University of Alcalá de

Henares (Spain), I have always been involved with the student councils, and later with different professional associations of physiotherapy. I am always trying to help the collective that I belong to, and that is why I've been a member of the BCN PhD Council since my second year.



Funda Yıldırım

I moved to Groningen from Turkey over a year ago to start my PhD in the Visual Perception Lab. I enjoy investigating how people filter useful information out of so many complex visual inputs in their daily lives. I am especially interested in how our visual system works when we do not focus on certain objects located in the periphery of our vision. Along with the BCN and GSMS course-load, and striving to publish my work in the beginning of my research career, I like to be a part of the BCN and GSMS families by being involved in their PhD councils. In this way, I get to have a chance to express how PhD students feel about the happenings in the institutes and what kind of changes we would like to see. It is always very nice to actively contribute to our own environment, and helping to produce innovative ideas.

Introducing a new staff writer

> ANDREA SOTO



I am a first year master student in the Clinical and Molecular Neuroscience track of the BCN master course. Before coming to Groningen, I studied Medicine at Mexico's National University, and graduated as a proud MD after some years spent at hospitals and many practices. In the third year of my career, during a year of social service at the (Mexican) National Institute of Neurology where I worked on a project with varicella zoster virus and multiple sclerosis, I realized I liked neuroscience. All of this helped me come to Groningen and join the BCN master programme, something I had wanted to do for a couple of years before actually arriving here. During my time at university I was part of many student groups, organized some student congresses and represented my classmates for four years. I also play the piano and consider swimming one of my favorite activities. I hope the experience in this newsletter allows me to explore other abilities, to grow as a person and to unleash my curiosity a little bit more.

■ PHOTO: ARMANDO ERNESTO SÁNCHEZ

Why the buddy system?

About a year ago, BCN introduced a buddy system into its PhD programme: New BCN PhD's are asked if they would like to have a buddy, and, if so, are paired with one. This buddy, who has been in BCN for two years or more, is there to answer any question you might run into during the first part of the PhD project. Since its start, several buddy pairs have been formed. Recently, a mentor system has also been introduced which groups two or more first year PhD students to one older PhD student.

To give you a good overview on how this system works and why it is beneficial, we interviewed the buddy pair Ryan Taylor and Kashmiri Stec. About two years ago, when Kashmiri came to Groningen to start her PhD at the Center for Language and Cognition Groningen (CLCG), she was 'buddied up' with Ryan, who had already been working at the CLCG for two years. Because Ryan is currently living in Mexico, we met over the internet.



Can you introduce yourself briefly?

KASHMIRI: I'm now in the second year of my project, in which I look at how people use their bodies to communicate. I'm half-American and half-Polish. I grew up in the US, but have also lived in Denmark and India.

RYAN: I am originally from western Canada. Before starting my PhD at Groningen, I did a European Master's programme here.

So Kashmiri, it was not the first time for you integrating into a new country?

KASHMIRI: No, and it was also not the first time I had to deal with a new education system and different kinds of bureaucracy.

RYAN: It's funny, because sometimes people would ask me about Canadian bureaucracy, but the bureaucracy in your own country is always, at least somewhat, transparent to you.

KASHMIRI: Yeah, you just know where to go to ask for different kinds of information, and in a different country it's always a completely different organisation.

Do you think it is important for a buddy/mentor that they also had the experience of coming from another country to Groningen in order to help a PhD student who did?

KASHMIRI: I think so, yes.

RYAN: Often the people in the university administration who help with various things have a good idea about where to go for what and are often very helpful. But, to talk to somebody who just went through entirely the same thing a year or two ago is very useful. Not only do they know, but you can also complain a bit about your frustrations.

How did you find out about the buddy system of BCN?

KASHMIRI: When I met Diana for the introductory meeting, I asked her if there was such a system. When I was in Denmark before as a master's student, they had a buddy system arranged for all the international students. That was really useful, because in Denmark there are

> *It did really start us talking* <

a lot of forms and many more places where you have to go to register and say: Hey, I'm here. So they have somebody to walk you to all of the different offices and give you a tour of the university. I really liked that system and so, when I came here, I hoped that the same system was in place.

RYAN: I think that I'd heard about it when Diana Koopmans said there is someone who is interested in having a buddy, would you like to take part, and I said: Well, sure.

KASHMIRI: No pressure, Ryan :-)

RYAN: Well, it didn't hurt that I already knew Kashi at the time.

KASHMIRI: Our offices were in the same building, so we had already run into each other.

>> CONTINUATION WHY THE BUDDY SYSTEM?

Did you consider it an advantage, that you came from the same departments?

RYAN: I think the buddy system works best if it is somebody that you would get along with, who has a situation similar to yours, but is a couple of years ahead of you. I think that it would be helpful to be with somebody who was from exactly the same situation as yours. For example, we have first year reports and these sorts of things that are specific to the CLCG. And if Kashi had had questions about it, then I would be able to say, this is what is written and this is what is actually expected. But I also think that if there was nobody that was in the same group, it still would have been helpful.

> I found housing very difficult in the Netherlands <

And in your case, what were the reasons for you to say yes to Diana's request to become a buddy for Kashmiri?

RYAN: I think it is nice to be helpful and it also ended up being good because it is just generally good to have somebody to talk with about your project.

KASHMIRI: And then it was nice that we were in the same building, because that made it really easy to just walk down the hall and say: Hey, do you have a couple of minutes?

So in the end it was more of a two-way conversation?

RYAN: Yes, definitely.

KASHMIRI: It obviously started out with me asking Ryan a lot of questions about different kinds of bureaucracy and official procedures. Once we got over those details, we could talk more about our projects and geek out about science.

How did the first meeting take place?

KASHMIRI: I think it was a coffee date. Did we go to Simon Levelt or something like that?

RYAN: Yeah, I think maybe we did that, we were in the same building so it could have been the next time we stood in the kitchen that we said: Oh, so now we are actually buddies.

KASHMIRI: But at that point we knew that we both existed, so it's not like we had a real sit-down conversation. And having this kind of buddy framework made it really easy for me to start asking him difficult questions, or just to get to know each other.

RYAN: And I also think that I would have been a bit hesitant before walking up to somebody that I only knew from meeting in the kitchen, just walking up to that person and going on and on about bureaucratic problems. In our case, I did volunteer for that, so she didn't have to feel bad about it.

KASHMIRI: In the end, we were meeting pretty regularly, like once a week or once a fortnight or so. I mean we also really became friends right? So it was not like we had this buddy system hanging over us. But it did really start us talking.

So next to discussing new bureaucracy, what were the other things you typically discussed when you came together?

RYAN: She had figured out housing already, but that is definitely the kind of thing that a buddy could be helpful with, I found housing very difficult in the Netherlands.

KASHMIRI: Also, differences in academic cultures in different places. And different kind of science questions. Like, I know one part of cognitive science really well, and Ryan knows another part of cognitive science really well. So there was a lot of complementary information that we could give each other, and a lot of overlap. And that slightly different perspective was also really nice, considering my own project.

RYAN: I think in the end it fits with the interdisciplinary perspective of BCN. A lot of the events are trying to get people in a less formal environment talking about their project and that's what it became.

Ryan, what do you think the advantages of being a buddy are, and would you recommend it to other BCN PhD students?

RYAN: I've been redoing my CV lately and I can say "I've done these things academically". But something that is important for them to know is that you also have some kind of social skills. And to put a little line on the CV that says that you helped somebody as a mentor makes it seem that it's less likely that you're Sheldon from the Big Bang Theory. I would definitely recommend being a buddy for someone to other BCN PhD students. I think it's not as much work as you would think, or even very much work at all. And you're able to help somebody a lot. It was even valuable scientifically.

And Kashmiri, what is the best advice or tip that you got from your buddy?

KASHMIRI: I don't think that's a one-line answer. It's not like one question or opportunity really made the difference, it's more that I knew that any time I had any type of question, even like a complaint about some article I had just read, that I could go to Ryan and I could ask him about it, and he was there and would have the time. And if he didn't have the time right then that afternoon, then I knew that in a few days he would have the time and we would have a chat. And knowing that somebody is there and curious and also a bit involved in looking out for you, it makes life a lot easier. I would definitely recommend other new PhD students get a buddy for starting up.

Are you now a buddy for someone else?

KASHMIRI: There's a bit of a different system now, something called buddy mentor groups, and there are seven people in it, with me as a mentor. Only two of them sounded like they were interested in meeting, so we will see each other next week.

Ryan and Kashmiri became good friends and are still in regular contact with each other. We hope that, with this story, we gave BCN an idea about the value of the buddy system. If you are in your first year and also want a buddy or a mentor, or if you want to be a buddy for someone else, you can contact Diana Koopmans (d.h.koopmans@umcg.nl).

■ AMARINS HEERINGA



The (less) bright side of being a PhD student in the Netherlands



> PhD candidates don't always have a clear career vision <

The Promovendi Netwerk Nederland (PNN) organised a meeting between PhD candidates across the Netherlands and several high profile speakers including professors and politicians. The newly appointed director of the Royal Dutch Academy of Science, Professor Hans Clevers, opened the meeting. During his speech, he pointed out some positive and negative sides to being a PhD candidate in the Netherlands. On the bright side, (Dutch) PhDs are generally independent, critical and hand in high quality theses. Due to these positive traits, Dutch postdoc fellows are highly valued by research groups abroad, particularly in the United States. Moreover, PhDs receive a financial compensation during their training and are able to build a pension. This is fortunate as it's not always the case abroad.

On the negative side, the Dutch academic field offers few permanent positions. As a consequence, the competition is tough and one has

to struggle to reach the top. You have to realise, he said, that if you are not a top researcher, your future prospects are not very bright. He noted, however, that PhD candidates don't always have a clear career vision. In some instances, they do not even choose the best research group for their doctoral studies, and unwillingly hurt their chances of success. In this aspect, there is a lot to be learned from PhDs in the United States. In general, American PhDs are more tactical and future oriented. Importantly, they carefully choose the research group they are going to join during their graduate studies. In contrast to the Netherlands, the concept of research group or 'lab' is very popular in the United States. This is because lab leaders, such as professors and principal investigators, take an active part in the education of future PhD students. For instance, all famous professors in Harvard are required to give classes in the undergraduate program. Hence, the American student is given an early introduction

to the labs that produce high-quality scientific research. According to Clevers, the majority of lecturers in Dutch Universities are either not very active in research or not high profile researchers. Dutch students, therefore, are not well acquainted with top research in their country.

Additionally, Clevers pointed out that there was a lot of room for improvement in the supervision of PhD students. In this particular point, Clevers was seconded by one of the founders of PNN, Jaap Timmer, working at the Vrije Universiteit Amsterdam. To paraphrase Timmer, some professors are just not good at supervising their PhDs. During his 12-year-long academic career, Timmer witnessed about 10 PhD candidates being carried outside by medical staff due to nervous breakdowns. That was because of the professor, he said! Even more alarming is the fact that even these extreme cases go unpunished. In the last part of the meeting, three representatives from the parliament or 'Tweede Kamer'

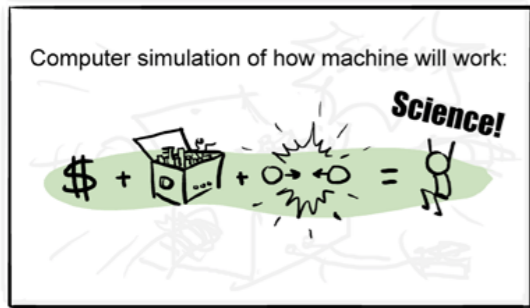
engaged in a discussion about Doctoral education policy: Annewil Lucas (VVD), Jasper van Dijk (SP), and Tanja Jadnanansing (PvdA). Each representative briefly described their party's position. For example, Annewil Lucas (VVD) told us about striving to get private enterprise to fund research. The audience was largely on her side, showing some sort of desperation on the side of the PhD students to get easier access to research funds. Nevertheless, some students, including the GRIN/BCN delegation, expressed concerns regarding unhealthy dependencies which may lead to important findings not being published because of the wishes of a sponsor. The majority of the PhDs present, however, were optimistic that the private sector would approach scientific research ethically.

■ BY EMI SALIASI AND JONATHAN MALL
 ■ PHOTOS: FRANCOIS MALAN

KICKJUMPER!

SUPER SCIENCE MACHINE!

GOAL: \$20,000,000,000



SUMMARY

This project is to build a really big machine that will make awesome science. It will accelerate and/or trap/detect some kind of sub-atomic particles really fast and smash them together with huge giant lasers made using nano-technology, quantum computers, artificial intelligence, nano-information and... ROBOTS! (some of them will be NANO-robots).

IMPACT

This will test fundamental hypotheses about the nature of everything, change your outlook forever and how the human species thinks about itself and most stuff at a deep, profound, totally "whoa!" level. Eventually, it may lead to the understanding of elemental relationships that explain certain general phenomena which could result in the creation of processes that might be adapted to perhaps develop technology that could possibly be somehow practically implemented on things to make your life easier (or save it, you never know) but that you will totally take for granted.

STRETCH GOALS!

If we are fortunate enough to exceed our funding goal, here are some additional goals:

\$24 Billion: We build this... in *SPACE!!*

\$31 Billion: Everyone gets a commemorative *NANO-ROBOT!*

\$44 Billion: Actually, this is what the machine will cost in the end due to budget overruns.

Frequently Asked Questions

Q: Will you blow up the Earth when you turn the machine on?
A: No, that is theoretically impossible according to our theory.

Q: Will this bring about affordable jetpacks and/or flying cars?
A: Oooh, maaaaybee...

Q: Can I press the button?
A: Ok.

Report this project to KickJumper

7

BACKERS

\$9

PLEGDED OF \$20,000,000,000 GOAL

33

DAYS TO GO

REWARDS!

Depending on how much you give, you will receive these awesome rewards:

\$1 or more

You will get a limited edition sticker.

\$20 or more

You will get a limited edition sticker and a copy of the first paper published with preliminary results, signed by all 3500 authors!

\$1000 or more

Someone will come to your house and explain to you what we're doing.

\$3 Million or more

Institutional Sponsorship: Professors from your school can come hang out and say they're part of the team.

\$200 Million or more

Country Sponsorship: Everyone living in your country will get first dibs at entering any new dimensions that may or may not be opened due to the operation of the machine.

\$2 Billion or more

We'll name a particle after you or your Trademarked Corporate Identity. Limited to however many new particles we find.

WWW.PHDCOMICS.COM

Introducing a new staff writer

> LIWEN ZHANG



I am a PhD student in the Neuroimaging Center at the University Medical Center Groningen. Before I came here, I studied Applied Psychology and Basic Psychology during my bachelor's and master's programmes in China. During my studies, I became interested in clinical research, which brought me to this beautiful 'rainbow country'. I started my PhD project in October last year. My research focuses on insight in affective and non-affective psychosis. I will compare schizophrenia and bipolar disorder using fMRI. Just a few days ago, I got an opportunity to join the BCN newsletter team. This is definitely a good chance for me to practice my English and social skills, which may help me to adapt better here.

PHOTO: SANDER MARTENS



> *Very geeky, but fascinating stuff*

> ALUMNI COLUMN

There and back again

Trying to think back to when, how, and why I started a PhD the best answer is probably ‘it seemed like a good idea’. After a study in Computer Science in Twente and a masters project with Richard Kamman at the Department of Radiology in the University Medical Centre Groningen, I decided that I liked doing research, and had heard about a PhD project with Jos Roerdink at the Department of Computing Sciences. The decision was made over a cup of coffee at the ACLO.

The subject of the project was the use of wavelets in functional MRI data analysis. Reading it now, it sounds like a lot to take on – I had worked with MRI and was working at the PET Centre at the time, but I had never worked with fMRI. But then I had used wavelets before and I was (and still am) amazed by what they do: analysing a function at different scales at once, while still showing its shape in the original domain (space or time), at very low computational and storage cost. Very geeky, but fascinating stuff.

And then near the end of the project, one of the fMRI-related mailing lists advertised a job for a postdoc in Cambridge: a research associate position in fMRI time series analysis, experience with wavelets was preferred. Again, it sounds intimidating when reading it back – not least of all because of its location – but again, it seemed worth a try. It quickly became serious when they came back with a job offer. Within weeks I was flying to the UK for a job interview, one of

the last RyanAir flights from Eelde Airport.

The postdoc in Cambridge was a fantastic experience. I worked at the Brain Mapping Unit, whose director Ed Bullmore was always interested in different wavelet-based analyses of neuroimaging data. One of the main themes I worked on is the fractal nature of fMRI time signals. Here the word ‘fractal’ means that a signal has the same structural properties when it is observed at different scales of magnification. Using wavelet analysis, we could estimate these properties very precisely, and compare them between different sets of fMRI data. Another exciting project, even if it was not the most scientifically challenging, was re-writing the in-house image analysis software so that it would support the then-new NIFTI file format, its code was faster, more readable and reusable, and new analyses were included.

Life in Cambridge was great, and in more than one way similar to life in Groningen: Cambridge is a relatively small city whose university has a massive influence on its population, culture, politics, etc. Going out after work with colleagues is a much bigger thing in the UK than it is in the Netherlands, and the social life in Cambridge was generally brilliant. More importantly, it’s where I met my wife Khanum, and many friends, most of whom I still see from time to time.

After about two and a half years, changes in the job market had us move to London, where I started working as an fMRI scientist. No wavelets

this time; my main project was the integration of fMRI image slice alignment and estimating the amount of contrast in activated regions. Assuming that slices in a volume can move independently (which they can, since they are scanned sequentially), estimating the activation becomes a lot more complex. After re-ordering the computations, the time and memory requirements were so much lower that we could run this integrated analysis on a desktop computer.

And then, amazingly, as it was time to start looking for jobs again, the VU University Medical Centre in Amsterdam had a position for a senior researcher, to work on integrated analysis of multi-modal brain image data: finding a way to analyse combinations of (f)MRI, PET, DTI, and (M/E)EG data. This is a great challenge, and work is fantastic: writing software, running analyses, lots of collaborations and supervisions with people from different disciplines. And in the meantime, trying to set up a research group to develop this theme.

So at the moment I am back in the motherland, living in Amstelveen, getting reacquainted with Dutch life. It’s funny to look back at all these big decisions, which could be made in the blink of an eye but change one’s life forever. I am sure there will be more to come, and I wish all of you good luck with yours!

■ BY ALLE MEIJE WINK



> ORATIONS

PET-radiochemie, de haute cuisine van de nucleaire geneeskunde

ORATIE

P.H. Elsinga

TITEL

PET-radiochemie, de haute cuisine van de nucleaire geneeskunde

LEEROPDRACHT

Radiochemie, i.h.b. voor positron emissie tomografie

DATUM

3 december 2012

Prof.dr. Philip Elsinga beschrijft in zijn oratie de drie pijlers van de PET-radiochemie. De bereiding van PET-radiofarmaca binnen de Nucleaire Geneeskunde is te vergelijken met het werk in de keuken van een restaurant, stelt Elsinga. Radiochemici werken als koks aan de bereiding van radiofarmaca. Voor het optimaal uitoefenen van het werk zijn daarbij drie pijlers van belang: onderzoek (het ontwikkelen van nieuwe gerechten), onderwijs en scholing (het opleiden van de koks) en patiëntenzorg (de optimale bereiding van de gerechten op de menulijst).

Op het gebied van onderzoek zal de komende jaren worden ingespeeld op de zeer grote behoefte aan meer variatie van klinisch gevalideerde radiofarmaca om ziekteprocessen in kaart te kunnen brengen. Hiertoe worden innovatieve PET-radiochemische bereidingsmethoden onderzocht zoals:

clickchemie voor PET-MRI-probes, multicomponent reacties en microfluidics. De onderwijsambities liggen op het vlak van colleges aan studenten chemie, het opleiden van radiochemici en de bij- en nascholing van specialisten. Bij patiëntenzorg zal worden ingezet op productie van PET-radiofarmaca op een kwalitatief hoogstaande manier, volgens GMP-richtlijnen. Regelgeving met betrekking tot de productie van radiofarmaca staat ter discussie en zal moeten worden aangepast om innovatie binnen de Nucleaire Geneeskunde niet af te remmen.

Om de drie kerncompetenties onderzoek, onderwijs en patiëntenzorg op het gebied van de PET-radiochemie te bundelen, lanceert Elsinga het specialisme klinisch radiochemicus. Naast het opleiden van radiochemici en het stimuleren van radiochemisch onderzoek, is samenspraak met de ziekenhuisapotheker essentieel voor een optimale kwaliteit van PET-radiofarmacabereiding. Op die manier wordt PET-radiochemie naar het niveau van haute cuisine getild.

Je ziet het pas als je het herkent

ORATIE

M.A.J. de Koning-Thijssen

TITEL

Je ziet het pas als je het herkent

LEEROPDRACHT

Neurologische bewegingsstoornissen

DATUM

4 december 2012

Neurologische bewegingsstoornissen worden onderverdeeld in hypokinesie, waarbij er te weinig bewogen wordt, en hyperkinesie, zoals tremor, dystonie, myoclonus en tics, waarbij er juist teveel bewogen wordt. Het is belangrijk dat bewegingsstoornissen herkend worden door artsen, omdat goede classificatie leidt tot adequate diagnostiek en behandeling van de onderliggende stoornis, stelt prof.dr. Marina de Koning-Tijssen in haar oratie.

Hyperkinetische bewegingsstoornissen komen op elke leeftijd voor. Naast de volwassen patiënten melden zich op een nieuw multidisciplinair spreekuur (neuroloog, kinderneuroloog, kinderarts en klinisch geneticus) ook kinderen en jongvolwassenen voor diagnostiek en behandeling. Daarnaast vindt genetisch wetenschappelijk onderzoek plaats, gericht op de ontdekking van nieuwe genen. Voor de behandeling van ernstige dystonie bij kinderen komt stereotactische operatie in aanmerking. Daarbij worden er elektroden in de hersenen, de globus pallidus internus, geïmplant. Het effect bij kinderen

is aanzienlijk op de dystonie, maar heeft vooral ook invloed op de kwaliteit van leven. Patiënten met bewegingsstoornissen hebben vaak psychiatrische klachten en vice versa. Patiënten met de ziekte van Parkinson hebben vaak depressies, patiënten met dystonie angststoornissen. Bij functionele of lichamelijk onverklaarde klachten komen bewegingsstoornissen voor. Voor patiënten is het vaak of het één of het ander. 'Dokter, ik ben toch niet gek?' De invloed van dualisme-filosoof Descartes met het strenge onderscheid tussen lichaam en geest komt hierin terug. De Koning-Tijssen houdt een pleidooi om het strikte onderscheid tussen neurologische en psychiatrische ziekten binnen de bewegingsstoornissen te verlaten. Emotionele stoornissen in de psyche zijn net als motorische stoornissen gebaseerd op dysfuncties van de hersenen. Anderzijds worden verschillende neurologische stoornissen beïnvloed door psychologische en sociale factoren.

Goede motorische en psychiatrische fenotypering gecombineerd met nieuwe ontwikkelingen op het gebied van de erfelijkheid, beeldvorming en klinisch neurofysiologisch onderzoek gaat de komende jaren leiden tot meer inzicht in bewegingsstoornissen en de ontwikkeling van nieuwe diagnostische testen en behandelmogelijkheden.

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

> PROMOTIONS

Cerebral oxygenation in newborn infants at risk

P R O M O V E N D U S

E.A. Verhagen

P R O E F S C H R I F T

Cerebral oxygenation in newborn infants at risk

P R O M O T O R

Prof.dr. A.F. Bos

tot gevolg hebben. Elise Verhagen onderzocht het zuurstofgehalte in de hersenen van te vroeg geboren baby's en de precieze gevolgen ervan. De gebruikte onderzoeksmethode, near-infrared spectroscopy (NIRS), lijkt een bruikbare methode te zijn om een verstoorde zuurstofvoorziening in de hersenen van te vroeg geboren baby's vast te stellen.

Verhagen vond nieuwe aanwijzingen dat roken tijdens de zwangerschap slecht is voor de zuurstofvoorziening van de hersenen van de pasgeboren baby. Daarmee biedt het onderzoek een nieuwe, extra reden om vrouwen

dringend te adviseren te stoppen met roken voor zij zwanger raken, of in ieder geval direct te stoppen met roken zodra ze weten dat ze zwanger zijn.

Roken tijdens de zwangerschap leidt tot een hogere zuurstofextractie in de hersenen bij te vroeg geboren baby's in de eerste dagen na de geboorte, zo stelt Verhagen vast. Een hogere zuurstofextractie kan een aanwijzing zijn van een te lage bloeddorstrooming van de hersenen.

De promovenda concludeert tevens dat het zuurstofgehalte in de hersenen tijdens de eerste dagen na de geboorte bij te vroeg geboren baby's is geassocieerd met de neurologische ontwikkeling op 2- tot 3-jarige leeftijd. Relatief hoge en lage waarden zijn gerelateerd aan een slechtere cognitie. Een hoge zuurstofextractie is gerelateerd aan een slechtere motorische uitkomst.

Elise Verhagen (Gouda, 1984) studeerde Geneeskunde te Groningen. Ze verrichtte haar onderzoek aan de afdeling Neonatologie van het Beatrix Kinderziekenhuis van het Universitair Medisch Centrum Groningen (UMCG) en binnen onderzoeksschool BCN. Zij gaat werken als ANIOS (arts-assistent niet in opleiding tot specialist) in het Reinier de Graaf Gasthuis in Delft. Zij promoveerde op 7 november 2012.

The development of understanding through writing

P R O M O V E N D U S

V.M. Baaijen

P R O E F S C H R I F T

The development of understanding through writing

P R O M O T O R

Prof.dr. D.M. de Glopper

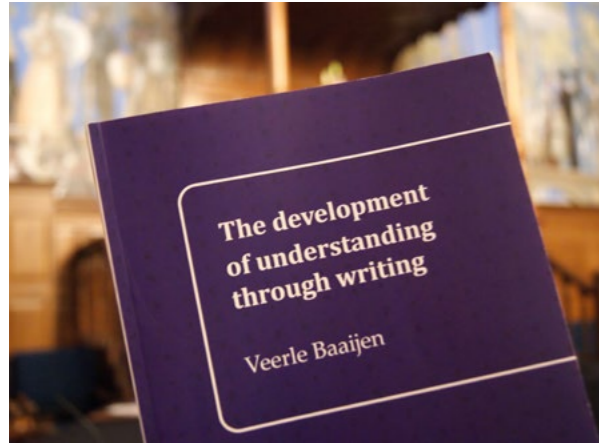
Verband tussen schrijven en leren verder onderzocht

In het proefschrift van Veerle Baaijen staat de vraag centraal op welke wijze schrijven bijdraagt aan leren en aan het ontwikkelen van begrip. Baaijens onderzoek toont aan dat er twee verschillende typen processen een belangrijke rol spelen bij schrijven: expliciete denkprocessen en impliciete taalproductieprocessen. Bovendien laten de resultaten zien dat leren door schrijven en het produceren van een goede tekst niet noodzakelijk samengaan: het produceren van een goede kwaliteit tekst vergt een andere organisatie van de schrijfprocessen dan het ontwikkelen van begrip. Baaijens onderzoek ondersteunt daarmee de belangrijkste claims van het dual process-model van Galbraith. Ze maakt echter ook duidelijk dat het dual process-model van Galbraith verder ontwikkeld moet worden.

Baaijen gebruikt registraties van toetsaanslagen en metingen over de wijze waarop proefpersonen hun ideeën ontwikkelen om



>> CONTINUATION PROMOTIONS



individuele verschillen in begripsontwikkeling te verklaren. Ze onderzocht of verschillen in leereffecten verklaard kunnen worden door de manier waarop de schrijftaak wordt voorbereid en of dit verschilt per type schrijver. Baaijen rapporteert in haar proefschrift over nieuwe bevindingen die potentieel belangrijk zijn voor theorievorming en schrijfonderwijs. De resultaten laten zien hoe uit registraties van toetsaanslagen betekenisvolle metingen afgeleid kunnen worden die inzicht geven in het schrijfproces en hoe begripsontwikkeling afhangt van zowel expliciete denkprocessen als impliciete taalproductieprocessen. Verder blijkt dat de ontwikkeling van begrip systematisch samenhangt met de manier waarop oude en nieuwe ideeën tijdens het schrijven worden geïntroduceerd. Duidelijk wordt ook dat impliciete opvattingen van schrijvers zijn gerelateerd aan tekstkwaliteit. Tot slot laten de resultaten zien dat leren door schrijven en het produceren van een goede tekst niet samengaan: schrijvers geven prioriteit aan één van beide doelen. De conclusie van Baaijen is dat er een dual-process model vereist is om de leereffecten van schrijven te kunnen verklaren.

Veerle Baaijen (Den Haag, 1982) deed de research master Linguistics aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek bij het Center for Language and Cognition Groningen, aan de Faculteit der Letteren. Baaijen werkt als docent bij de afdeling Taalbeheersing en bij de afdeling Communicatie- en Informatiewetenschappen aan de RUG. Zij promoveerde op 22 november 2012.

Soccer tactics. Dynamics of small-sided games and full-sized matches

P R O M O V E N D U S

W.G.P. Frencken

P R O E F S C H R I F T

Soccer tactics. Dynamics of small-sided games and full-sized matches

P R O M O T O R

Prof.dr. C. Visscher

Tactiek is meetbaar

Prestatieanalyse is het objectief vastleggen en evalueren van gedragingen van één of meer spelers tijdens wedstrijden of trainingen. Het belangrijkste doel is coaches en spelers te voorzien van biomechanische, technische, fysiologische en tactische informatie over speler- en/of teamprestatie. Hiermee is de training te sturen, de prestatie te verbeteren of de wedstrijdvoorbereiding te ondersteunen.

Wouter Frencken heeft een serie studies uitgevoerd bij jeugdige-, volwassen-, amateur- en elite-voetballers, om inzicht te

krijgen in tactische prestatie-indicatoren tijdens kleine partijtjes zoals 4 tegen 4 en echte wedstrijden. Middels positiedata (x,y-coördinaten verkregen met tracking-systemen) van spelers zijn onder anderen patroonveranderingen in de afstand tussen twee teams en in oppervlaktes van twee teams geanalyseerd. Daarnaast zijn de afmetingen van het veld gemanipuleerd om patroonveranderingen te analyseren en zijn doelpogingen en doelpunten voorspeld aan de hand van veranderingen in tactische prestatie-indicatoren.

Frencken laat met dit onderzoek zien dat tactische patronen met positiedata inzichtelijk gemaakt kunnen worden. Verder laat hij zien dat oppervlaktes, middelpunten en afstanden tussen teams het proces van aanvallen en verdedigen beschrijven. Uit zijn onderzoek blijkt dat veldafmetingen tactische patronen beïnvloeden en dat een deel van de doelpogingen en doelpunten voorafgegaan wordt door veranderingen in tactische prestatie-indicatoren in kleine partijtjes en wedstrijden.

Wouter Frencken (Tilburg, 1982) studeerde gezondheidswetenschappen (bewegingswetenschappen) aan de Universiteit Maastricht. Hij verrichtte zijn promotieonderzoek bij het Centrum voor Bewegingswetenschappen van het UMCG en de Graduate School for Behavioural and Cognitive Neurosciences (BCN) van de RUG/UMCG. Momenteel werkt hij als docent/onderzoeker bij het Hanze Instituut voor Sportstudies en als sportwetenschapper bij FC Groningen. Hij promoveerde op 26 november 2012.



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Pronoun Processing. Computational, behavioral, and psychophysiological studies in children and adults

P R O M O V E N D U S

J.C. van Rij-Tange

P R O E F S C H R I F T

Pronoun Processing. Computational, behavioral, and psychophysiological studies in children and adults

P R O M O T O R

Prof.dr. C. Visscher

Waarom kinderen stoeien met persoonlijke voornaamwoorden

In de frase 'Gisteren sprak James met Rob. Hij bekende de diefstal.' kan zowel James als Rob de bekende dief zijn. De oorzaak van deze ambiguïteit is dat persoonlijke voornaamwoorden zoals hij en hem geen vaste betekenis hebben, maar dat hun betekenis afhankelijk is van de context. Jacolien van Rij onderzocht waarom persoonlijke voornaamwoorden eenvoudig lijken voor volwassenen, maar moeilijk zijn voor kinderen.

Verschiede factoren spelen een rol bij de interpretatie van voornaamwoorden, waaronder de structuur van de voorafgaande zin. Volwassenen weten meestal meteen naar wie het voornaamwoord verwijst, maar kinderen interpreteren een voornaamwoord vaak anders dan bedoeld door de spreker. Jacolien van Rij onderzocht waarom persoonlijke voornaamwoorden eenvoudig lijken voor volwassenen, maar moeilijk voor kinderen. Om deze vraag te beantwoorden ontwikkelde Van Rij computermodellen die het

produceren en interpreteren van persoonlijke voornaamwoorden nabootsen. Deze modellen testte ze in verschillende experimenten met kinderen en volwassenen.

Van Rij ontdekte dat kinderen zich meer gedroegen als volwassenen en minder fouten maakten met voornaamwoorden wanneer ze vertraagde spraak hoorden. Dit bevestigt het idee dat de verwerkingssnelheid van kinderen onvoldoende is om alle relevante informatie te kunnen gebruiken. Volwassenen gedroegen zich daarentegen meer als kinderen wanneer ze tijdens het interpreteren van een



voornaamwoord een tweede taak moesten uitvoeren, zoals het onthouden van cijfers. Aanvullende studies, waarin hersenactiviteit werd gemeten met EEG en pupilgrootte met eyetracking, suggereren dat het volwassen gebruik van de context afhankelijk is van voldoende werkgeheugencapaciteit. Kortom, de schijnbaar eenvoudige interpretatie van persoonlijke voornaamwoorden is eigenlijk een ingewikkeld proces dat op veel manieren mis kan gaan.

Jacolien van Rij (Middelburg, 1981) studeerde Human-Machine Communication aan de Rijksuniversiteit Groningen. Ze verrichtte haar onderzoek binnen de onderzoeksschool BCN (Research School of Behavioral and Cognitive Neurosciences) en het onderzoeksinstituut CLCG (Center for Language and Cognition Groningen) van de Faculteit der Letteren, in samenwerking met de afdeling Experimentele Psychologie. Van Rij is nu onderzoeker bij het NWO Vici-project Asymmetries in Grammar van prof.dr. Petra Hendriks aan de RUG. Na 1 januari 2013 werkt ze als postdoc aan de Eberhard Karls Universität Tübingen (Duitsland). Zij promoveerde op 29 november 2012.

■ PHOTO: EMMY VAN MULLIGEN

The anatomy of antonymy: a corpus-driven approach

P R O M O V E N D U S

G.V. Lobanova

P R O E F S C H R I F T

The anatomy of antonymy: a corpus-driven approach

P R O M O T O R

Prof.dr. L.C. Verbrugge

Automatisch antoniemen vinden en bestuderen

Het proefschrift van Anna Lobanova behandelt antoniemen (woordparen zoals arm-rijk, dag-nacht, openen-sluiten) en andere paren die onderling een contrast uitdrukken.

Ze richt zich daarbij op twee onderzoeksvragen. Ten eerste bestudeerde ze patroon-gebaseerde methoden om automatisch antoniemen te vinden. Patroon-gebaseerde methoden worden vaak gebruikt om meroniemen (auto-stuur) en hyponiemen (hond-dier) automatisch te identificeren, maar voor antoniemen is deze methode nog niet eerder toegepast. Dit ondanks het feit dat het automatisch identificeren van antoniemen nuttig zou kunnen zijn voor veel toepassingen, zoals het herkennen van ironie en contradicties.

Ten tweede analyseerde ze automatisch gevonden antoniemen en vergeleek die met antoniemen die door theoretisch taalkundigen uitgebreid onderzocht en geclassificeerd zijn. Antoniemen zijn makkelijker te illustreren dan te definiëren. Als gevolg daarvan zijn er al veel verschillende classificaties bedacht. Dit heeft geleid tot meer chaos dan consistentie,

>> CONTINUATION PROMOTIONS

in het bijzonder met betrekking tot andere syntactische categorieën dan bijvoeglijk naamwoorden. De corpus-gebaseerde aanpak die in dit proefschrift wordt gehanteerd, biedt een methodologisch verantwoorde en objectieve manier om tegenstellingen te bestuderen door echte data te gebruiken.

Anna Lobanova studeerde taalkunde aan de UvA. Het onderzoek werd uitgevoerd bij de afdeling Kunstmatige Intelligentie (Computational Linguistics). Zij promoveerde op 30 november 2012.

Uncommon gender. Eyes and brains, native and second language learners & grammatical gender

P R O M O V E N D U S

H. Loerts

P R O E F S C H R I F T

Uncommon gender. Eyes and brains, native and second language learners & grammatical gender

P R O M O T O R

Prof.dr. M.S. Schmid

Nederlandse grammaticale geslachtensysteem heeft functie bij taalverwerking

Het Nederlandse geslachtensysteem, waarbij woorden worden opgedeeld in de- en het-woorden, is extreem moeilijk om te leren. Dit heeft te maken met de scheve verdeling van de- en het-woorden (75% - 25%), de onduidelijke toewijzing van de naamwoorden aan deze twee categorieën ('de kluis', 'het huis') en de onduidelijke grammaticale regels

van het systeem (men zegt bijvoorbeeld 'het mooie paard', maar 'een mooi paard'). Gebruikt men geslacht tijdens het luisteren naar taal? En kunnen tweede taalleerders, die na hun puberteit Nederlands hebben geleerd, een dergelijk abstract systeem nog onder de knie krijgen? Hanneke Loerts deed er haar promotieonderzoek naar.

Uit de onderzoeken in Loerts' proefschrift blijkt dat het abstracte Nederlandse geslachtensysteem wel degelijk nut heeft tijdens taalverwerking: moedertaalsprekers gebruiken het lidwoord 'de' om te voorspellen wat het volgende woord zal zijn. Het lidwoord 'het' kan echter niet voorspellend gebruikt worden, waarschijnlijk omdat alle woorden voorafgegaan kunnen worden door 'het' wanneer zij als verkleinwoord worden gebruikt (zoals in 'het autootje'). Ondanks deze asymmetrie reageerden moedertaalsprekers wel even sterk op fouten van de- en het-woorden (zoals '*het tuin' en '*de huis'). De asymmetrie had echter wel weer gevolgen voor de reacties van late tweede taalleerders: na langdurige blootstelling aan het Nederlands konden zij fouten van de-woorden herkennen en repareren, maar fouten van het-woorden (zoals '*de brood') werden niet als fout herkend. Ook konden de late leerders geslachtsmarkering niet gebruiken om woorden te voorspellen. Het leren van een asymmetrisch en abstract systeem lijkt alleen mogelijk na jarenlange ervaring. En zelfs dan blijft het ongewone geslacht, de het-woorden, een immens struikelblok.

Hanneke Loerts (Leeuwarden, 1983) studeerde Applied Linguistics aan de Rijksuniversiteit

Groningen. Ze verrichtte haar onderzoek bij Toegepaste Taalwetenschappen aan de Faculteit der Letteren, het NeuroImaging Center en de School for Behavioral and Cognitive Neurosciences van de RUG. Zij promoveerde op 6 december 2012.

Autophagy, FOXO1 and proteostasis. Implications for human diseases

P R O M O V E N D U S

J. Yang

P R O E F S C H R I F T

Autophagy, FOXO1 and proteostasis. Implications for human diseases

P R O M O T O R E S

Prof.dr. H.H. Kampinga

Prof.dr. Wei-Guo Zhu

Rol van autofagie bij kanker en neurodegeneratie nader in kaart

Cellen maken niet alleen voortdurend nieuwe eiwitten en bouwen steeds nieuwe structuren, maar moeten ook steeds delen kunnen afbreken, recyclen en afvoeren. Autofagie is een mechanisme dat cellen in staat stelt om onbruikbare of beschadigde cellulaire componenten af te breken. Wanneer dit mechanisme ontregeld raakt, kan dit onder meer kanker, neurodegeneratie en veroudering veroorzaken. UMCG-promovenda Jing Yang bracht dit proces nader in kaart.

Uit het onderzoek blijkt dat FOXO1, een transcriptiefactor geassocieerd met cellulaire veroudering, autofagie kan stimuleren. Intrigerend was dat dit geheel onafhankelijk



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blijkt van de transcriptionele activiteit van FOXO1 en dat het de ontwikkeling van tumoren in een diermodel verminderde. Dit suggereert dat activering van autofagie mogelijk kan helpen kanker te bestrijden.

Ook ontdekte Yang dat FOXO1 ervoor kan zorgen dat verkeerd gevouwen eiwitten worden afgebroken, net voordat ze zich in de hersenen ophopen. Daarmee lijkt het bruikbaar in de strijd tegen neurodegeneratieve ziekten, zoals de ziekte van Parkinson, de ziekte van Huntington ziekten en ALS, die worden veroorzaakt door ophoping van verkeerd gevouwen eiwitten.

Tenslotte vonden we dat een verhoogde autofagie-activiteit werd geassocieerd met mutaties in een gen coderend voor het eiwit hepatocystin, hetgeen een zeldzame erfelijke vorm van leverziekte (PCLD) veroorzaakt. Anders gezegd, bij PCLD is remming van autofagie (in plaats van activering zoals bij kanker en neurodegeneratie) een optie als therapeutische behandeling.

Jing Yang (China, 1982) studeerde Geneeskunde te Peking. Ze verrichtte haar onderzoek aan de afdeling Celbiologie van het Universitair Medisch Centrum Groningen (UMCG), binnen onderzoeksschool BCN en aan de Universiteit van Peking. Yang werkt inmiddels als onderzoeker aan het Baylor college of Medicine in Houston (VS). Zij promoveerde op 12 december 2012.

Behavioural and physiological adaptations of precocial shorebird chicks to Arctic environments

P R O M O V E N D U S

K.L. Krijgsveld

P R O E F S C H R I F T

Behavioural and physiological adaptations of precocial shorebird chicks to Arctic environments

P R O M O T O R E S

Prof.dr. S. Verhulst

Prof.dr. R.E. Ricklefs

Steltloperkuikens warmen zich vaker onder een oudervleugel dan gedacht

Het onderzoek van Karen Krijgsveld gaat in op de vraag hoe de 'nestvliedende' kuikens van grotere en kleinere soorten steltlopers de balans vinden tussen groei aan de ene kant en functioneel vermogen (foerageren, warm blijven) aan de andere kant. Dit onderzocht zij aan de hand van het gedrag en de fysiologie van kuikens die opgroeien op de arctische toendra in het Canadese Churchill en zich daar aanpassen aan de vaak veeleisende weersomstandigheden.

Nestvliedende kuikens zoals die van steltlopers verlaten vanaf dag één het nest en scharrelen zelf hun voedsel bij elkaar. Omdat ze zichzelf in eerste instantie nog niet warm kunnen houden, keren ze regelmatig terug naar de oudervogel om onder diens veren op te warmen. Dit betekent dat deze kuikens bij uitstek gevoelig zijn voor weersomstandigheden en voedselaanbod.

Krijgsveld ontdekte dat kuikens van kleinere soorten steltlopers afhankelijker zijn van hun vermogen om energie en daarmee warmte te produceren; en dat grotere soorten, dankzij hun grotere volume, meer warmte vasthouden en daardoor toe kunnen met een lager functioneel vermogen. Tegelijkertijd groeien kleinere soorten ook sneller, waardoor ze steeds minder snel hun warmte verliezen. De snellere groei in combinatie met hogere functionele capaciteit bij kleinere soorten ten opzichte van grotere soorten, impliceert dat van een trade-off tussen groei en functionele capaciteit geen sprake is voor steltloperkuikens, zoals tot dan toe gedacht werd. In plaats daarvan lijkt de nodige ruimte te bestaan om de relatie tussen groeisnelheid en functionele capaciteit te veranderen. Daarbij lijken grotere en kleinere soorten verschillende strategieën te volgen.

Ook toonde Krijgsveld aan dat steltloperkuikens hun lichaamstemperatuur niet onder ca. 35°C laten zakken tijdens het foerageren. Hoewel ze zonder blijvende schade veel lagere lichaamstemperaturen kunnen overleven. Tot nu toe werd algemeen aangenomen dat nestvliedende kuikens hun lichaamstemperatuur tijdens het foerageren veel verder laten zakken, omdat dat mogelijk is. Maar door tijdig weer op te warmen onder de oudervleugel hoeven de kuikens relatief minder tijd te besteden aan opwarmen, waardoor ze in totaal meer tijd overhouden om te foerageren.

Karen Krijgsveld (Roden, 1969) studeerde biologie aan de RUG, waar zij haar promotieonderzoek uitvoerde bij de afdeling Gedragsbiologie, in geringe mate

Onderzoeksschool BCN. En bij de University of Missouri-St.Louis, VS. Haar werk valt onder het onderzoeksproject: Ecophysiological limits to northern breeding distributions of Arctic sandpipers (Scolopacidae). Het werd gefinancierd door RUG en National Science Foundation, VS. Sinds 2002 is zij werkzaam bij Bureau Waardenburg, als projectleider en onderzoeker Vogelecologie. Zij promoveerde op 14 december 2012.

Tinnitus. An MRI study on brain mechanisms

P R O M O V E N D U S

K. Boyen

P R O E F S C H R I F T

Tinnitus. An MRI study on brain mechanisms

P R O M O T O R

Prof.dr. P. van Dijk

MRI-onderzoek naar hersenmechanismen bij tinnitus

Mensen met tinnitus (oorsuizen) hebben last van een piep in de oren die andere mensen niet horen. Steeds meer jonge mensen hebben dit, vaak als gevolg van te luide muziek. UMCG-promovendus Kris Boyen heeft laten zien dat tinnitus is geworteld in een netwerk van hersengebieden en dat niet alleen het gebied dat geluid verwerkt (de auditieve hersenschors) erbij betrokken is.

Boyen voerde MRI-studies uit bij mensen met tinnitus. Zij onderzocht zowel de structuren in de hersenen, als de functies van hersengebieden. Zij stelt vast dat tinnituspatiënten meer grijze massa hebben in de auditieve hersenschors,

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maar ook in andere gebieden van het brein. De grijze massa is verantwoordelijk voor de verwerking van informatie.

Ook heeft Boyen een link gelegd tussen het hebben van tinnitus en het abnormaal functioneren van de thalamus. In een eerste studie vond zij een zwakkere functionele verbinding tussen de auditieve hersenschors en de hersenstam. In een vervolgstudie kon ze geen luidheidsafhankelijke activatie in de thalamus vinden, maar wel in de auditieve hersenschors en de hersenstam. Beide

resultaten kunnen geïnterpreteerd worden als het abnormaal functioneren van de thalamus bij tinnituspatiënten. Boyen stelt dat de resultaten van haar onderzoek ons een stap dichterbij begrip van het ontstaan van tinnitus brengen.

Kris Boyen (België, 1986) studeerde Logopedische en Audiologische wetenschappen aan de Katholieke Universiteit Leuven in België. Haar onderzoek maakt deel uit van het onderzoeksprogramma 'Healthy Ageing and Communication' bij de afdeling KNO van het UMCG en werd uitgevoerd in het kader

van onderzoeksinstituut BCN. Het onderzoek werd gefinancierd door The American Tinnitus Association, de Heinsius Houbolt Foundation en NWO. Boyen werkt als onderzoeker bij de afdeling KNO van het UMCG en is als docent verbonden aan de Hanzehogeschool in Groningen. Zij promoveerde op 9 januari 2013.

■ PHOTO: SANDER MARTENS

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



> AGENDA BCN ACTIVITIES

March 14 and 15, 2013

BCN Retreat

June 19, 20 and 26, 27, 2013

BCN Statistics Course

Check the website for detailed information.

■ DIANA KOOPMANS
(D.H.KOOPMANS@UMCG.NL)

> FOREIGN ADVENTURES

New York City

One of the things I paid attention to while selecting my Master's programme was the possibility to go abroad. Luckily the BCN-ReMa did exactly that by offering students the chance of doing their major projects in a foreign place. I gladly took that opportunity by looking for interesting projects all over the world. Thanks to an interesting paper on epigenetics I read during the first year course 'Individuality of Behavior', I decided to mail the author, Prof. Curley. He responded very positively, and after some mailing back and forth I finally decided to go! Unfortunately his lab was far, far away, so I had to fly all the way to New York City, where Columbia University resides.

I arrived in NYC almost two weeks ago, and have been living in the International House which is in the Upper Upper West Side (walking distance from Columbia). I-House houses 700 students, visiting scholars, interns and trainees from all over the globe. It is a great community that will add to my experience abroad, where I have met many people and already feel very much at home. Talking to interesting scholars from other disciplines is opening my eyes to all the variety that the world has to offer, and I love it! The first few days here have been amazing, and already packed with experiences. The campus is great, although a little empty due to the students still having holidays. My supervisor just arrived in NYC, and we will meet today to talk the whole project over. My project will consist

of manipulating the early life environment of young mice by changing the consistency of the conspecifics around them, and studying the long-term effects of these experiences on social behaviour. Next to this behavioural aspect, we will study the potential accompanying brain changes and how epigenetics might have played a role in this process. I am excited to begin!

So far I have done the unavoidable touristic stuff, like climbing the Empire State Building, taking a ferry to Staten Island, walking the Brooklyn Bridge, visiting a comedy club, the Natural History Museum, seeing a fashion show and taking a ride in a limousine. The interesting thing here in NYC is the incredible energy and liveliness that the city oozes. It feels like anything is possible, and I feel like the world is at my feet. I will fully enjoy the coming 7 months that I will be here, and perhaps even longer. Due to my fortunate position of having dual citizenship (thanks parents), I have the opportunity to stay as long as I want. I will keep my eyes open for interesting PhD positions either here or back in Europe, and who knows where I will end up...

Hope all is well back in Groningen,

Best wishes from New York,

■ NEAL BOUWMAN

■ PHOTO: NEAL BOUWMAN



> *It feels like anything is possible*

> ONE CAN ALSO LEARN FROM “STELLINGEN”

The trouble with the world is that the stupid are confident and the intelligent are full of doubt. – Bertrand Russell

> **Veerle Baaijen**

Promoveren is als een theaterstuk, rijkelijk gevuld met humor, drama en romantiek.

> **Kris Boyen**

The saddest thing that I've ever seen, are smokers outside the hospital doors. – Tom Smith, Editors.

> **Wouter Frencken**

If I have the gift of prophecy, and know all mysteries and all knowledge; and if I have all faith, so as to remove mountains, but don't have love, I am nothing. – 1 Corinthians 13:2

> **Elise Verhagen**

In contrast with folkwisdom, goldfish's memory can retain information for a considerable longer time than 3 seconds. – dedicated to my late goldfish Heikki

> **Jacolien van Rij**

> COLOPHON

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