

Sonnets on science



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 groningen

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Time flies: an interview with Andrea Soto Padilla



Short time perception is one of those strange abilities we are not really aware of. When you want to cross the street, you need time perception to make an estimation about how fast a car is approaching and then decide if you are going to cross the street or not. While most research about time perception is done in the fields of psychology and computational neuroscience, Andrea Soto Padilla was also intrigued by the topic and is currently investigating time perception in fruit flies. Although this animal model seems a strange choice, she explains how we can take advantage of *Drosophila melanogaster* to understand how time perception works in the brain.

How did this idea to study time perception in fruit flies arise?

It all started with my two co-supervisors: Hedderik van Rijn from the Department of Psychology and Jean-Christophe Billeter from GELIFES. They started talking to each other about their research and suddenly realized there was no model in fruit flies for time perception in the interval timing range, which is seconds to minutes. So they had an amazing opportunity to do something new and started planning the creation of a suitable method. At that time, I came to Hedderik as a master student and said that I really wanted to study this type of time perception. So he introduced me to the project and I thought it was really fascinating. I really

liked the chance of doing something new. Ody Sibon from the medical faculty got involved soon after and luckily we got the funding to continue the research through a PhD.

Can you tell us a little bit more about the experiment?

Basically we use a box that has three copper tiles on which the temperature can be controlled. Flies are very sensitive to temperature changes, so when it gets a little bit too hot for them they will walk away. We put the flies into the box and play a sound that is either long or short and we are trying to condition the flies to go to the left on the long sound and to go to the right on the short sound. The conditioning comes from pairing these sounds with the temperature changes. We try to prove that flies can use temporal information by understanding that one tone is short and the other long and using this to decide which direction to move to. Our pilot study had really promising results. Now we are trying to replicate the results, improve it and make the method a little bit cleaner.

> Non-scientists think it is awesome because they are fascinated by the fact that flies have a brain and that flies can be used for something. <

>> CONTINUATION OF TIME FLIES: AN INTERVIEW WITH ANDREA SOTO PADILLA

> Flies have answered some questions that vertebrates could not because flies allow genetic and molecular techniques that do not exist in vertebrates yet, and permit us to do really specific manipulations to understand how genes and behaviour relate. <



What is the general reaction you get when you talk to people about your research?

Well, it depends on which group of people I am talking to. Non-scientists think it is awesome because they are fascinated by the fact that flies have a brain and that flies can be used for something. I think that is kind of funny, because fly research has existed for over a hundred years. When I talk to students or professors that are doing something non-related to my project, the general reaction is 'wow, you're doing something new, that's awesome!' When I talk to people that are related to the project in the psychology department, they often immediately classify me as a 'fly person'. The general reaction that I get is that they think it is kind of weird, but that it is really cool if it works. When I talk to fly experts, they assume that flies can do it, so they are not surprised that we are trying to research this in flies. But at the same time, they wonder how we are going to demonstrate that they can perceive time. In the fly community there is a really broad debate on techniques, and your methods have to be extremely clean for your research to be acceptable.

You probably get in contact with a lot of different departments.

Yes, I realized that people from different departments communicate differently. They have the same idea but use different words. So you become bicultural. But that is a really good thing for the future, because at the end you have to deal with people with different backgrounds. So having some expectation about how they prefer things done helps to be more efficient.

When I read your project description on the website of the RUG, I had to laugh, because you describe the *Drosophila melanogaster* as the 'infamous fruit fly'. Do you think the fruit fly gets enough credit?

Well, not as much as it should (laughing). Seriously, a great part of the non-scientific audience does not realize that research requires animal models and that animal models go beyond the classic mice or rats. We can use a lot of species for different questions. Flies have answered some questions that vertebrates could not because flies allow genetic and molecular techniques that do not exist in vertebrates yet, and permit us to do really specific manipulations to understand how genes and behaviour relate. When it comes to the scientific

community, I think the fly research is generally seen as very basic by some and hence they demand a lot of details from each experiment; but most realize that flies are important and appreciate the research done with them. Within the fly world, nobody is saying that the fly is the only answer, just that it is an amazing and interesting blue print of our own species. Results in flies can guide research in areas such as behaviour, neurodegeneration, aging, and even psychiatric disorders by providing a relatively simple animal that is easy to manipulate. Others will use the results for their own models.

What would be the next step after you show that flies have time perception in seconds to minutes range?

The next step would be to do some tests with different mutants, to come up with an idea of what mechanism and pathways the flies are using. Once we have mapped out where the possible areas are that are related to time perception, we can use different genetic and molecular techniques to explore these areas further and try to narrow it down to the basic neuronal structures. Then we could use other techniques to explore individual cells, particular neurotransmitters or specific genes. Hopefully at the end we will know how flies manage to perceive time in the seconds to minutes range.

■ BY MANON VAN ASSELT

Afterthoughts: PhD Double Interview with Jorien van der Velde and Kees Mulder

It is a sunny afternoon when Jorien van der Velde and Kees Mulder meet each other in the city centre of Groningen to enjoy a cold beer and talk about the past couple of years. Although the topics of Jorien (the neural basis of emotion regulation) and Kees (time-place learning in mice) are very different, they find a lot of similarities on how they experienced setbacks and agree that no matter what happens, it should not hold you back from your promotion.

Jorien

Alright, so let's start with you. What was your project about?

Kees

I investigated episodic memory in mice, which is the type of memory that encodes 'what-where-when' information and is most susceptible to aging and neurodegenerative diseases. I used a task called 'time-place learning'. The mice had to learn that the food location depended on the time of the day. To perform well they needed to use their biological clock. This circadian system is also very sensitive to aging and neurodegenerative diseases, but we know very little about how the circadian system is related to memory.

Jorien

Interesting. What was your conclusion?

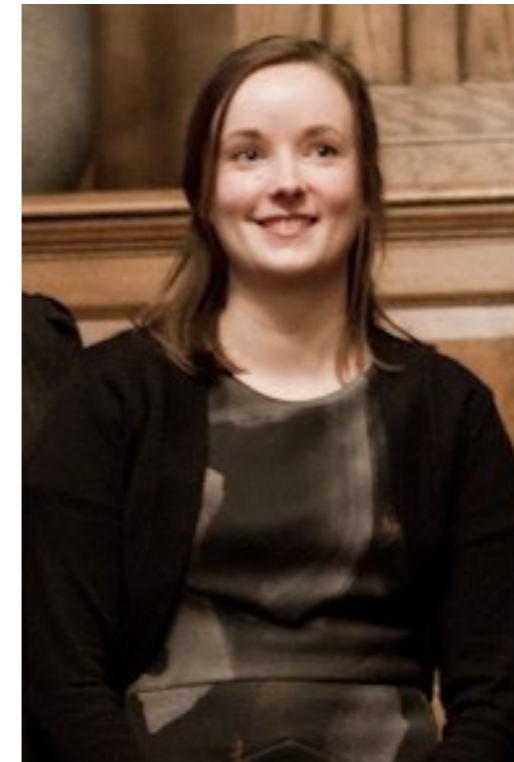
Kees

Circadian rhythms are generated in the SCN in the brain, but also by organs like the adrenal glands. However, mice without the SCN and adrenal glands still performed well on the time-place learning task.

So apparently the memory system has another source that provides information about time. Additionally, I showed that the ability to learn the task is lost with aging at a relatively young age. Interestingly, when mice were trained from young age, they did not lose the ability to adapt their memory until old age. What was your project about?

Jorien

I investigated the neural basis of emotion regulation in a group of subjects that was at high risk for developing psychoses. We did this by asking subjects to regulate their emotions in the fMRI scanner and analysed their brain activity. We scanned three risk groups: a group of subjects with ultra-high risk to develop psychosis, a group consisting of siblings of schizophrenia patients, and a third group of subjects that score high on alexithymia. People with alexithymia have more trouble expressing and identifying their own feelings, which we know correlates with the development of psychosis. What we saw was that subjects with a high score on alexithymia and siblings of schizophrenia patients do not differ from controls in brain activations during emotion regulation. However, subjects with an ultra-high risk for developing psychosis clearly showed



less activation in the prefrontal cortex which possibly points towards emotion regulation problems.

Kees

And when was your promotion?

Jorien

In January. That feels like a very long time ago! I can't really remember all the things I said during my defence, it went so fast.

> Make sure that at the moment you can do nice things, you really do enjoy them. <

>> CONTINUATION OF THE DOUBLE INTERVIEW WITH JORIEN VAN DER VELDE AND KEES MULDER

> *Don't be a slave of your supervisors and take matters into your own hands. There has to be space for your own ideas and independence.* <

Kees

Yes, I had the same feeling. My promotion was in April and it was almost like someone else was sitting there instead of me. I was very surprised when the pedel entered and ended the session with a loud 'Hora Finita!'.

Jorien

So what do you do now?

Kees

I am a postdoc at ERIBA. We investigate a gene that is involved in protein aggregation, which is the cause of neurodegenerative diseases such as Alzheimer's Disease. This has been shown in vitro, in the C. Elegans and in human cell models, and now we are developing a mouse model.

Jorien

Do you want to continue with a scientific career?

Kees

Well, I always enjoy analysing new data, learning new things and exploring the boundaries of science, but you also have to pay a price. It also causes frustrations, stress, and you have little time for family and friends. It is 'publish or perish' and many people fighting for the same source of money. But, science is above all lots of fun, exciting and inspiring. So, I keep an open mind and see what opportunities come to my path. And what are you doing?

Jorien

I'm currently working as a teacher of Applied Psychology at the Hanze University and also work one day per week at Lentis Research as a senior investigator. I like teaching, and the combination with research makes it even better.

Kees

Sounds fun indeed! But back to your PhD, did you have any low points during your promotion trajectory?

Jorien

Yes, I remember very clearly. I accidentally switched two template files. I discovered this while my manuscript was already at the journal Cortex! We had to withdraw it. I felt so bad! But we did the analyses again and it still got published in Cortex. Did you experience any low points?

Kees

Well, me and my colleagues suffered from the migration of the Biological Center in Haren to the Center of Lifesciences at Zernike. But I had other start-up problems as well. My first publication got delayed for more than a year because of one slow reviewer and my second manuscript got rejected at the first two journals. The results were also not ideal in the beginning, but they all came together in the end. Then everything went very fast and eventually I got to publish all my findings. Maybe that gives hope to PhD students that are still in the slow beginning phase.

Jorien

Yes, that slow start is also very familiar to me! But luckily a PhD has also a lot of good sides. What was your favourite thing?

Kees

The money has been arranged, so you can go on a free exploration. You can develop yourself, follow courses, go to international conferences and make friends all over the world. I was in India for a month for a summer school. That was really awesome. And I really liked the fact that you can determine your own working hours, even though you usually exceed a typical workweek.

Jorien

Yes, that is a big advantage. In the beginning, my PhD felt a lot like an extension of my college period. I had very nice colleagues and I also was lucky to go to a lot of conferences abroad.

Kees

I agree totally. Do you have some tips for beginning PhD students?

Jorien

Enjoy your PhD, despite the fact that it can be extremely busy, especially at the end. Make sure that at the moment you can do nice things, you really do enjoy them. I think dealing with stress differs a lot between people. My advice is to just go on, because after the promotion the reward is big. Do you have any tips?

Kees

I would add to that that you have to realize you are trained to be an independent researcher as a PhD student. So don't be a slave to your supervisors and take matters into your own hands. There has to be space for your own ideas and independence. By the way, it is getting late. I think we should round up.

Jorien

Yes, nice talking to you. Always fun to talk to another ex-PhD student.

■ BY MANON VAN ASSELT

■ PHOTO JORIEN BY HARMEN PIEKEMA

■ PHOTO KEES BY ANNIK VISSE

In Memoriam Laurie Stowe

On August 6, just after her 60th birthday, my dear colleague and friend Laurie Stowe passed away after a brief illness.



Laurie had been a neurolinguist at the University of Groningen since 1991 and was an active member of BCN practically from the start of BCN. Her first – temporary – position in Groningen was in fact made possible by a grant from the University of Groningen to BCN. In collaboration with linguists Frans Zwarts and Jan Koster, psychologist Bert Mulder, and radiochemist and co-founder of the PET center Wim Vaalburg, Laurie explored the possibilities of using PET to study language processing in the brain, which was still in its infancy back then. I got to know Laurie during this period, when I was a PhD student at the Faculty of Arts attempting to cross the boundaries between faculties through my involvement in the interfaculty educational programme Cognitive Science and Engineering (now Artificial Intelligence). When I wanted to show off the latest and coolest findings about language and the brain to new students and their parents, Laurie was always happy to lend me her slides with color images of PET scans. And for advice about setting up a linguistic experiment or the latest insights in sentence processing, I could always turn to Laurie.

In addition to being a very warm and generous person, Laurie was also an internationally recognized expert in the field of neurolinguistics. Her research focused on sentence comprehension, including second language processing, using techniques such as PET, fMRI and ERP. In 1995, she was awarded a prestigious PIONIER grant from NWO for the project “The Neurological Basis of Language” and got a permanent position as an Associate Professor at

the Faculty of Arts. During her years in Groningen, she was very active in BCN. She was a member of the Education and Curriculum Committee of BCN, was involved in the organization of many BCN events and served on the BCN Think Tank. She also hosted numerous potluck parties and barbecues at her home. As both her work and her culinary activities were an important part of Laurie’s life, she liked to combine the two and frequently invited students and colleagues over for dinner. Many of us have very fond memories of these dinners at Laurie’s place.

During the past five years, Laurie was involved as a senior researcher in Monika Schmid’s NWO Vici project on second language acquisition and first language attrition. She greatly enjoyed advising and mentoring the PhD students, discussing the outcomes of the experiments with them and being part of this internationally oriented team of researchers. Besides her participation in the Vici project, Laurie collaborated with many other researchers on various topics in sentence processing, such as the processing of prosody, time reference, polarity, pronouns and idioms, and was highly interested in the effects of ageing on sentence processing. She also worked on her own research topic, one that made her eyes twinkle each time she talked about it: a literature review on the so-called ‘sentence wrap-up effect’, which Laurie argued did not exist. Work on this topic progressed slowly because of Laurie’s limited eyesight. A few months ago, while she was already at home because of her illness, she confided to me that the paper on this topic was at the top of her bucket list. Although a draft

version had been circulating among colleagues in the spring, unfortunately she did not manage to get the paper ready for submission.

By the end of 2014, Laurie began to feel tired and not much later everybody could see that she had lost a lot of weight. At first, Laurie thought of anemia, but in March of this year it became clear that she had cancer and would not recover from this illness. Students, former students and colleagues continued to visit her at her home, which Laurie enjoyed immensely. In July, Laurie regained enough energy as a result of a change in medication to be able to make a final trip to the United States to spend some time with her family and friends while celebrating her 60th birthday. After her return to Groningen, however, her condition quickly deteriorated. Two weeks later, she passed away at home, surrounded by her friends. She will be missed dearly by everybody who knew her.

While finalizing this piece of text the week after Laurie died, in my mailbox in the Harmonie building I found a brown cardboard envelope addressed to Laurie, containing the book that she wrote with Monika and the other members of Monika’s Vici project. It was the author’s copy sent to Laurie by the publisher. The book was prepared by the Vici team as a collaborative effort and Laurie had very much enjoyed working on it. It is very sad that she did not see this final result. Laurie would have been so proud of it.

■ BY PETRA HENDRIKS
■ PHOTO BY BABS VAN LEEUWEN,
TAKEN ON JULY 6, 2015

Sonnets on science: Interview with Marije van Beilen

Neuroscience is popular! It all started a few years ago with the book *We Are Our Brains: A Neurobiography of the Brain, from the Womb to Alzheimer's* by Dick Swaab. Recently, a Dutch television show broadcasted a three-part lecture sequence featuring Prof. Erik Scherder on the brain. Neuroscience is a hot topic!

*Marije, you wrote a popular book on the brain (entitled: *Brein & Zijn*), what motivated you to write about a complex topic as neuroscience in a –so to say– simple way?*

In research you depend on grants, therefore I was looking for an assured way to stay engaged in science. When working as a scientific journalist, you are working in science, but you do not depend on grants. Another great

advantage of working as a scientific journalist is that you can delve into a lot of different topics and areas, whereas a researcher focuses on mainly one topic at a time.

How did your book come about?

Reinier van den Berg, an artist and member of De Ploeg, made twelve so-called sawmills of the brain (<http://www.reiniervandenberg.nl/art-gehirn-leer.html>).

Because of a previous collaboration he asked a friend and writer, Hans Broekhuis, to write a dozen sonnets about existential questions and absurdities of the human brain based on these twelve sawmills. Eventually, they saw an article about my research in a newspaper and invited me to the project. They asked me to write twelve essays about neuroscience in everyday life.

> *Being a scientist is a way of life.* <



>> CONTINUATION OF SONNETS ON SCIENCE: INTERVIEW WITH MARIJE VAN BEILEN



Who do you want to reach with your book?

Mainly the people that raise our children. One can make a difference by educating people. I tried to write in the style of women's magazines; it was supposed to be fun to read, but also provide readers with thorough scientific knowledge. Furthermore, I aimed to show them that as a scientist, you are also only human after all.

What is your favorite essay?

My personal favorite is the one about 'taste'. I did research with Frans Cornelissen, and this really changed my view on food. I try to teach my children to say: "this is a difficult taste, you still need to learn this one" instead of "you find this unappetizing".

Your essays are more than once very personal, about your children for example, why is this?

That was a conscious choice, I am aware that my book is personal. The intent I made it this personal is twofold, first I want to illustrate that being a scientist is a way of life. If you are at home in the evening, you are still a scientist and you view the world around you through the glasses of a scientist. Second, I want people to get over the idea that a scientist is a superhuman, I want people to recognize that scientists are normal humans too.

This Newsletter also has a lot of non-Dutch readers, will your book be translated?

(laughs) No.

So, what is the main message of your book?

Your brain is continuously in contact with the outside world through the environment and behaviour of yourself and others. People can learn from neuroscience that they have an influence on the development of their brain through the choices they make in everyday life. The general opinion is still that body and mind are two separate things, but us neuroscientists know that this is not true. Hopefully, my book will contribute to a better understanding of the close relationship between body and mind.

Are there other ways in which scientific journalism is communicated to a larger public?

Yes, on social media. In the UMCG it is policy that employees are allowed to communicate about their work and personal life through social media. The internal communication office gives guidance which emphasizes using your common sense in what you share or not, and the balance is maintained between professional and personal. They say: what you don't share at work standing by the coffee machine, you should not share on twitter. But a mixture of personal and professional messages on your twitter or facebook account is perfectly all right, as UMCG clinicians are normal humans too. To my viewpoint this is a nice innovation. Furthermore, I work as a scientific journalist for Kennis in Zicht (<http://www.umcg.nl/NL/UMCG/kennisinzicht/Paginas/default.aspx>). This is an e-magazine that appears online on a monthly basis. The nicest thing about participating in this, is that you can interview scientists from other research fields.

Last but not least, do you as a scientific journalist have any tips for the BCN journalists?

As a tip, I would like to advice BCN journalists to stand next to the researcher you are interviewing. Always seek cooperation. If researchers feel you are on 'their side', they will not only share their scientific findings and knowledge, but also their questions and doubts with you, which can be valuable.

■ BY STÉPHANIE KLEIN TUENTE
 ■ PHOTOS BY SANDER MARTENS

> A COLUMN ABOUT LIFE AS A POSTDOC

The Wandering Mind

I remember that when I was a young high school student, while cycling back from school, my mind might wander off when I wasn't distracted by fellow students' down-to-earth conversation topics. One idea that I was interested in early on was the classification of sciences. To me, some sciences appeared more "fundamental" than others. For example, it was clear to me that chemistry essentially is a peculiar branch of physics, i.e. the physics of complex arrangements of elementary particles into what we tend to call molecules. That doesn't mean that chemistry is less interesting than physics, but at least one could be reduced to the other if knowledge were sufficiently detailed. Similarly, biology isn't much more than the chemistry of really complex assemblies of particular kinds of molecules, and medicine seems to be a rather refined bit of biology. Extending this line of reasoning further, one could with a little fantasy imagine nesting neuroscience within medicine, psychology in neuroscience, and continuing with sociology, anthropology, and other social sciences from there on. The tree would have parallel branches, like linguistics as well as economics sprouting from sociology perhaps, and there may be subdomains in between that I have here skipped, but I could see everything I knew fit in. Almost.

Of course this immediately raised the question whether there was anything more fundamental than physics; that is, is physics the root of the

tree, or is there anything that physics can be derived from at least in principle. And, on the opposite end of the spectrum, is there any science that adds some quintessentially un-physical ingredient? Despite being a physicist myself, I answered both of those questions affirmatively.

Physics relies on mathematics, since the most fundamental foundations of physics essentially consist of an immensely elegant mathematical framework. At the same time, mathematics doesn't seem to rely on anything tangible. I guess one could state that math studies anything that displays structure, irrespective of its (physical) incarnation. Many structures might not underlie reality, but some do, and those constitute physics. I don't think there can be anything beneath mathematics, because it would have to lack any kind of structure, and – frankly – I cannot imagine anything structureless. Even chaos theory is filled to the brim with beautiful bits of structure.

Conversely, there are things that I cannot see being reduced to physical sciences, not even in principle. Leaving aside religion, the most notable example is consciousness, or perhaps I better call it self-awareness, for lack of a better word. By that I mean my subjective experience that there is some kind of sentience in my head; call it a homunculus, a mind, or even a soul if you are so inclined. This leaves me with

a strange puzzle. Is there some rare fundamental particle that is sentiently charged? I guess not. Either awareness is an emergent property of any sufficiently complex system, in which case there must be numerous systems that are aware, from intelligent lifeforms

to the internet to the universe as a whole. Or, one could take the view that awareness is a particularly clever illusion. I do not have much trouble accepting that free will is an illusion: it seems unavoidable based on both physics and neuroscience. And without free will, awareness loses a lot of its appeal; it would be passively undergoing the laws of nature, playing out reality like a record player plays a record. But nevertheless, I internally feel aware of something that exceeds the neuroscience, biology, chemistry, physics, and math of my brain. I am not just playing out reality, or am I?

With that, we arrive on treacherous territory. The kind of self-awareness that I experience in my head is impossible to objectify. Any of my behaviour could in principle be displayed by a sufficiently well-programmed inanimate robot. In fact, apart from being carbon-based wetware

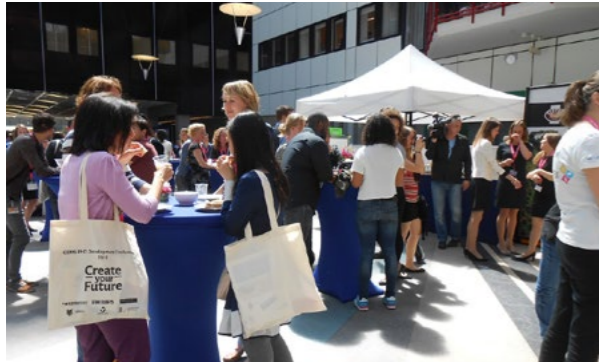


instead of silicon-based hardware, I consider myself such a robot. If sentience cannot be made objective, it cannot be tested by an external experimenter, and it ceases to be conventionally called science. But then I realise that there is no such thing as an external experimenter anyway, because any experimenter must interact with the system under observation. So here I find myself, experiencing myself being sentient, the observation equalling the object of the observation.

The problem remains unsolved. I am no philosopher, but perhaps the safest thing to do is apply Occam's razor: I cannot experience any sentience except my own, therefore mine is the only one that exists? Ergo, if there is a God, I am Him! Please call a doctor now...

■ BY DAVE LANGERS





PhD students discover their talent - GSMS PhD Conference 2015

It has been a great honor and learning experience to organize the GSMS PhD Conference, and create the opportunity for PhD students to leverage the greatest advantage for their future careers. The key message of the PhD Conference 'Create your Future, Discover Talent', held on June 11th and 12th at the University Medical Center Groningen, was to excite and mobilize PhDs to use their PhD as a tool for their future...now! The conference was targeted at all 1200 PhD students of the Graduate School of Medical Sciences (GSMS), of which approximately 19% belong to the BCN research institute.

A recent publication from the Rathenau Institute on the talent selection process in research funding and careers highlighted the fact that a growing number of PhD students and post-doctoral researchers are being trained ... and seeking employment which leverages their training (van Arensbergen, 2014). These PhDs do significant work without much prospect for an academic career (Halffman and Radder, 2013). Because of a growing awareness of the importance of human capital, more and more attention is being paid to talent selection and talent management – in part to prevent excellent scholars from leaving academia.

The University of Groningen provides support for academics at all stages of their academic

careers via the Talent Development Programme, which is led by two of the GSMS conference speakers: Prof. Ritsert Jansen and Prof. Ingrid Molema. Until recently this service was mainly focused on students and senior researchers, leaving a gap for the guidance of PhD students. During their projects, PhDs are involved in many forms of scientific research, education, and personal development. However, as the Talent Development Programme says, 'good academic talent is more than a person who knows a lot about their subject'.

In order to further assist PhDs in their journey to the desired job and, more generally, an enjoyable life, we felt there was an insuperable need for discovering PhD talent by means of

self-reflection. We were inspired by the 'Golden Circle' concept by the famous writer Simon Sinek, which says that 'the purpose, cause, or belief that inspires us to do what we do' is central to human motivation and success. Some PhDs might have settled into a project that is not fulfilling their professional aspirations (enough). As we learned from one of our keynote speakers, Lidewij van der Sluis (Prof. of Strategic Talent Management at Nijenrode Business University), 'those PhDs haven't ignited their inner fire'. This inspired us to design a two-day conference, wherein the first day would focus on discovering talent and the second day would focus on assisting in translating talent and creating a future pathway out of it.

The first day of the conference started with an inspiring talk by the well-known Dutch philosopher Bas Haring. He walked us through several life stories of talented people, which raised awareness on the visibility of talent. How do you know what makes you tick? How does the environment exhibit or hide individual potential? Following this, a lively and insightful

discussion panel wholeheartedly shared their own experiences, giving valuable insight into the gift of talent and what opportunities or even responsibilities comes with that in our work environments. After these informative session, it was time to actually mobilize the PhDs. It was a great surprise when the swinging sounds of salsa music filled the Fontein Patio and the dancers from Juan Carlos salsa school started a flashmob. Capturing the attention of PhDs as well as hospital visitors, patients, and medical staff, we felt this was a successful warm up for the workshops in the afternoon which focused on self-awareness, critical thinking, personal effectiveness, assertiveness, and out-of-the-box communication tools. Alongside these interactive small group sessions, PhDs had the opportunity for an individual talk with one of three professional PhD coaches. Furthermore, students could attend lectures on intellectual autonomy, healthy ageing, and time management. Following a concrete evaluation, the organizing committee was able to conclude that the attendees especially liked these interactive conference elements, which

>> CONTINUATION OF PHD STUDENTS DISCOVER THEIR TALENT - GSMS PHD CONFERENCE 2015



> *Good academic talent is more than a person who knows a lot about their subject.* <

provided them with tools and insights on their strengths and weaknesses as job candidates. In the evening it was time for a delicious meal and live music at El Txoko restaurant. We went home fulfilled with good vibes of the lively interactions among attendees.

The second day of the conference was designed in terms of valorization, in part because of the aphorism 'talent is in the eye of the beholder'. Together with professionals from academia, government, and business – who shared their personal career experiences – we discussed the additional value of a PhD degree. Based on the responses from the audience, we had the impression that it is still new or even uncomfortable for PhDs to design their own career pathway as opposed to following the opportunities that appear in their working environment. During lunch, attendees had the opportunity to meet with a variety of companies, the representatives of which we had specifically invited because they had themselves finished a PhD. Subsequently, workshops on (job-)profiling, networking, personal branding, entrepreneurship, and dealing with stress ran in parallel with lectures on decision making, quantified self, and teamwork. We closed the

conference with a networking drink in the Fontein Patio.

We would like to sincerely thank everyone who made this conference possible: first and foremost, the 250 PhD students who attended the conference. We are very grateful for the time, enthusiasm, and endorsement they provided for this event. The next thank you goes to the Management Team of the GSMS for making this whole conference possible and for supporting the vision of education and development of their students. Furthermore, a big thank you to our main sponsors Philips, Netzodruk, Sanofi, and Baseclear. We also had great volunteers, who assisted us in a smooth conference. Finally thanks to all support personnel and other people who were involved.

Based on the overall feedback we received from PhD attendees, speakers, company representatives, and others who were involved, we feel that the conference succeeded to inform, inspire, and mobilize PhD student to explore and follow their talent.

■ **BY HELEEN HOOGVEEN**
CHAIR GSMS PHD CONFERENCE

Introducing a new staff writer

> **HELEEN HOOGVEEN**



Following an intrinsic curiosity in understanding the normal and pathological relationship between brain function and behaviour, I started my PhD at the Neuroimaging Center of the University Medical Center Groningen (UMCG) in 2012. My research focuses on the neural substrates that underlie age-related changes in eating behaviour, and uses different methods like EEG and fMRI. With rising rates of disorders related to eating behaviour, I feel honoured to contribute to the pioneering work on the neuroscience behind adequate food intake in the TI Food and Nutrition private and public partnership.

The interdisciplinary nature of BCN is of great value to me, as it provides the opportunity to exchange expertise and passion with other neuroscientists. In order to enhance communication within BCN, I was previously involved in the PhD Council and UMCG PhD conference, both of which let me contribute to the personal development of PhD students. Being a member of the BCN Newsletter team is a great new opportunity for me to further discover the people behind our research institute. I'm looking forward to being involved and providing you with some interesting articles.

BCN Symposium – Using BIG Data



On May 29 the BCN Symposium *Using Big Data – Approaching complexity in neuroscience* was held in the beautiful location: *Van Swinderen Huys*. The day started with a lecture by Bregje Wertheim, from the Groningen Institute for Evolutionary Life Sciences, who told us very enthusiastically about her research on the complex genetic architecture of traits and processes in the *Drosophila*. She set the standard of big data high by showing lots and lots of tables containing many data. The attentive viewers may have noticed that on the bottom of her slides was a note that the table consisted of thousands and thousands more data rows (BIG DATA).

After the first coffee break the symposium continued with a lecture by Lude Franke, Genetics (UMCG). An interactive graph on the first slide of his presentation showed an exponential increase of genetic risk factors that have been found for many different diseases over the last few years. Nevertheless, he highlighted the problem that traditional prospective follow-up studies take dozens of years and are very costly. However, he outlined a novel strategy using large amounts of publicly available human RNA-seq data (BIG DATA) to overcome these problems and identify environmental risk factors and gene x environment interactions. Although some of the attendees were worried about privacy issues associated with using these RNA-seq data, Lude's strategy sounded promising and both time and cost saving.

The morning continued with a presentation by Elske Bos, Department of Psychiatry (UMCG). She provided the audience with an informative talk on the study of large scale samples from the population, which is a dominant research approach in the field of the psychiatric research. The study is called "How nuts are the Dutch?" (Hoe gek is NL?) and uses a new approach that is more suitable for the study of processes

that take place at the individual level. In short, this 'idiographic' approach power is derived from the multitude of repeated measurements instead of the multitude of subjects. This makes it possible to unravel cause-effect relationships, mechanisms of change and may also be of direct clinical relevance. She concluded by saying that combining data in a 3D-dataset with many subjects as well as many repeated measurements (BIG DATA) may be the ultimate way to reveal prototypes of patients who share certain dynamic patterns and etiologies.

After a good lunch the floor was passed to Johan Bos, from Computational Linguistics, who gave the audience a very entertaining presentation about getting "Lost in Translation". It was surprising to see how a quite short and simple text of Roald Dahl's *Big Friendly Giant* was so hard to be translated into computational semantics. There are so many possible options (BIG DATA) that it is hard for a computer to detect the exact meaning of the words. With some nice illustrations, e.g. "advanced warning" (warnings are always in advance), a paper stating "Diana was alive hours before she died" and his personal favorite "nothing sucks like Electrolux", Johan showed that many mistakes can be made in translation.

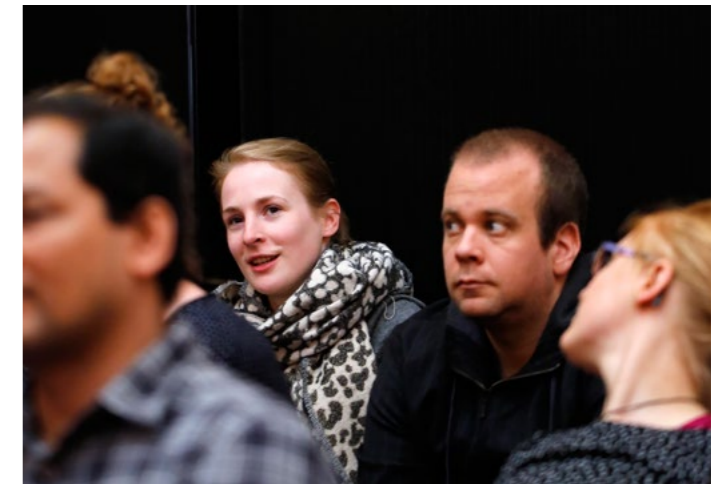


>> CONTINUATION OF BCN SYMPOSIUM – USING BIG DATA

He also had a tip for a lonely evening without funny television shows: visit Google Translate and type in different sentences. You will definitely laugh your ass off.

The symposium started with flying animals (i.e. Drosophila) and closed with the flying birds of Camilla Hinde, Behavioural Ecology, University of Wageningen. She presented a subsection of the work from the Oxford Social Network Group. In this project they used Passive Integrated Transponders (PIT tags) attached to a large population of free living great tits (>800 per year = BIG DATA) in Wytham Woods, Oxford. This allows research to track the movements in time and space of individual birds. Moreover, she explained the complexities of working with such data, as well as how associations between individuals can be inferred. After all these inspiring and by times complex talks about BIG DATA, everyone was pretty happy with the BIG DRINKS afterwards.

■ BY STÉPHANIE KLEIN TUENTE
■ PHOTOS BY SANDER MARTENS



> ALUMNUS COLUMN

On highly-educated hippies

I am sitting at the gate on Detroit Metropolitan Airport, waiting to board a plane back to the Netherlands. I was about to say, back home, but this place has become my home too. In the last four and a half months that I have been living in Ann Arbor, it has grown on me. Ann Arbor is a small town in Michigan, about an hour from Detroit. It is a university town, where most of the people are either working or studying at the University. This creates a really interesting vibe, similar to the vibe in Groningen. Next to that, Ann Arbor is also a true hippy town. There is even a hash bash, which is a day in April when everybody gets stoned. Word on the street was that Snoop Dog visited Ann Arbor that day.

This combination of high education and hippy mentality creates a very interesting group of Michiganders. People here are passionate, about life, about their work, about the world, and how we can make a positive change. I've met an American who is a Palestinian activist, who was refused at the Israelian border but still tries to get in to support her Palestinian friends. One of my American friends is a choreographer, who made an amazing dance piece about South-Africa and the apartheid war. I've met a whole group of Math postdocs, who, by the way, have the greatest job in the world as they are employed by the University of Michigan and at the same time travel around the world. After all, the only thing

they need to do math is a piece of paper and a pencil. And even though the academic environment is quite tough and competitive, I have met many fellow postdoc colleagues that are seriously planning to be professors and do research for the rest of their life. For me, it is very motivating to be in such a place and to be surrounded by such inspiring people. And I know I sound over-the-top, OMG-this-is-so-awesome, American now, but I still mean it.

Some other fun facts about Michiganders is that they love talking about the weather, a lot! Even more than in the Netherlands, believe it or not. When they hear that I come from the Netherlands, their first question is: 'What's the weather like there?', 90% of the time. Another fun fact is how they explain where in Michigan they come from. They don't use references, like 50 miles west of this town, or in the north. Instead, they put their hand up, which has roughly the shape of the lower peninsula of Michigan, and they point on their hand where they are from. And they are accurate about it as well! (see the picture in which I point where I live). And last but not least, they are extremely friendly, always trying to help you out.

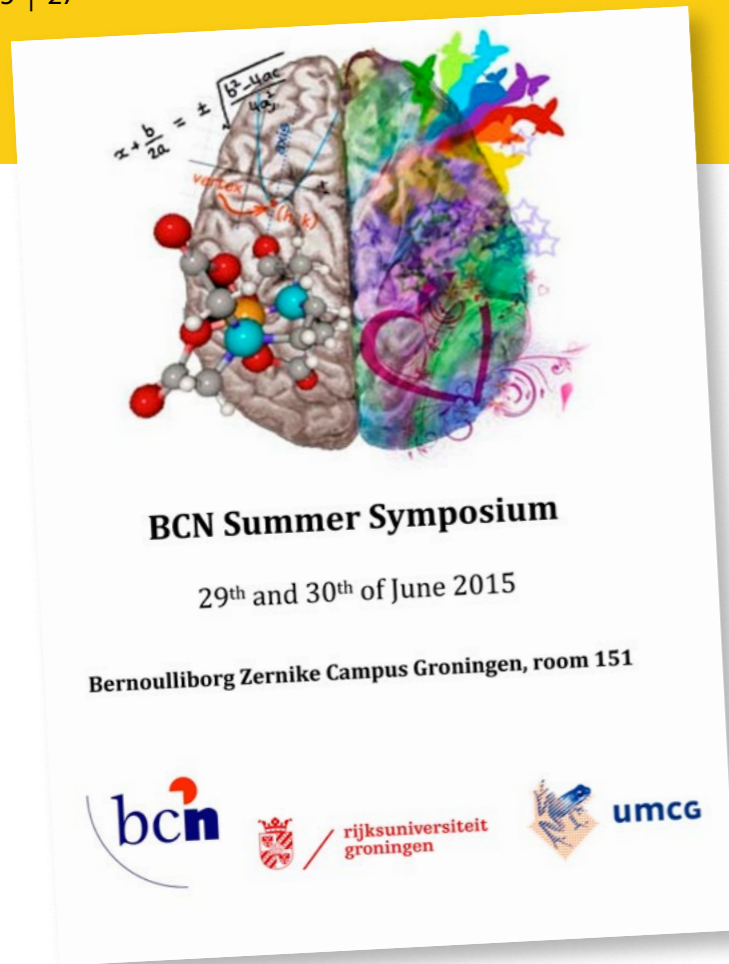
For now, I am going back to Groningen to defend my PhD thesis, and to spend time with friends and family, who I missed a lot during these last few months. But I am sure I will also



miss Michigan when I am in the Netherlands and wherever life will bring me after this adventure. Moving here was the most scariest thing that I've ever done in my life, and I am so glad that I did it.

- BY AMARINS HEERINGA
DEPARTMENT OF EAR, NOSE, AND
THROAT – HEAD AND NECK SURGERY,
UMCG
- PHOTO BY BARBARA HRDLICKOVA





BCN Research Master Summer symposium

> Student chronotype could be an early surrogate measure of student career prospects. <

On the 29th and 30th of June the annual BCN Research Master Summer Symposium took place in the Bernoulliborg. It was a great opportunity for all BCN master students, both first and second years, to share the fruits of their labor with each other, and have a laugh or two. Thanks to a terrific organizing committee, both symposium days were packed with interesting guest lectures, talks and poster sessions. While most students were asked to prepare a poster covering the work they did during their minor- and major projects, 12 students were selected to present their work as a short presentation. To give the whole BCN community a flavour of the research conducted by BCN masters students, the BCN newsletter asked four of those presenters to share their work with you as well.

Academic performance and school absence with respect to chronotype

'Chronotype' quantifies an individual's phase of entrainment. It is calculated as the mid-point of sleep on work-free days corrected for sleep deficit. The distribution of chronotypes ranges from early to late and further varies with age, with adolescents being very late types compared to other age groups. Research has shown that late types are challenged most by early school schedules, compromising their school performance significantly. To expand our knowledge about the effect of chronotype on school performance, we looked at 242 Dutch high school students to assess the effect of chronotype on grades, number of late

>> CONTINUATION OF BCN RESEARCH MASTER – SUMMER SYMPOSIUM

arrivals, sickness absences and educational level (HAVO/VWO). Late chronotypes on average had lower grades and arrived late more often. No correlation was found between chronotype and sickness days. Interestingly, HAVO students had significantly later chronotypes compared to VWO students. The finding of chronotype differences between students in different educational levels is striking and suggests that student chronotype could be an early surrogate measure of student career prospects.

Lana Otto – 1st year B-track

Unraveling the role of domestication in canine cooperation using the loose string paradigm

What has happened in the past 30,000 years to turn the big, bad wolf into man's best friend? Since dogs have been bred to live and work with people, researchers have long suspected that domestication has rendered them more tolerant, attentive, and cooperative than their wild counterparts. While most studies on this subject compare the ability of dogs and wolves to interact and cooperate with humans, it is unknown as to how they differ in their ability to work with members of their own species. Using a classic experimental task requiring cooperation, we tested the ability of similarly raised and kept dogs and wolves to work together with a pack member to gain access to food. Though a clear comparison of dog and wolf cooperative abilities remains elusive, this is the first study to provide experimental evidence of spatially and temporally

coordinated cooperative action in wolves. Our results lend support to the recent "Canine Cooperation Hypothesis" which states that domestication of wolves may have actually occurred due to their already high levels of social attentiveness, tolerance, and propensity for cooperation.

Maiglin MacLeod – 2nd year B-track

Huntington's disease: the role of the molecular chaperone DNAJb6 in glial cells and neurons

Huntington's Disease (HD) is a inheritable progressive motor neuron disease characterized by unsteady gait, uncoordinated movement and cognitive decline. HD is caused by an extended Poly-glutamine stretch within the Huntingtin (Htt) protein, leading to aggregation and eventual neurodegeneration. Molecular chaperones protect the cell by preventing protein misfolding and -aggregation. In this study we addressed the role of the molecular chaperone DNAJb6 in preventing neuronal PolyQ aggregation when expressed in neurons or glial cells. To do this we used a fruitfly-model (*Drosophila melanogaster*) expressing human HttQ100 in neurons and DNAJb6 in neurons or glial cells using the Elav and Alrm promoters, respectively. Expressing HttQ100 decreases lifespan dramatically, shortening the flies lifespan by 30 days. Expression of DNAJb6 in both neurons and glial cells leads to a small but significant increase in lifespan. DNAJb6 can prevent PolyQ aggregation, both when expressed in neurons and glial cells, and rescue HttQ100 induced lifespan shortening.

Rescue in glial cells could be due to phagocytosis of aggregates by phagocytic glial cells.

Niels Alberts – 2nd year N-track

Approaching epigenetics in different states of reactive microglia

Microglia are the resident macrophages in the central nervous system. Microglia priming describes a hypersensitive immune response to mild chronic inflammation which is thought to enhance neurotoxicity in neurodegenerative diseases and ageing. The aim of this project was to determine changes in epigenetic modifications of primed microglia with the help of chromatin immunoprecipitation followed by quantitative real time-PCR (ChIP-qPCR). We investigated histone modifications associated with enhancers and promoters of genes known to be upregulated in primed microglia. Primed microglia are obtained from a mouse model of accelerated ageing (*Ercc1^{Δ/-}*). Unfortunately, we did not find any alterations in histone marks at regulatory elements of genes that are upregulated in priming when we compared wildtype microglia with *Ercc1^{Δ/-}* microglia. Further analysis is needed to identify the histone modification signature of primed microglia. The use of ChIP followed by high-throughput DNA sequencing will give detailed information of histone modification patterns on a genome-wide level in primed microglia.

Laura Nothdurft – 1st year N-track

■ BY WOUTER HUITING

> Domestication of wolves may have actually occurred due to their already high levels of social attentiveness, tolerance, and propensity for cooperation. <

Mindwise: The psychological impacts of extensive smartphone use

Second-year Psychology students participating in the University Honours College follow a mini-course on Blogging Science (within the Thematic Meetings course), in which they learn to communicate science to the general public by means of informing, giving an opinion, and relating issues in science to issues in society. This year a selection of these written blog posts was published on Mindwise. The following is a post by Lenka Wichmann.

Last week a friend of mine told me 'I cannot concentrate at home because there are so many distractions, so I always go to the library to study'. If you ask students nowadays where they get most of their study-related work done, a lot of people will probably give you a very similar answer. However, many of the people sitting in the library are spending a lot of time on their smartphones rather than focusing on their study material.



"How come the smartphone has such an important place in our lives?"

We live in a time that is characterized by rapid developments in the digital world and most electronic devices provide us with many more possibilities than a few decades ago. Just think of the fact that you can easily keep in touch with people all over the world instead of writing letters or walking to the next telephone box to contact people as in the past. But, do we really know how electronic devices are influencing us? Science is beginning to assess the consequences that extensive media use might have, such as its impacts on biorhythms, sleep patterns and possibly cancer risk. Psychological research in particular has just begun to assess the impacts of media use. Some of this research has big potential to teach us how to live with the new media so that it improves our lives without affecting them negatively.



One study examined the relationship between cell phone use and academic performance, which was found to be negatively correlated (Lepp, Barkley, & Karpinski, 2014). A possible explanation is that time spent on the phone is missing in academic endeavors. Another explanation suggests multitasking is the major issue behind extensive cell phone use (Rosen, Carrier, & Cheever, 2013). In general, multitasking robs working memory's capacity and, when responding to emotionally gratifying distractors, a task is approached in a more superficial way and takes us longer (Carr, 2010). Such effects were shown in a study that assessed students' distractibility by electronic devices during a 15-minute study period (Rosen et al., 2013). Results were striking in that most participants did not keep on task more than 5-6 minutes at a time. The most distracted students showed lower academic performance, and students who accessed Facebook one or two times in that time span had a lower grade point average than those not doing so.

>> CONTINUATION OF MINDWISE: THE PSYCHOLOGICAL IMPACTS OF EXTENSIVE SMARTPHONE USE

"Clearly, more media in the workplace and shorter attention spans go hand in hand."

Studies like these show us how we could possibly improve study focus and decrease distractibility. Teachers, for example, are trying to increase students' attention by completely banning smartphones from their classrooms, and hence taking away the external source of distraction. However, this 'out of sight out of mind' approach is not always applicable, since internal distractors still remain. Some researchers, therefore, suggest implementing so called 'technology breaks' to motivate students to delay their craving for phone checking behaviours to certain periods in which access is allowed. In this way, internal as well as external distractions might be overcome. Since it was also shown that students who had specific study strategies were also those who were least distracted, students should, above all, be encouraged to gain metacognitive skills to deliberately control urges for emotional gratification and regulate their cell phone use (Rosen et al., 2013). Indeed, it might well be helpful to develop relevant teaching strategies for metacognition, as evidence is growing that extensive media use (especially Facebook) is not only impacting attention spans and academic performance but also associated with different kinds of psychopathology (Rosen, Whaling, Rab, Carrier, & Cheever, 2013).

For example, unexpectedly taking away or limiting accessibility of smartphones was found to make people feel anxious (Cheever, Rosen, Carrier, & Chavez, 2014). After only 10 minutes, moderate and high users showed increased anxiety although they knew they would get their device back after a short time. This anxiety could be seen as 'separation anxiety' caused by a feeling of loss and a need for reliance on their phones - a phenomenon normally occurring in close

human relationships (Cheever et al., 2014). In a study by Lepp and colleagues (2014), participants reported feeling obliged to stay connected and that this was a burden for them when asked about their cell phone use in general. Being disconnected and fearing missing out on something, however, led to stress and could be seen as another explanation for this anxiety. This made me think: is dealing with this anxiety by using a smartphone causing exactly what people want to prevent when using the phone - namely, disconnection and isolation (as described by Professor S. Turkle of the Massachusetts Institute of Technology in her book 'Alone Together')? How could we then make this paradox more salient to people?

"The anxiety previously described was proposed to be included into the Diagnostic and Statistical Manual of Mental Disorders (the standard tool in psychology and psychiatry for categorizing mental disorders) under the name nomophobia and specified as always carrying around a charger, being stressed by a low battery sign, having the phone switched on 24h, checking the phone constantly, or experiencing a phenomenon called 'phantom vibration' as symptoms (Bragazzi, & Del Puente, 2014)."

In my opinion, these criteria seem rather blurry and would actually describe many young people belonging to the 'i-generation' quite well. Thus, it is really important to find a middle ground between underestimating effects and psychological impacts of media use and over-pathologizing quite normal and (in our times) adaptive behaviour.

What I definitely think is that in this time of constant connectedness in which phones are often the first thing people look at after waking up, are carried everywhere during the day (even to the bathroom), and are the last

thing to be checked shortly before falling asleep, we should rethink the role of the new media in our lives.

"Because, although we might be amused in the short term by this new tweet and that new message that are making our time in the library more enjoyable, in the long run we should definitely watch out for its effects on the most important areas of our lives - health, success and well-being."

■ BY LENKA WICHMANN

Originally published on [Mindwise](#), the blogging platform of the Department of Psychology.



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> PHD COLUMN

Ironic?

It's kind of ironic, and more so than the things that Alanis Morissette is referring to. Doing research on sleep forces you to stay up, keeping your subjects awake and by doing so, not only challenging their but also your own sleep regulation. You can find yourself for hours in a room which is deprived of light and other stimuli that are supposed to keep you human.

Who cares? You have obtained your data! You engage yourself on days without social interaction, nutrients, physical exercise and, notably, sleep, in order to publish your research before your competitors.

Because of your publication, you are invited to a conference in the United States to present your precious data. Thus, sometime later, you find yourself in an airplane, trying to shift your clock nine hours. Very unsurprisingly, this doesn't work. So, you're slightly jetlagged – a nine hour time difference is not nothing, and science still hasn't found a cure (work harder, sleep and circadian biologists.. oh wait). However, you manage to present your work like it's supposed to be: with passion, jumping on and off the stage. You finish your presentation with a catchy sentence: 'We should start to acknowledge that sleeping enough and at the right time of the day is more important than anything else for your health'. However, you forget that you're the one who has the biggest rings under your eyes...



Sleeping too little or at the wrong time of the day can indeed have detrimental consequences on your health. Think about cardio-vascular diseases, cancer and type 2 diabetes. Also, sleeping too little can trigger all kind of psychopathologies. However, the bright side is that once you are depressed, sleep deprivation is actually a very effective treatment- after one night of staying awake, depressed people feel way better! Until...they sleep again.

Sleepless in Seattle...

So how did I end up being fascinated with this phenomenon of which the exact function and underlying mechanisms are still not unraveled? Well, let's be honest: I've always been intrigued by mental disorders. I found, and still sometimes find, it hard to believe that a person, with all their individual traits, is actually just the outcome of a bunch of chemical reactions and connections. The BCN-master in Groningen was therefore a logical choice in order to try to satisfy my curiosity.

With Peter Meerlo as supervisor and Chris Veenker as buddy, we tried to validate an animal model for depression, and consequently attenuate the depression-like symptoms with... sleep deprivation! This was my first experience with sleep research. Although the results were semi-according to our expectations, I learned how to do research, including setting up proper control groups, and how to deal with outliers (I still remember the rat that jumped off the elevated plus maze, always preferred water over a sugar solution and managed one night to magically disappear from his cage). The sleep-seed was planted. In my second research project, I had the opportunity to investigate a hypothesis that would explain the correlation between obesity, type 2 diabetes, and sleep restriction, in the US, Seattle. Our results were not so straightforward, and for the time being labelled 'more research needed'. However, this experience made me more curious about the function and mechanism of sleep, and also opened the door to perform a PhD abroad.

..and Switzerland

It has been almost two years since I moved to Lausanne, Switzerland and I can only recommend it! Research-wise, it's just awesome: the university-density is high, generating a lot of knowledge, including start-ups and associated technological developments. On top of that, Switzerland is definitely not the worst country to do research financial-wise: there are quite some funds which enable scientists to use brand new devices in order to perform cutting-edge research. I am working in the lab of Paul Franken at the UNIL, where I'm currently involved with a project in which we aim to identify the role of clock genes in sleep homeostasis. The devices we're

using to study this are super cool: think of a machine that can measure gene expression in a freely moving and behaving mouse, and think of a wireless electroencephalogram. Imagine that combined, and here we go!

And that's not all. Switzerland is a very pretty country, with possibilities to do all kinds of outdoor activities. The cheese does stink, that is true, but you get used to it. If you want to read more about what kind of drink should accompany your fondue, I would recommend a paper from Heinrich et al., published in 2010 in BMJ. If you already have enough papers to read: drink tea with cheese fondue and the chance of having a cheese-stone in your belly will be the smallest.

Almost there

To get back to the ironic part: Although I've sleep deprived myself for the last couple of years, I haven't picked all fruits of this labor yet. I haven't boarded a plane to the States, and I wasn't the one jumping on the stage presenting my data. But I start to see some possibilities to ruin my circadian rhythm in this way too – and I'm really looking forward to it!

So, to summarize:

- 1) One should sleep enough
- 2) One should also sleep at the right time of the day
- 3) Sleep and circadian researchers are constantly disobeying their own guidelines

I don't know if this is worse than a black fly in your chardonnay, Alanis, but so far, I am having a lot of fun in sleep research – powered by BCN™!

■ BY MARIEKE HOEKSTRA



> GRAND STUFF

- > (Former) BCN members **Jelmer Borst** (Artificial Intelligence), **Jacolien van Rij** (Faculty of Arts, linguistics), and **Gert Stulp** (Behavioural and Social Sciences) have recently received an NWO VENI grant: <http://www.nwo.nl/en/research-and-results/programmes/Talent+Scheme/awards/veni+awards/veni+awards+2015>
- > Online video magazine Unifocus highlights research by experimental psychologist **Jacob Jolij**: <http://www.rug.nl/news-and-events/video/archive/unifocus/0729-unifocus-jolij>
- > BCN Research on alexithymia (the sub-clinical inability to identify and describe emotions) by **Andre Aleman** (Neuroimaging Center) and **Katharina Goerlich-Dobre** (former BCN PhD student) covered by BBC: <http://www.bbc.com/future/story/20150818-what-is-it-like-to-have-never-felt-an-emotion>
- > BCN member and VENI laureate **Martijn Wieling** (Faculty of Arts, linguistics) appeared on national TV, radio, and various newspapers with his research on dialects: <http://www.rug.nl/news/2015/06/30-06-2015-medewerkers-in-de-media-mei-juni>
Also see our interview with him in Issue 93

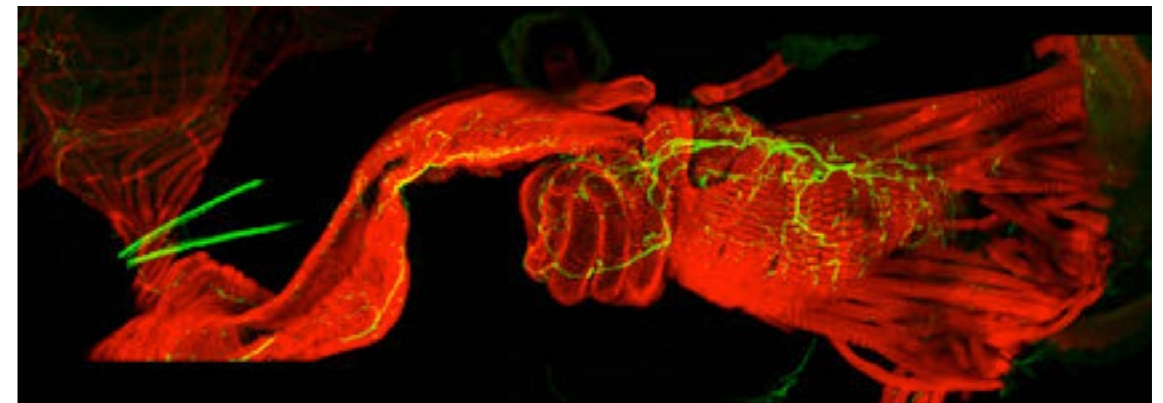
- > **Gertjan van Noord** (Faculty of Arts, linguistics) wins subsidy for 'Common Lab Research Infrastructure for the Arts and Humanities' (CLARIAH) project: <http://www.rug.nl/let/organization/actueel/nieuwsberichten-2015/subsidie-voor-clariah-project>
- > **Conny van Ravenswaaij** (Department of Genetics, UMCG) was interviewed by ZonMW: http://www.rug.nl/research/genetics/newsarchive/interview_met_connyvanravenswaaij
- > **Roelien Bastiaanse** has developed an application for an aphasia test on tablet computers to replace tests on paper, which was covered by Online video magazine Unifocus: <http://www.rug.nl/news-and-events/video/archive/unifocus/the-first-aphasia-tests-on-a-tablet>

- > **Jean-Christophe Billeter**, tenure tracker at the Groningen Institute for Evolutionary Life Sciences (GELIFES) has been awarded first prize for his image "Choosey female" during the "Art of Neuroscience", an international meeting organised by the Dutch Royal Academy of Arts and Sciences (KNAW) and the NIN.

The confocal microscopy image shows neurons (green) that innervate muscles (red) of the reproductive tract of a female fruit fly (*Drosophila melanogaster*). Females use these neurons to influence the storage and use of sperm received from males. This neuromuscular system may be a mechanistic basis for female cryptic choice, a phenomenon in which females exert choice after mating on whose sperm fertilize their eggs. Testing this hypothesis is part of the PhD project of Meghan Laturney at GELIFES, funded by an NWO Open Programma grant.

>> Have you recently received any grants, prizes, or remarkable media coverage? Please let us know (E.T.Kuiper-Drenth@umcg.nl) and we will try to cover it here!

The winning image shows neurons (green) that innervate muscles (red) of the reproductive tract of a female fruit fly.



Cool links

- > Pump Your Career - Talent day for female scientists is organized on November 19 in Amersfoort.

<http://www.nwo.nl/en/news-and-events/events/pump+your+career>

- > Science isn't broken - it's just a lot harder than we give it credit for. Great article describing the complexities of science with an interactive tool to let play around with p-hacking.

<https://fivethirtyeight.com/features/science-isnt-broken/>

- > The Book of Forgetting - an interview with University of Groningen's Douwe Draisma about his latest book.

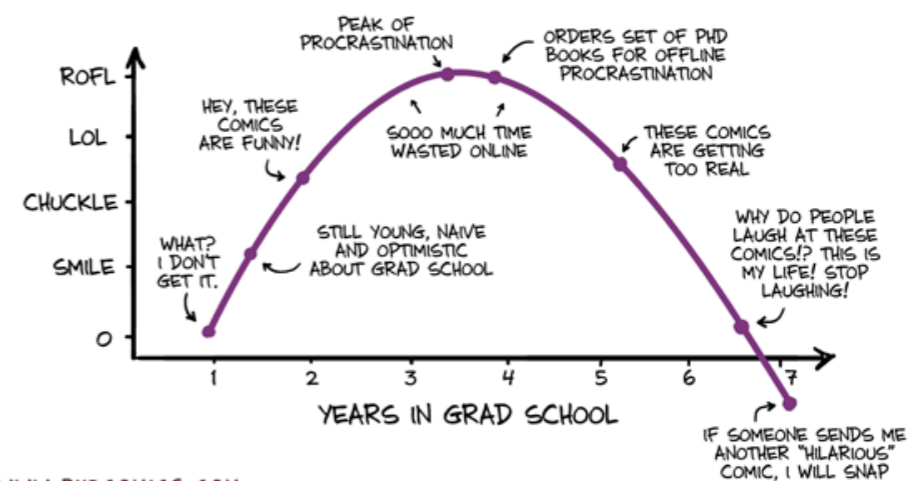
<http://www.scientificamerican.com/article/the-book-of-forgetting/>

- > The Ethical Fourier Transform - a whole new way to solve your ethical conundrums.

<http://www.smbc-comics.com/index.php?id=3831>

<http://www>

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> PROMOTIONS

Wheelchair skill acquisition: Motor learning effects of low-intensity handrim wheelchair practice

PHD STUDENT

R.J.K. Vegter

THESIS

Wheelchair skill acquisition: Motor learning effects of low-intensity handrim wheelchair practice

PROMOTORES

Prof.dr. L.H.V. van der Woude

Prof.dr. H.E.J. Veeger

CO-PROMOTORES

Dr. C.L.C. Lamoth

Dr. S. de Groot

FACULTY

Medical Sciences

Wheelchair users depend on their upper body for mobility during daily life. Handrim wheelchair propulsion is a physically straining form of ambulation as a consequence of a low mechanical efficiency and a high mechanical load on the shoulder complex. The research described in this thesis aims to increase our knowledge about the acquisition of wheelchair propulsion technique for the rehabilitation setting and to improve our understanding of natural motor learning processes. The experiments in this thesis show that practice helps participants to change their propulsion technique, and consequently in lower energy-expenditure. Special attention has been paid to individual differences and the importance of

functional variability in the propulsion technique of individuals during practice. Furthermore, biomechanical analysis showed that, contrary to the reduced energy expenditure, the local load on the shoulder complex increases. Apparently whole body energy efficiency has priority over mechanical loading in the early stages of learning to propel a handrim wheelchair. Finally we attempted to translate some of our insights and methods to clinical practice, towards more evidence-based decision-making. Attention for motor learning processes and the systematic evaluation of propulsion technique during clinical rehabilitation, daily live activities, and adapted sports, are of great importance to



enhance the mobility of wheelchair users and possibly protect them from overuse injury.

Riemer Vegter (1981) studied Human Movement sciences at the University of Groningen. Hij did his doctoral research within the research programme SMART Movements, part of the research institute SHARE of the University Medical Center Groningen. The research was financed by the UMCG and ZonMw. Vegter works as university teacher in the UMCG. He promoted on May 6, 2015 and is a previous BCN member.

■ PHOTO BY WICHER TER VELD

Neural and genetic underpinnings of response inhibition in adolescents with attention-deficit/hyperactivity disorder

PHD STUDENT

D. van Rooij

THESIS

Neural and genetic underpinnings of response inhibition in adolescents with attention-deficit/hyperactivity disorder

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This thesis describes investigations of the neural and genetic underpinnings of response inhibition in a large cohort of adolescents with ADHD, their unaffected siblings, and healthy controls. First, we investigated the neural activation patterns during response inhibition in adolescents with ADHD and their unaffected siblings. We demonstrated reduced activation in these groups in many important nodes of inhibition and attentional networks, and linked this hypoactivation to behavioural differences in task performance and ADHD phenotype.

Next, we describe the functional connectivity patterns underlying response inhibition, and demonstrate that adolescents with ADHD both

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show decreased integration of the response inhibition network, and decreased suppression of task irrelevant networks. Siblings were found to show similar deficits, but also unique compensatory connectivity patterns. The next studies show that several genetic variants from the dopamine and serotonin pathways affect the neural activation patterns during response inhibition. We found that these activation

patterns are predictive of task performance, and that these effects do not differ between the three diagnostic groups. Taken together, these findings provide new insight into the neural underpinnings of the response inhibition deficits observed in ADHD, and demonstrate how these neural correlates can explain additional variance in the ADHD phenotype above behavioural measures of response inhibition. Additionally, these findings suggest that the neural correlates of response inhibition can link genetic variants to neuropsychological performance.

Daan van Rooij (1985) studied Psychology and Cognitive Neurosciences at the Radboud University Nijmegen. He did his doctoral research within the research institute BCN-BRAIN of the University Medical Center Groningen. The research was financed by the UMCG. Van Rooij is working as researcher at the Donders Centre for Cognitive Neuroimaging, part of the Radboud University Nijmegen. He promoted on June 8, 2015.



■ PHOTO BY ROOS VAN ROOIJ

On physical functioning after pediatric burns: Physical fitness and functional independence

PHD STUDENT

L.M. Disseldorp

THESIS

On physical functioning after pediatric burns: Physical fitness and functional independence

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Burn injury has a major impact on children and it seems logical that this would affect children's physical functioning. Yet, it appears that after three months children with burns are equally independent in the performance of tasks of daily living as non-burned peers. Furthermore, their long-term physical fitness is similar to that of children who have not suffered burns.

The survival rate in patients with burns has increased enormously over the last decades, because of improvements in burn treatment and care. As nowadays more patients survive, functioning in the life after burns becomes more and more important.

■ PHOTO BY CARINA DOLFING



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hospitalized for a period of at least 24 hours in a burn centre in the Netherlands. Disseldorp investigated whether the children did, for example, bathe, dress and groom themselves. This was measured at two weeks, three months and six months after the burns. Her study shows that within three months the great majority of children had regained a level of functional independence appropriate for their age.

Physical fitness of children after burns was measured as their ability to perform physical activity. Disseldorp studied aspects such as body composition, muscular strength and exercise capacity in 24 patients aged between 6 and 18, at one to five years after they had suffered burn injuries. Measurements took place in a 'mobile exercise lab' near the participant's home. Her study shows that in terms of body composition, muscular strength and exercise capacity this group did not differ from their unaffected peers.

These results are remarkable, because the existing scientific literature showed that the physical fitness of children is seriously affected by burn injuries. According to Disseldorp, this is largely due to the fact that so far research had only been performed on children with burns involving more than 40% of the total body surface. However, such extensive burn injuries are rare in the Netherlands. In her thesis, Disseldorp also emphasizes how important physical activity is for an optimal recovery from burns. Disseldorp: 'My research shows how resilient children are in the recovery after burn injury. However, we should not overlook the fact that some people do experience physical

limitations after burns and that there are other factors, such as psychosocial consequences, that may impact their quality of life.'

Laurien Disseldorp (Noordwijk, 1987) studied Human Movement Sciences at the University of Groningen. Her research was partly funded by the Dutch Burns Foundation. She promoted on June 16, 2015.

The clock that times us: Electromagnetic signatures of time estimation

PH D STUDENT

T.W. Kononowicz

THESIS

The clock that times us: Electromagnetic signatures of time estimation

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As time is a fundamental dimension of our existence, perceiving the flow of time is an ubiquitous experience of our everyday life. This so-called sense of time is utilized in our everyday activities, for example, when we expect some events to happen, but it also prevents us from taking a morning shower for too long. This ability to perceive time intervals of several seconds has been commonly explained by a pacemaker-accumulator theory positing that some brain

areas create the sense of time by accumulating some sort of neural quantity produced by other brain regions that play a role of pacemaker.

We investigated this theory by recording electromagnetic signals of the human brain to answer if indeed brain tells time using accumulation of its own activity. Several neuroimaging studies presented in my thesis suggest that the process of accumulation cannot be seen as the brain's clock.

I found that accumulation-like traces observed in the brain activity reflect excitation of neuronal populations needed to prepare for an upcoming event, whereas timing ability is preserved even beyond the time when accumulation ends. As accumulation is not responsible for subjective experience of time, this thesis proposes that temporal information has to be provided by another brain process possibly, involving the cortico-striatal mechanisms relying on detection of oscillatory patterns in the cortex or on the dynamics of neural population codes in cortical and subcortical areas.

Therefore, although water flows while we are taking a morning shower, tracking time is more like observing the changing pattern of the nightly sky than just measuring the flow of water.

Tadeusz Kononowicz (1985) did his doctoral research at the section Psychometric & Statistic Techniques of the University of Groningen. He continues as postdoctoral researcher at the Commissariat Energie Atomique in France. He promoted on June 18, 2015.

■ PHOTO'S BY LAURIEN DISSELDORP

The consequences of burn injury can persist in the long term. This is highly undesirable, especially in children, who form a risk group for burn injury and have their whole lives ahead of them. In her study, Laurien Disseldorp focuses on the physical functioning of children with burns. Disseldorp investigated whether these children's physical functioning was affected by their injuries. In this context she studied the patients' 'functional independence' and 'physical fitness'.

Functional independence, which refers to the level of independence in the execution of tasks of daily living, was measured in 119 children up to 16 years of age. All these children had been

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On sound and silence: Neurophysiological and behavioral consequences of acoustic trauma

PHD STUDENT

A.N. Heeringa

THESIS

On sound and silence: Neurophysiological and behavioral consequences of acoustic trauma

PROMOTOR

Prof.dr. P. van Dijk

FACULTY

Medical Sciences

Noise exposure can lead to elevated hearing thresholds and cause ringing in the ears (tinnitus) and hyperacusis, a condition in which normal sounds are being perceived as too loud. At present there are no treatments available that consistently cure tinnitus and hyperacusis, partly because the underlying mechanisms of these conditions are not yet completely understood.

In this thesis the neurophysiological consequences of acoustic trauma are studied. The balance between excitation and inhibition in the central auditory nervous system is disrupted as a result of acoustic trauma. This is in particular the result of a decreased inhibition in neurons that respond to frequencies below the trauma frequency. Furthermore, acoustic trauma causes an increased amplification of the signal in the brain. This was measured by auditory brain stem responses, as well as by neural responses to amplitude modulated sound.

The disrupted balance between excitation and inhibition, and the amplification of the signal

in the brain may underlie neuropathology of tinnitus and hyperacusis. To investigate this, we propose a new method to demonstrate whether an animal experiences tinnitus or hyperacusis.

Our results may contribute to the development of an animal model in which a direct relationship can be established between the neurophysiological consequences of acoustic trauma and the presence of tinnitus or hyperacusis. Such an animal model is relevant for the development of new treatments.



Amarins Heeringa (1986) studied Behavioural and Cognitive Neuroscience at the University of Groningen. She did her doctoral research at the research institute BCN-Brain of the University Medical Center Groningen. The research was funded by the Heinsius Houbolt Fonds, de 'Stichting Gehoorgestoord Kind' and NWO. She now is working as a researcher at the Kresge Hearing Research Institute of the University of Michigan (US). She promoted on June 22, 2015.

■ PHOTO BY JESSICA RIJPSTRA

Cerebral and splanchnic oxygenation and necrotizing enterocolitis in preterm infants

PHD STUDENT

T.E. Schat

THESIS

Cerebral and splanchnic oxygenation and necrotizing enterocolitis in preterm infants

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Medical Sciences

Necrotizing enterocolitis (NEC) is the most common and deadliest gastrointestinal disease in preterm infants. Mortality rates of NEC can be as high as 40%. Furthermore, NEC is associated with adverse neurological outcomes at school age and gastrointestinal complications in the long term, such as short bowel syndrome. Currently, we lack reliable preventive and predictive diagnostic tools to be able to minimize these devastating short- and long-term outcomes.

In this thesis we investigated the potential role of near-infrared spectroscopy (NIRS) in the diagnostic process of NEC. For this purpose we measured cerebral, liver, and intestinal oxygenation values in preterm infants suspected of having NEC and in preterm infants with an increased risk of developing NEC later on. We found that NIRS can be used to identify infants who go on to develop NEC as well as infants with

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established NEC who will develop a complicated course of this disease.

Additionally, we established that a blood pressure dependent cerebral blood flow might be the underlying mechanism responsible for the adverse neurological development observed in preterm infants who survived NEC. This warrants close monitoring of cerebral oxygenation and blood pressure in preterm infants with NEC.

In conclusion, NIRS might be an important method to predict and diagnose NEC timely in preterm infants, and might therefore minimize the adverse short- and long-term consequences with which NEC is associated.

Nynke Schat (1988) studied Medicine at the University of Groningen. She did her doctoral research at the department of Neonatology and research institute BCN-Brain of the University Medical Center Groningen. The research was financed as MD/PhD-traject (Junior Scientific Masterclass) of the UMCG. She now is junior general practitioner. She promoted on July 1, 2015.

■ **EVELYN KUIPER-DRENTH, ON THE BASIS OF PRESS RELEASES OF THE UNIVERSITY OF GRONINGEN**

■ **PHOTO BY BILBO SCHICKENBERG**



> CHEEKY PROPOSITIONS

Your assumptions are your windows on the world. Scrub them off every once in a while, or the light won't come in. – Isaac Asimov

> Riemer Vegter

Een grote rode bus heeft zo z'n voordelen.

> Laurien Disseldorp

Life is like riding a bicycle. To keep your balance you must keep moving. – Albert Einstein

> Amarins Heeringa

The University is not maintained by its alumni, or by the state, merely to help its graduates have an economic advantage in the life struggle; there is certainly a greater purpose to it. – John F. Kennedy

> Amarins Heeringa

Sa ist en net oars, want as 't oars wie, wie it net sa. – Friese wijsheden door Theo Dijkstra

> Nynke Schat

> COLOPHON

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