On fruit flies and the Big Bad Wolf…
Interactive double interview between Sima Chalavi and Jonathan Mall

After four years of hard work, getting to know other people in the department and meeting up with smart people, PhD students have to choose how they will continue their career. Will they stay in science or go in another direction? Sima Chalavi chose to stay in science and started a postdoc in Leuven. Jonathan Mall, however, chose to do something else and started up his own business. For him, business turned out to be less predictable and faster paced than science, but also time-consuming as he barely has time to watch the new episode of ‘Game of Thrones’ now! However, both Sima and Jonathan miss their colleagues the most from their PhD days.

Jonathan
Hello Sima, how are you doing and what are you doing right now?

Sima
Hi Jonathan, I am fine. I am a postdoc researcher at the Katholieke Universiteit (Catholic University) Leuven, Belgium, so I am in my office right now. What about you? Are you still in Groningen?

Jonathan
No, I am standing in my office in Apeldoorn. A screencast of an online presentation for a conference in Sao Paolo (Thursday) is rendering in the background and I was checking some emails just a second ago. So while I sip on the third coffee today, how come you are in Leuven, how did you get that job?

Sima
I see. Well, just before finishing the 4th year of my PhD, I started looking for a job in the field of neuroimaging, somewhere closer to where my husband is (Leuven). Luckily there was an open position in Leuven. I should say I also really liked the project and the lab. Applying for this job was like what I did for my PhD application. I applied for different open positions and then I had to do an interview. For this job, I fit the requirements, and I was offered a position. However, it took me a long time before I started the job as I had to first defend my PhD, so I started my postdoc one year after I was accepted :). Are you still a researcher, Jonathan?

Jonathan
I’d call myself a scientist doing business.

Sima
I know you from my neuroanatomy course. There, you introduced us to a webpage for practicing the course.

Jonathan
Yes, seems like even back then I really liked the idea of providing valuable products and services. Why didn’t you go into business?

Sima
I’d still like to do that. Although I like research, I admit sometimes it can get boring. When did you finish your PhD? And when did you start your business?

Jonathan
The defense was in November 2013 but I was already done in July. We had the idea for the current business (Gumbolt) in June 2013 but started 1 January 2014, when we had all the investors assembled and good contracts. I tried to use the time in between to network in Hamburg - Germany, which may end up in another venture (www.OnTone.de). Business is certainly anything but boring since it is much less predictable and fast paced.

Sima
In brief, what is this business about? Is it related to what you did during your master/PhD studies?

Jonathan
My thesis was about the individual differences in working memory capacity. Gumbolt on the other hand provides clients with business intelligence. In short,
hotels often don’t know who their customers are and what they like. Guests will leave bad reviews even though their problems could have been addressed in the hotel. To solve that problem, we provide hotels the software to survey guests on their own devices and react to their problems quickly. Additionally, if guests provide personal information, we offer them extra services and individualized deals. Hospitality is the first market we want to approach, others may follow (conferences, cruise ships etc.)

Sima
Interesting!

Jonathan
Thank you! What are you doing every day?

Sima
My type of work is completely different than yours. During my PhD I learned different types of data analyses. In my PhD, using MRI scans, I studied brain anatomical abnormalities in patients with dissociative identity disorder (DID) and patients with posttraumatic stress disorder (PTSD). Now in my postdoc, I am using the techniques I learned during my PhD, and also I am learning new techniques to analyse MRI scans. As the brain has always been my greatest interest I enjoy doing this job. May I ask, what did you like most about your PhD?

Jonathan
It was a blast to meet so many interesting people who are a lot smarter than me. The enthusiasm for understanding a cognitive construct is not quite the same as the enthusiasm to make more money.

Sima
I agree :)

Jonathan
Given what you know now, what would you have done differently during your PhD?

Sima
Good question. I think about it a lot. As the topic of neuroimaging was new to me, I feel if I had had more help I could have progressed faster. I feel sometimes we spend time and energy on unnecessary stuff. That, I would definitely change if I could go back. ...What I mean with unnecessary stuff: repeating and repeating some of the analyses while we did not have a specific hypothesis for some of the results, writing and then rewriting, focusing on analysis of some data that were not important for my PhD. I know most PhD students would relate to these issues, but I really wish I could have avoided them.

What about you, are there things you wish you could have changed?

Jonathan
Two major lessons I’ve learned from the time in business: 1.) No reaction doesn’t mean no. There were some opportunities during my PhD which did not come to pass because I did not want to bother people with emails etc. Now I know that no reaction simply means that they are waiting for you to remind them. I’ve heard of cases were investors received 40+ emails from a start-up before responding positively and investing in that company. Until someone explicitly says no, it’s still on! 2.) Your network is everything. Spending time helping others and connecting with them on a personal and professional level is the key to success. Start mingling now, especially with people outside your field and department. Meetup and LinkedIn have many events (often free drinks & food!) to get you in a room with others who are also there to meet new people and connect with them. However, following up on possibilities can be time consuming and it will take some time to recognize and focus on the “good” contacts.

Sima
Interesting lessons :)

Jonathan, are you still working on your PhD papers? Or have you fully focused on your business?

Jonathan
Trying to be focused, but there’s still a dataset with a lot of Facebook data which I am working on sometimes, but nothing that is directly related to my PhD thesis. Trying to build your own business is surely a full-time commitment! Barely had time to watch the new “Game of Thrones Episode” yesterday evening.

How about you, how focused are you on your current project? And what are you working towards?

Sima
As some of my PhD manuscripts are in progress, I am working on both PhD and postdoc studies. But now I feel much more relaxed as the pressure of the defense is gone and I can work without that stress in the back of my mind :)

Jonathan
What do you miss the most from your PhD days?

Sima
I would say my colleagues and supervisors. I worked with them for five years and they became close friends.

Jonathan
The same, I miss those random talks with drunken scientists.

Sima
Thanks to you too for your time and the nice chat. Have a very nice evening :)

Jonathan

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Considerations about Science in Transition

The past few years we have experienced amazing cases of fraud both at the national and international level. These examples cast a bad reputation over science and discredit a very large population of hard working scientists. Both the government and universities have reacted to this issue by adapting their rules in order to prevent fraud and inappropriate data management within their organizations. Of course there are issues that can be improved – we should do our best to achieve an optimal standard on transparency and quality of our research and data management.

There is however another side of the coin: science is nowadays ruled by journal impact factors and citation scores. These numbers are considered the prime and sole parameters of our scientific success, and are used to rate scientists and determine their support and funding. This system has its use, but it also leads to an inappropriate stimulation to achieve more research funding and support. Many cases have shown that this perverse type of stimulation may lead to unacceptable loss of research quality and, in the worst cases, to scientific fraud. We can bluntly state that this unsuitable pressure stimulates a variation of doubtful scientific behaviours, ranging from untidy research and data management up to pure scientific fraud.

One prominent example that reflects the consequences of this inappropriate stimulation is the competition for grants. Recently, the H2020 European grant system has opened and one of its first calls, PHC-1, attracted 1600 proposals. The chance of these proposals to reach the second stage is less than 4%. This means that at least 1536 research consortia have wasted their precious time and money! Measuring scientific impact based on citation rates and impact factors is crucial for grant writing, even though it provides a questionable indication of research quality.

This kind of pressure does not encourage good research practices. In fact, good research only benefits from much thinking, precision and endurance. Clearly we need a drastic cultural change in research attitude, which should be based on intrinsic scientific quality and durability. For our university this is a very difficult move to make since we are in a true rat race with other universities, whether at the national or international level – recall that recently our university was rightfully very proud to enter several international top-100 rankings. If we cut back on our pressure and focus on research performance, other universities will welcome this as a withdrawal of a competitor. However, other opinions are appearing. Many large, significant international science organizations, including the NIH Office of Science Policy, the Union of Concerned Scientists, the Organization for Economic Co-operation and Development Global Science Forum, and in the Netherlands, the Science in Transition Organization, propose novel best practices to guarantee scientific integrity and to prevent scientific misconduct. These organizations offer advice to science managers, universities and governments on strategies to bring science back to durable and integral research that is provided with sufficient money and time. In addition to the improvement of our research and data management transparency, our university would benefit from serious commitment and contribution to this discussion.

BY ERIK BODDEKE
PHOTO BY SANDER MARTENS
BCN Lunch #4 15-4-2014: Publishing - tips, tricks, & increasing your visibility

The fourth BCN Lunch Meeting touched upon a topic relevant to all of us: the scientific publication process. Publishing a paper is a long and tough process, so any information that makes it easier is more than welcome. Therefore we invited two experienced researchers to the Gasfornuis, Jennifer Spenader and Nello Spiteri, to provide us with tips and tricks. Jennifer is an assistant professor of Cognition and Language at the RuG, and Nello Spiteri has been working at Elsevier for 28 years.

How to be successful in academia
In her talk, Jennifer first talked about how to measure success before sharing tips on how to increase your success. She started out by explaining that success is measured both by the quantity and quality of your output. Quantity is usually measured by the number of papers you produce, while quality is measured by the number of citations that you receive. There are two popular measures of success, the impact factor (IF), and the H-index of your papers. IF reflects the number of citations you can expect within two years from a paper you publish in a particular journal. You can find your H-index by ranking your papers according to their number of citations. The number of papers that have a rank higher than, or equal to, their number of citations is your H-index (e.g. if you have five papers with five or more citations, you have an H-index of five).

The number of citations you receive is influenced by the popularity of both you and your topic. It is crucial to make friends in your field, so people will think of you when they’re looking for a citation. Identify who the influential people are and try to informally contact them, for instance through a well-thought out e-mail or during a conference. Also be sure to identify what the important questions are and do trendy research, as this will increase the relevance of your research. Lastly, increase your visibility by having a website where people can find your research and papers. These three points will raise your popularity and visibility. In conclusion, have an impact by researching the important questions, knowing the right people, and sharing your research as much as possible!
What editors and reviewers look for in a paper - A publisher’s perspective

In his talk, Nello shared with us his extensive experience while he systematically went through each stage of the scientific publishing process. First, before writing a paper, decide on the type of manuscript, choose your target journal, and read the Guide to Authors carefully. After this, when writing, be clear and concise; use short sentences and only convey one idea per sentence. Good grammar is essential, as editors will refuse any paper with too many mistakes. Use the standard set-up of introduction, methods, results, and discussion (IMRaD), but also be sure to think very carefully about the title, abstract, and keywords, as these are essential for indexing and finding your paper through searches. The cover letter is also crucial. Be courteous and to the point, make clear why your research is important, and compliment the editor, but don’t overdo it. Finally, in your response to peer reviewers’ comments, respond to every question politely and specifically. Be clear about the changes that you made, and be detailed in your arguments. Editors and reviewers are busy people, so make their lives as easy as possible by following these rules, and hopefully they will reward you by accepting your paper.

Both speakers conveyed their messages clearly and with passion. The main conclusion was that publishing your papers is your way of communicating with other researchers, and that this communication works best if your message is clear, concise, and as relevant as possible. The tips and tricks shared by the speakers will hopefully aid us all in being more successful academics. Be sure to join us for the next BCN Lunch Meeting for two more great speakers helping you to further increase your success!
Third annual BCN investigators meeting

On Thursday March 27th 2014, the third annual BCN investigators meeting was held with diverse but accessible presentations on topics ranging from speech perception (and the Big Bad Wolf) to the neuroimmune system in fruit flies. Speakers were Nathasha Maurits, Mark Nieuwenstein, Etienne Gaudrain, Niels Taatgen, Gregory Mills, Steven Bergink, Ruud Kortekaas, and Pascale Dijkers. The day chairs were Jacob Jolij and Martine Maan.

PHOTOS BY SANDER MARTENS
CONTINUATION OF THE THIRD ANNUAL BCN INVESTIGATORS MEETING
NWO-BCN PhD Scholarships awarded last winter

Recently the Netherlands Organisation for Scientific Research (NWO) has granted the Research School BCN a grant of 800.000,- to attract talented, young researchers from within the Netherlands and abroad to appoint them as PhD students. Interested (Research) Master students were stimulated to choose their own research topic and supervisor, and write their own research proposal for a PhD position within the Research School BCN. BCN awarded the following five candidates with a NWO-BCN PhD scholarship.

Rianne van der Pijl
(Medical Sciences)
Rianne is 24 years old and from the town of Spijkenisse (The Netherlands, near Rotterdam). She studied Bio-pharmaceutical Science at the University of Leiden and during her master started focusing more on neuroscience. She has just started her PhD at the Department of Medical Physiology, investigating microglia phenotypes by time-lapse microscopy, using chimeric organotypic slices. The supervisors to this PhD project are Prof. Erik Boddeke and Dr. Bart Eggen.

Jenke Gorter
(Mathematics and Natural Sciences)
Also from the Netherlands and 24 years old, Jenke will do her PhD project at the Behavioural Biology department. For her master she followed the BCN B-track programme, and she will now continue to study behaviour during her 3-year PhD project on polyandry (mating with multiple males) in Drosophila melanogaster females. Her first aim is to identify genes involved in polyandry that differ between wildtypes via a Genome Wide Association Study. The second aim is to understand the neuronal network by direct intervention in the nervous system. Her third aim is to explain how the conflict between the interest of males and females might have been resolved to support the existence of polyandry. Jenke’s supervisor is Dr. Jean-Christophe Billeter.

Toivo Glatz
(Arts)
Toivo is from Berlin, Germany, and is 29 years old. He did an Erasmus Mundus Master in Clinical Linguistics, at the Universities of Eastern Finland, Potsdam and Groningen. He just started his PhD project at the Department of Neurolinguistics. His research focus will be on serious gaming in dyslexia and developmental reading disorders. He will create several different reading-related tasks that children can play once they get formal reading lessons at school (from about age 6). In addition to the behavioural data, he will use EEG to monitor progress and changes in brain activity in these children. His supervisors are Prof. Ben Maasen and Prof. Natasha Maurits.

Ot de Wiljes
(Philosophy)
Ot is 31 years old and from Hilversum (The Netherlands, near Utrecht). He is a former BCN Master student who completed the C-track in 2010 after doing his bachelor in Biology at the University of Leiden. After his studies he built up a career in information technology, focusing on automated data manipulation and analysis, visualization, and computational modeling. He will start his PhD research this July, which will be a continuation of his major project, and is entitled ‘Skin Brains: Modeling Early Nervous System Evolution in Relation to the Animal Sensorimotor System’. His goal is to update the narrative of how the very earliest nervous systems evolved some 800 million years ago, and to support that narrative with computational models. Ot’s supervisors are Dr. Fred Keijzer, Prof. Jan-Willem Romeijn, and Dr. Ronald van Elburg.

Sanne Brederoo
(Behavioural and Social Sciences)
Sanne is 26 years old. She is from the town Dedemsvaart (The Netherlands, near Zwolle), and did a research master in Cognitive Neuropsychology in Amsterdam. She just started her PhD at the Department of Experimental Psychology. The main focus of her research will be the hemispheric asymmetry of visual functioning. Key to her study is the comparison between young and older adults, as (healthy) aging has been hypothesized to result in a decrease in lateralization of cortical functions. The supervisors to this PhD project are Dr. Mark Nieuwenstein, Dr. Frans Cornelissen, and Prof. Monicque Lorist.
Mindwise - Connecting People

In early March, the psychology department launched a new website at www.mindwise-groningen.nl. I got a chance to talk to Tassos Sarampalis, one of the members of the editorial board that is responsible for the website. The site has a very minimalistic and sleek design in RUG-red and white which emphasizes the content. The content is arranged in three categories: blog, events, and news - with the main focus on the blog. The individual blog posts are a colorful mix of short pieces on various topics from the different fields in psychology. Many of them are a primer on interesting research that is conducted within the department and is written in such a way that they are accessible to the public as well as informative to experts.

The target audience is purposefully wide: prospective students, enrolled students, members of staff, external researchers, and the public. The site's mission is to enhance cohesion within the department and facilitate collaboration and awareness of ongoing research. The editorial board also wants Mindwise to be a place where students can find out more about interesting research they can be involved in, and for members of the public to learn what science grants are used for.

The editorial board currently has six members from different fields and with a range of experience in psychological research. They do their best to use the website as a platform to showcase ongoing research in the department as well as make people aware of upcoming events or other related news.

The site also has comment sections for each entry that make it easy to engage with the authors of the texts, and have already resulted in a couple of interesting discussions. This additional flexibility is the main reason a stand-alone website was launched.

The possibility to update information and add and edit content quickly nicely compliments the RUG website with its more static display of relevant information.

Anyone related to the psychology department in one way or another is invited to contact the blog's editors (by writing to psychologyblog@rug.nl) to make a contribution to the website, either by writing a piece or by helping to develop the platform further. It offers a great opportunity for all of us to engage in the important exercise of science communication and enhances the online presence of the department. Visit the site to learn more about what your colleagues are working on and, more importantly: let others know what you’re working on!

BY FLORIAN SENSE
Brains on the move: BCN Public Event

On Wednesday 12th of March, BCN organized the public event ‘Brein in Beweging’ (‘Brains on the Move’). The event was organized within the framework of the ‘Brain Awareness Week 2014’ at the UMCG in Groningen. Nearly 200 participants, including more than 50 students from high schools in and around Groningen, were present at this meeting. Participation was based on enrollment, which indicated that far more people would have liked to participate.

More than ten principal investigators of the research school BCN gave short, audience-friendly lectures on the various types of research on the brain, i.e. on artificial intelligence, genetics, dyslexia, psychiatry, linguistics, and philosophy.
Hedderik van Rijn (Experimental Psychology) gave an interesting presentation on the subject ‘Does time fly in the same way in humans and fruit flies?’. Using a video presentation, he elegantly showed that fruit flies definitely have a sense of time. Marc van Dijk (‘Deep brain stimulation, how do you do that?’ - Neurosurgery) showed in his presentation a nice example of how deep brain stimulation can be used to treat movement disorders in young children. Roelien Bastiaanse (‘Where do you get it? A search for language in the brains’ - Neurolinguistics) and Ben Maassen (‘Is dyslexia predictable?’ - Dyslexia) gave presentations on correct and incorrect language formation in the brain. Finally, Fred Keijzer (Theoretical Philosophy) gave an interesting presentation on the theme ‘free will’ - ‘My brain and I (about free will)’. During the coffee break, the audience could marvel at numerous demonstrations on the different types of research on the brain.

The next BCN Public Event, ‘Amazing Brain’, will be organized during the University of Groningen’s Alumni Weekend - ‘Trip down memory lane’ - on Saturday 14th of June (14.00-18.00) at Forum Images (Hereplein 73, 9711 GD Groningen).

BY MICHIEL HOOIVELD
PHOTOS BY MICHIEL HOOIVELD

CONTINUATION OF BRAINS ON THE MOVE: BCN PUBLIC EVENT
The Wandering Mind

What motivated your esteemed newsletter editor to invite me to regularly contribute, I am unsure. I am a self-proclaimed optimistic fatalist, therefore my writing is not always of the most cheerful kind. What precisely moved me to accept equally mystifies me. Knowing Sander, I suspect it was a carefully orchestrated attentional blink.

Scientists should focus on opinion-less facts, whereas columnists tend to ventilate fact-less opinions. Therefore, inviting a scientist to write a seasonal column seems a recipe for disaster. I previously wrote a fairly positive metaphorical piece about how great it is to be a scientist looking at the Groninger research climate from afar. This edition, I complain about the depressing nature of academia. As a matter of cognitive dissonance, I hold these opposites to be equally true, so it is only fair to present both views.

When I left for the UK almost two years ago, I was just recovering from a VIDI-grant rejection. Despite great expert reviews, the omniscient selection committee had found it wise to judge my background insufficient. That was reason for me to acutely burn some bridges. I had already spent a year at Harvard, so I knew what it was like to live abroad. Some people love the idea of rambling all over the world; I had found myself to be more of the domesticated kind. But hey, I had gaps in my CV to fill, and as a post-doc you know a priori that job-hopping is part of the job-description. I was lucky to find a project that continued seamlessly from my previous work, so I left my mortgage-laden home behind and packed two bags.

I would say I succeeded in filling those gaps pretty okay. I guest-edited a special issue of Hearing Research, a top-3 journal in the field of – you guessed it – hearing research (I may divulge more about what happens behind the scenes of peer-reviewed publishing some other time). I had supervised PhD students before, but now took on the joint supervision of a junior post-doc. Plus, I gained some experience on a 7-Tesla scanner, a rare machine operated by veritable MRI-wizards. I do not mean to brag, but I'm trying to tell a story here, so adding to that some other strong points including a cum laude, a decent international network, a solid publication record with first-, last-, and solo-authorships, and buckets of praise, I thought myself safe to try another time. This particular grant one can only apply for twice within eight years of obtaining one's PhD, so it was the perfect moment anyway. How happy I was when the external reviews again judged my updated proposal to be excellent; I mean, I wouldn't necessarily call myself a world leader, but a reviewer did! In my mind I was already packing my bags again, this time heading back “home”.

Until precisely one week ago, I received the disillusioning message that the committee again did not see any reason to invite me for the final interview round. I cannot begin to describe how that felt. I am not a sentimental guy, but I was instantly made very much aware of my insula (as in: the disgust centre of the brain). Having been students yourselves, you might recognise that moment when you've come home from a bar a bit more tipsy than you intended to become, and lying in your bed you suddenly feel your mouth starting to water? That is the 5-second warning your autonomic nervous system grants you to run to the bathroom and stick your head in the chamber pot. That is the taste I felt and the emotion that overwhelmed me when I read the verdict (although the liberating climactic regurgitation did not come). For those of you involved in team “love to know”: I am convinced similar networks are involved dealing with heartbreak as with grant rejection. My visceral and nervous systems would have provided a fantastic signal-to-noise ratio at that moment.

One of the most frustrating parts is that I have yet to receive the committee's motivation. I once was awarded a VENI-grant after having been kicked out during pre-selection initially, but appealing this decision in time for it to be reversed is fruitless.

So instead of planning my own research career, I am back scrutinising adverts for research positions again. That is untenured life, I'm afraid. It starts towards the end of your PhD, and ends whenever the three Moirae stop tracing your fibre track.

As a physicist, I know that spins can only be up or down, and there is absolutely no way of knowing which you are going to get unless a state is very well prepared. I fear the same holds for the direction of a science career. Now and then excitation lies in uncertainty; at other times only frustration can be found. I sure could use a 180°-pulse right now.

BY DAVE LANGERS
New staff writers wanted!

Do you enjoy reading the Newsletter? If so, why not join our enthusiastic editorial team and make it even better? Regardless of whether you’re a master student, PhD student, postdoc, or principle investigator, it’s a great way to expand your network, improve your English writing skills, and be actively involved in BCN. Interested? Send an e-mail to Sander Martens, s.martens@umcg.nl!
Cool links

> Explaining statistics through dance: [http://www.youtube.com/watch?v=VFjaBh12C6s&list=PLCkLQQAPoTRhJRUxUY0xThRwfv19jI&index=1](http://www.youtube.com/watch?v=VFjaBh12C6s&list=PLCkLQQAPoTRhJRUxUY0xThRwfv19jI&index=1)

> JoVE, the Journal of Visualized Experiments, is the world’s first peer reviewed scientific video journal. [http://www.jove.com/about](http://www.jove.com/about)


> This paper demonstrates that the average statistical power of studies in the neurosciences is very low, which seriously undermines their reliability. A number of well-established but often ignored methodological principles is highlighted: [http://www.nature.com/nrn/journal/v14/n5/full/nrn3475.html](http://www.nature.com/nrn/journal/v14/n5/full/nrn3475.html)

> Why your friends are probably more popular, richer, and happier than you: [http://www.businessinsider.com/why-your-friends-are-better-off-than-you-2014-1](http://www.businessinsider.com/why-your-friends-are-better-off-than-you-2014-1)

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Help us to raise money for breast cancer awareness!

On June 8th a couple of brave ladies from the ENT research department at UMCG will run 5km to collect money for breast cancer awareness.

Please support our charity run and donate! Information can be found at: [http://tinyurl.com/k0zy8ip](http://tinyurl.com/k0zy8ip)

Or contact: a.luckmann@umcg.nl
The best neuroscience master in the Netherlands is...

BCN! The 2014 Masters Selection Guide has proclaimed the BCN Research Master to be the best Neuroscience Master in the Netherlands. The master scored highest in both quality and student appreciation. Of course we are very proud of that – a clear token of appreciation for everybody who is involved in the BCN Research Master!

Source: http://keuzegids.org/masters

Two BCN researchers starring in Unifocus

“A fruit fly’s concept of time” – Hedderik van Rijn
http://www.unifocus.nl/site/pagina.php?id_item=396&tab=journaals&page=1

“We are not our brain” – Fred Keijzer
http://www.unifocus.nl/site/pagina.php?id_item=395&tab=journaals&page=1

Have you recently received any grants, prizes, or remarkable media coverage? Please let us know (E.T.Kuiper-Drethn@umcg.nl) and we will try to cover it here.
BCN Project Management Course
The BCN Project Management Course has been changed by the course instructors. (See: BCN Newsletter 93, page 17). New BCN PhD students will receive an invitation for the new edition. Only a few courses will be organized in the old edition!! There is an unfortunate misunderstanding: Some PhD students think that they already participated in the course by attending the modules in the BCN Orientation Course. These modules are part of the course! By attending the BCN Project Management Course (old edition) the entire course will be completed.

Booklet: Graduate School of Medical Sciences. PhD Study guide
The PhD Study guide has been sent to all BCN members. The courses within this booklet are free of costs for BCN PhD students.

Online course registration
At the start of the new academic year, BCN will start to use an online course registration system. You will have to use your P-number to login. The first time you will have to fill in a few personal details to complete your account. With this account, you will have to register for BCN and GSMS courses. I will keep you informed.

BCN Symposium
Amazing Brain! This year a special event is organized as part of the celebrations of the 400th anniversary of the University of Groningen instead of the BCN Symposium. During the alumni weekend, leading BCN researchers will give presentations. You are invited! Saturday, June 14, 14:00 - 17:00 hrs. Location: Groninger Forum - Forum Images. PhD students will receive 0.5 EC (compulsory part of the Training Programme) for attending this event.

Interested in EEG?
The Neuroimaging Center organizes a meeting every two months to exchange EEG/ERP expertise, ideas, and research findings. If you’re interested, please mail Hedwig van Oosten (h.p.w.m.van.oosten@umcg.nl) with the request to be added to the EEG mailing list.

Agenda BCN Activities
June 14, 2014
BCN Event “Amazing Brain”
14:00 - 17:00: Location: Forum Images
June 18/19 & 24/25, 2014
BCN Statistics Course
September 5, 2014
Start BCN Orientation Course
Check the website for detailed information.

> CALL FOR QUESTIONS

Dear PhD students,

The BCN Newsletter invites you to send in questions!

Have you ever come across any difficulties during your PhD and do not know who to ask for help? The BCN Newsletter plans to have a question-answer section in which you can ask general questions related to PhD life (confidentially, if so requested). We will select a number of questions you’ve sent in for every issue and try to find the right person to provide answers (or you can suggest a candidate to answer).

Dependent on its success, this question-answer section may become a regular part of the BCN Newsletter. For inspiration, we have already made up some example questions:

a) Doing research is time-consuming. How can you balance work and personal life?

b) As a new PhD, how can you come up with a good research question?

c) I am a second-year PhD and my project is not going very well. I am not sure whether to continue or change to a new project. Could you give some advice?

Looking forward to receiving your questions!
Please send them to l.zhang@umcg.nl.
Attention... and Action!

When my PhD supervisor came into my office two weeks ago to ask if I would be available for a TV program, a couple of things instantly rushed into my mind: curiosity, panic, and excitement. We were involved in another TV show just a few weeks earlier. It was a great experience and it was a nice change of scenery. I, however, did my best not to be on camera and only help out behind the scenes. This time, I would have to be in front of the camera, speak Dutch and would not be able to hide. However, I believe that reaching out to the general public to show them what we are working on and also getting children and students excited about science is important and should be part of our goals. So in the end, I agreed to be part of the show.

Being pretty oblivious to most Dutch TV presenters and BNers (bekende Nederlanders = known Dutch people) sometimes can be very advantageous. If you do not know how well known someone is, the nervous excitement to meet them and work with them is removed. Which does not mean you do not think it is a great opportunity, but it did take the edge off for me and helped make the interaction a bit more natural. I was positively surprised by how open for interaction and interested in our work everyone was. It also gives you a complete change of perspective to explain to someone who has no background in science and is amazed by an EEG or a TMS, something a lot of us encounter these tools in our daily scientific routine.

My part in the piece that would later be implemented in the TV show was to conduct a sham TMS experiment with the presenter. He, however, had no idea that it was a sham set up and came in a little anxious and interested in the set up and the idea behind the experiment. So I actually had to toy act a bit. As if being filmed in the lab and talking Dutch wasn't enough for my nerves.

The experiment had been conducted with several participants as part of a Bachelor thesis, investigating the placebo effect on cognitive performance. Participants were told that stimulating the right side with 10 pulses would not interfere with their arithmetic performance, but stimulating the left hemisphere would improve their performance. Even though no actual stimulation was performed, the idea and knowledge that they should perform better after stimulation of the left hemisphere improved their performance. The same luckily happened during the filming for the TV show. The presenter had the feeling of numbness and pressure after ‘stimulation’ and performed better during the second block, post left hemisphere sham stimulation. Textbook placebo effect: accomplished! But as Albert Einstein already said: “Reality is merely an illusion, albeit a very persistent one”.

I took a few things away from this experience: 1) My Dutch did not break my neck. 2) There is a reason I am working in science and not in the TV business. 3) The reactions from a lay person to your own work can be very inspirational, and even though you may sometimes feel like your work is not important or you are not sure it is worth the hours and hours of input, seeing someone being so excited about our everyday stuff makes you re-evaluate your work. In the end, it is pretty damn cool what we are doing!
Naar ‘personalized medicine’ behandeling van somatische stoornissen


Epidemiologisch onderzoek heeft een aantal risicofactoren voor de ontwikkeling van onbegrepen klachten geïdentificeerd. Dit betreft factoren als stressvolle ervaringen in de jeugd, persoonlijkheidseigenschappen, infectieziekten en ongevalsletsel. Er zijn echter grote verschillen tussen individuele patiënten voor wat betreft het belang van deze factoren voor hun klachten. Iedere patiënt is uniek, maar in onderzoek wordt vaak gekeken naar groepen patiënten waarbij weinig rekening wordt gehouden met individuele verschillen.

De onderzoeksgroep van Rosmalen ontwikkelt een innovatieve benadering, waarin voor individuele patiënten persoonlijke profielen worden gemaakt. Rosmalen: ‘Voor deze benadering meten we een patiënt gedurende een langere tijd op een multidisciplinaire manier, waarbij we zowel klachten als biomedische en psychosociale risicofactoren in kaart brengen. We vergelijken dan goede en slechte dagen van een patiënt en analyseren welke factoren er bij die patiënt specifiek voorafgingen aan dagen met veel versus weinig klachten. Voor iedere patiënt wordt een model berekend dat voorspelt hoeveel last iemand van zijn of haar klachten heeft, en welke psychosociale en biomedische factoren daaraan bijdragen. Op deze manier hopen we tot daadwerkelijke biopsychosociale “personalized medicine” te komen, waarin de behandeling wordt afgestemd op de factoren die bij die specifieke patiënt de grootste bijdrage leveren aan zijn of haar klachten.’
Super Ears

O R A T I E
D. Başkent
T I T E L
Super Ears
L E E R O P D R A C H T
Auditieve perceptie
D A T U M
15 april 2014

Aan oma wordt gevraagd of ze een plakje worst wil. Zij antwoordt: “Ik heb geen dorst.” Dit zou op zich een onschuldig misverstand kunnen zijn waar in de vertrouwde omgeving van de familie misschien zelfs hartelijk om gelachen kan worden. Toch is gehoorschade niet zomaar een gezondheidsprobleem dat zich beperkt tot het verlies van zintuiglijke functies: de gevolgen ervan kunnen verwoestend zijn. Gehoorschade kan de mondelinge communicatie verstoren, de manier bij uitstek waarop mensen met elkaar in contact blijven, en kan uiteindelijk leiden tot sociaal isolement en depressie.

Geavanceerde technologische en klinische hulpmiddelen bieden wel oplossingen in de vorm van hoortoestellen bij slechthorendheid en implantaten bij doofheid. Het effect van een implantaat kan echter per persoon heel verschillend zijn en de geluidskwaliteit via die apparatuur moet nog sterk verbeterd worden.

Hoe kunnen we oplossingen vinden om beter horen bij gehoorschade te realiseren? En als we dan toch bezig zijn, waarom zouden we niet streven naar ‘superoren’? Eerst moeten we onderkennen dat horen een complex neurologisch proces is en dat gehoorbeschadiging een complex gezondheidsprobleem is. We moeten rekening houden met allerlei demografische en etiologische factoren en met de levensomstandigheden van individuele patiënten, en we moeten bovendien begrijpen wat de wisselwerking is tussen het verlies van zintuiglijke functies en andere factoren, zoals ouder worden, het cognitief en psychologisch welzijn en de kwaliteit van leven. Om deze complexiteit te kunnen begrijpen, is teamwork nodig, een efficiënte samenwerking tussen clinici, wetenschappers en patiënten, en tussen de industrie, de academische wereld en andere instellingen. Alleen dan kunnen we de geavanceerde hulpmiddelen aanreiken die ervoor zorgen dat oma haar plakje worst krijgt en ondertussen kan genieten van de rijke variatie aan normale geluiden, zoals het lachen van haar kleinkinderen.

EVELYN KUIPER-DRENTH, OP BASIS VAN PERSBERICHTEN VAN DE RIJKSUNIVERSITEIT GRONINGEN
**Imaging neurophysiology of human sexuality using positron emission tomography**

**PROMOVENDUS**
H.K. Huynh

**PROEFSCHRIFT**
Imaging neurophysiology of human sexuality using positron emission tomography

**PROMOTOR**
Prof.dr. R.A.J.O. Dierckx

**CO-PROMOTORES**
Dr. A.T.M. Willemsen
Dr. J. Doorduin

Vrouwen zien minder tijdens kijken naar erotische films
Wanneer vrouwen naar hoog erotische films kijken, zorgt dat voor een deactivering van de primaire visuele cortex. Zij zien daardoor letterlijk minder, doordat de hersenen minder goed werken. Dat is één van de uitkomsten van het promotieonderzoek van Hieu Kim Huynh, dat hij uitvoerde samen met zijn UMCG-collega’s. Met behulp van PET-scans gingen zij na wat er precies gebeurt in de hersenen wanneer mensen kijken naar en/of denken aan seks. Aan het onderzoek deden twaalf vrouwen en elf mannen mee.

Tijdens het kijken naar films met een neutraal of een laag erotisch karakter gebeurde er niets, maar bij het bekijken van vrouwvriendelijke porno trad bij de vrouwen een deactivering op van de primaire visuele cortex en van de aangrenzende delen van de secundaire visuele cortex. Dit kan volgens de promovendus een fysiologisch effect zijn van seksuele opwinding (doordat er meer bloed gaat naar hersengebieden betrokken bij seksuele opwinding, gaat er minder naar de primaire visuele cortex). Een alternatieve verklaring vormt volgens hem de mogelijkheid dat de context zo evident is, dat een uitgebreide verwerking van het beeld niet noodzakelijk is.

Een andere opvallende uitkomst van het onderzoek is dat er bij vrouwen meer bloed door de hypofyse bleek te stromen tijdens een orgasme. Bij mannen was dit niet het geval. De hypofyse reguleert de productie en afgifte van hormonen. Bij vrouwen zorgen deze hormonen voor samentrekkingen in de baarmoeder en de vagina en een beter transport van sperma naar eicel. Een verklaring voor het verschil zou kunnen zijn dat het mannelijk orgasme een veel kleinere toename geeft van de hormonen oxytocine en prolactine dan het orgasme bij vrouwen.


**Less is more. Strategic restrictions in temporal attention**

**PROMOVENDUS**
S.M. Wierda

**PROEFSCHRIFT**
Less is more. Strategic restrictions in temporal attention

**PROMOTORES**
Prof.dr. A. Aleman
Prof.dr. N.A. Taatgen

**CO-PROMOTORES**
Dr. S. Martens
Dr. D.H. van Rijn

‘Attentional blink’ is strategische keus hersenen om informatie beter te verwerken
Het ‘knipperen’ van de aandacht wanneer we te veel informatie aangeboden krijgen, de ‘attentional blink’, wordt niet veroorzaakt door een fundamentele limiet van onze hersenen,
zoals tot nu toe werd aangenomen. In plaats daarvan is het een cognitieve, strategische keuze van de hersenen. Dat stelt Stefan Wierda in zijn promotieonderzoek.

Wierda stelt voorop dat we via smartphone en tablet overspoeld worden door informatie. Voor wetenschappers is het interessant om te zien hoe hersenen uit die overvloed van informatie relevante informatie kunnen filteren. Dat wordt onderzocht door de hersenen onder druk te zetten. Wanneer mensen in korte tijd zowel veel relevante als irrelevante informatie wordt aangeboden, zijn de meesten van ons niet in staat om alle relevante informatie te verwerken. Er treedt dan een ‘attentional blink’ op. Wierda ontdekte dat dit een strategische, maar wellicht onnodige ‘keuze’ van de hersenen is om informatie te negeren teneinde eerder aangeboden informatie beter te kunnen verwerken. Hij stelt ook vast dat afleiding in een enkele situatie tot betere prestaties leidt.

Wierda beschrijft tot slot een door hem en zijn collega’s ontwikkelde methode om veranderingen in pupilgrootte te analyseren. Met deze methode kan de onderliggende herseninspanning heel gedetailleerd herleid worden. De methode kan zo bijdragen aan hersenonderzoek naar het scheiden van relevante en irrelevante informatie.


Learning to handle a myoelectric upper-limb prosthesis - the development of an evidence-based guideline for training

H. Bouwsema
Proefschrift
Learning to handle a myoelectric upper-limb prosthesis - the development of an evidence-based guideline for training

Prof. dr. C.K. van der Sluis
Prof. dr. E. Otten
Co-promotor
Prof. dr. R.M. Bongers

Hoog percentage armpseudoedragers gebruikt prothese nauwelijks
Maar liefst 20 tot 40 procent van de mensen bij wie een armprostheses is aangemeten, blijkt deze protheses in de praktijk nauwelijks te gebruiken. Hanneke Bouwsema ontwikkelde in haar promotieonderzoek een trainingsrichtlijn om het gebruik van de armprothese te verhogen. Deze richtlijn kan ergotherapeuten helpen om prothesegebruikers beter te begeleiden.

Om het revalidatieproces gericht te kunnen sturen, onderzocht Bouwsema eerst hoe mensen leren omgaan met een armprothese en welke moeilijkheden ze daarbij ondervinden. Daarvoor verrichtte ze metingen van de bewegingen van ervaren prothesegebruikers, en ging ze na welke factoren bepalend zijn voor het vaardighedsniveau van prothesegebruikers. Tot slot bestudeerde ze het leerproces in de revalidatieperiode.
Om meer metingen mogelijk te maken, voerde de promovenda een deel van de studies uit met een prothesesimulator (een prothese voor mensen zonder armamputatie). Er werd geoefend met reiken, grijpen en fixeren, en het doseren van de hoeveelheid grijpkracht – een van de moeilijkste te controleren aspecten van het dragen van een prothese. De uitkomsten van de trainingssessies gaven Bouwsema inzicht in de veranderingen in prestaties, en in de beste volgorde van de oefeningen. Dat leidde tot een klinisch gefundeerde trainingsrichtlijn die gebruikt kan worden in de revalidatieperiode om prothesedragers een zo hoog mogelijk vaardighedsniveau te laten bereiken.


Hemisphere-specific support of visuomotor control in Parkinson’s Disease

PROMOVEDUS
A. van der Hoorn

PROEFSCHRIFT
Hemisphere-specific support of visuomotor control in Parkinson’s Disease

PROMOTOR
Prof.dr. K.L. Leenders

CO-PROMOTOR
Dr. B.M. de Jong

Rechtshandige Parkinsonpatiënten krijgen vaker rechts klachten

De hersenhelft die de dominante hand aanstuurt (voor rechtshandigen de linkerhersenhelft en andersom) is vatbaarder voor het ontstaan van de ziekte van Parkinson dan de andere hersenhelft. Daardoor krijgen rechtshandigen vaker rechts klachten en linksklachten links. Deze ontdekking door promovenda Anouk van der Hoorn verklaart wat tot nu toe niet begrepen werd: waarom de bewegingsstoornis het sterker tot uiting komt aan één lichaamszijde.

De ziekte van Parkinson is een veelvoorkomende neurologische aandoening waarbij een tekort aan dopamine tot gevolg heeft dat patiënten moeite hebben met beweging. De bewegingsstoornis begint aan één kant van het lichaam en blijft ook later aan deze kant het meest uitgesproken. Van der Hoorn ging na waarom dit zoiets is. Zij onderzocht daarvoor onder andere de relatie tussen de meeste aangedane kant bij Parkinsonpatiënten en lateralisatie – het principe dat sommige hersenfuncties (vooral) in de linker- of rechterhersenhelft worden aangestuurd.

De promovenda bestudeerde de gegevens van 4.405 patiënten, en ontdekte dat rechtshandigen vaker rechts klachten krijgen (60%), terwijl linksklachten (60%) vaker links klachten krijgen. In het tweede deel van haar onderzoek bestudeerde Van der Hoorn de verwerking van visuele informatie en de ‘vertaling’ hiervan naar loopblokkades bij Parkinsonpatiënten en gezonde personen. De betrokken hersengebieden werden hierbij geïdentificeerd, waarbij tevens een asimmetrie aanwezig is.

Ontdekkingen kunnen helpen bij verder onderzoek naar de kenmerkende asimmetrie in de ziekte van Parkinson.

Anouk van der Hoorn (Zweeloo, 1986) studeerde Geneeskunde aan de Rijksuniveristiteit Groningen. Zij verrichtte haar
Kikkert stelt voorop dat er de afgelopen jaren steeds meer aandacht is voor lichte neurologische disfuncties (MND). MND wordt vaak pas opgemerkt als het kind naar school gaat. Het kan zich uiten in motorische problemen zoals coördinatieproblemen en problemen met de fijne motoriek, maar ook in een lagere IQ en gedragsproblemen. De promovenda onderzocht of stress en welzijn van de ouders gerelateerd is aan het ontstaan van MND bij gezonde zuigelingen. Daarvoor onderzocht ze 206 gezonde baby’s. Ook ging Kikkert, in onderzoek onder 341 gezonde 9-jarigen, na of er een verband kan worden aangetoond tussen MND, IQ, cognitie en gedrag. Tot slot was ze geïnteresseerd in eventuele verschillen tussen jongens en meisjes met MND.

Kikkert concludeert onder andere dat stress bij de moeder de neurologische ontwikkeling van het kind beïnvloedt. Meisjes die meerdere milde neurologische stoornissen hebben, bleken bovendien ook kwetsbaar voor het ontwikkelen van gedragsstoornissen. Deze resultaten kunnen helpen om eventuele problemen eerder op te sporen en behandelen. Kikkert stelt voorop dat er de afgelopen jaren steeds meer aandacht is voor lichte neurologische disfuncties (MND). MND wordt vaak pas opgemerkt als het kind naar school gaat. Het kan zich uiten in motorische problemen zoals coördinatieproblemen en problemen met de fijne motoriek, maar ook in een lagere IQ en gedragsproblemen. De promovenda onderzocht of stress en welzijn van de ouders gerelateerd is aan het ontstaan van MND bij gezonde zuigelingen. Daarvoor onderzocht ze 206 gezonde baby’s. Ook ging Kikkert, in onderzoek onder 341 gezonde 9-jarigen, na of er een verband kan worden aangetoond tussen MND, IQ, cognitie en gedrag. Tot slot was ze geïnteresseerd in eventuele verschillen tussen jongens en meisjes met MND.

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De bioloog Boonekamp keek in zijn onderzoek ook naar de manier waarop mensen verouderen. ‘Ook bij mensen is telomeerlengte een indicator voor de overlevingskansen. In mijn onderzoek laat ik echter zien dat de mate waarin telomeerlengte overleving voorspelt, afneemt met de leeftijd. Dat lijkt ook zo te zijn voor andere indicatoren (biomarkers) zoals cholesterol, bloeddruk en BMI.’

‘Dat komt omdat het menselijk lichaam te zien is als een redundant systeem, als een tandwiel met heel veel tanden. Als daar een paar tandjes afbreken, als gevolg van veroudering, functioneert het tandwiel nog prima. Pas wanneer er echt veel tanden kapot zijn, werkt het niet meer. Bij versleten tandwielen, bepaalt niet de algehele toestand (het aantal intacte tanden of telomeerlengte bij mensen) zozeer de kans op uitvallen, maar is de kans dat het laatst noodzakelijke tandje kapot gaat bepalend.’

De telomeerlengte en andere biomarkers aan zich lijken dus niet erg informatief voor de levensverwachting, de snelheid waarmee ze veranderen zou wel eens een veel betere maat voor reductantie en levensduur kunnen zijn, stelt Boonekamp. ‘Het aparte is dat onze gezondheidszorg zich juist richt op controle van biomarkers, de jaarlijkse Health checks, zonder dat er gekeken wordt naar de verandering met leeftijd. Mijn gegevens suggereer dat enkel het meten van deze waarden niet zoveel zegt over de resterende levensduur, maar dat de snelheid waarmee deze waarden verslechteren veel meer over de toekomst zegt.’


Multiple sclerosis, remyelination and the role of fibronectin

J.M.J. Stoffels

Our central nervous system functions, among other factors, as a result of myelin. Myelin is a fatty layer of insulation among nervous cells, which is produced by specific cells, the oligodendrocytes. Multiple sclerosis (MS) is a disease of damaged myelin. These myelin injuries (lesions) appear to be largely responsible for the disease burden of MS. Myelin injuries are often permanent in MS, but sometimes they recover spontaneously. This suggests that oligodendrocytes are capable of producing new myelin, but usually do not succeed. What signals prevent oligodendrocytes from producing new myelin in MS lesions?

In this thesis we investigated how the signal molecule fibronectin influences oligodendrocytes. We discovered that myelin injury ‘automatically’ leads to fibronectin production by neighbor cells, including cells called astrocytes. Fibronectin generally promotes recovery of myelin by attracting young progenitor cells of oligodendrocytes. When the progenitors mature to oligodendrocytes, fibronectin is degraded. In MS fibronectin is not degraded, but accumulates en binds to form aggregates. These fibronectin aggregates were found to impair myelin regeneration by oligodendrocytes. In accordance with this finding, fibronectin aggregates are not present in recovered MS lesions. Finally, fibronectin aggregates may stimulate inflammatory reactions of inflammatory cells, i.e. microglia and macrophages. The observations presented in this thesis suggest that interfering with fibronectin aggregation could contribute to promoting myelin regeneration in MS.

**Clinical Observations on Tinnitus**

**PROMOVENDUS**
L.I. Geven

**PROEFSCHRIFT**
Clinical Observations on Tinnitus

**PROMOTORES**
Prof.dr. P. van Dijk
Prof.dr. B.F.A.M. van der Laan

**CO-PROMOTOR**
Dr. E. de Kleine

Tinnitus is generally known as “ringing in the ears”. Tinnitus is the perception of a meaningless sound without an external source, and cannot be heard by others. Transient tinnitus is experienced by almost all adults at some point in their life, but in 8-20% of the general population it is permanent. Up to 1-3% of people with tinnitus are severely affected by it and seek medical attention.

The pathophysiology of tinnitus is unknown. According to current theory it is a central phenomenon in the brain including auditory areas. Some form of cochlear or hearing damage probably initiates the neuroplastic changes in the brain, that leads to tinnitus.

This thesis deals with the pathophysiology of tinnitus, with special emphasis on the efferent part of the central auditory system. The efferent auditory system runs from the auditory cortex to the cochlea, connecting all auditory regions along its path. Unfortunately, we did not discover the cause of tinnitus. We did find that the previously reported asymmetries in metabolism of auditory brain areas are also present in healthy people and they are therefore not associated with tinnitus. We tested the efferent auditory system at the level of the brain stem and did not find abnormalities in its functioning. To explore the complex system of the entire efferent auditory system we suggest several strategies for future research to investigate the role of the efferent auditory system in the pathophysiology of tinnitus.


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**EVELYN KUIPER-DRENTH, OP BASIS VAN PERSBERICHTEN VAN DE RIJKSUNIVERSITEIT GRONINGEN**
> CHEEKY THEOREMS

“Men marry women with the hope they will never change. Women marry men with the hope they will change. Invariably they are both disappointed.” - Albert Einstein.

> Hieu Kim Huynh

The old dogma that women have their maximum number of egg cells at birth has been overturned by White et al.*, who showed that women of reproductive age likely still produce new oocytes, and in doing so, these authors once again proof that certainly, scientists know no certainties. *White Y.A.R. et al. (2012), Nature Medicine, 18, 413–421.

> Josephine Stoffels

“De menselijke hand zal altijd superieur zijn aan welke prothesehand hand ook.”

> Hanneke Bouwsema

“Reproductieve inspanning versnelt veroudering bij kauwen. Als dit bij mensen ook het geval is dan zou de door de Chinese regering opgelegde limiet van het aantal kinderen daar de levensuur kunnen verlengen.”

> Jelle Boonekamp

“Voor een geoefend oog is een afbeelding van een brein nooit compleet in woorden te bevatten. Voor een leek daarentegen zijn beschrijvende woorden voor de afbeelding van het brein vele malen informatiever dan de afbeelding zelf.”

> Anouk van der Hoorn

“I-j könt iemand wel veur, maar niet in de kop kiek’n” - Achterhoeks gezegde.

> Leontien Geven

> COLOPHON

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