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Interview with André Aleman about his book 'Je brein de baas'

Can you explain what the book is about?

The book is basically about cognitive control and about the discussion: Are we a kind of slave of our brain? A view that is present in literature is that unconscious processes in our brain, i.e. processes we are not aware of, guide and decisively influence our behavior. Our conscious thinking does not matter according to this view. Another view is that our conscious thinking does matter. In my book, I defend the latter view by showing that conscious thinking matters and that we can change our thinking and behavior. For example, automatic routines are unconsciously guided. However, we can change these automatic routines by consciously using cognitive effort.

Another point I discuss in the book is free will. The Libet experiment is a very famous experiment in which it was shown that before we consciously make a decision (for example pressing a button), there is a rising waveform in the brain called the 'readiness potential'. The traditional interpretation of this waveform is that it represents unconscious decision making in the brain, preceding conscious awareness of willing to press a button. This is argued as evidence for a lack of

> More than 90% of the processes in our brain is unconscious. Does the small part that is conscious have any guiding role on our behavior and thinking? <



free will because our unconscious processes dictate what we do. I think this interpretation is flawed and incorrect. I also think there is mounting evidence that shows that this is incorrect. There are new studies implying that this readiness potential can occur in our brain spontaneously without even affecting behavior. Second, the potential can be influenced by a conscious decision beforehand. If you give informed consent to participate in an experiment, you consciously decide

to do the experiment and you are in a way instructing the unconscious parts of your brain: we are going to do this. That is when these potentials can start, initiated by conscious decision.

I do not deny there are unconscious processes. Every neuroscientist agrees that more than 90% of the processes in our brain is unconscious. This is not a matter of debate. But the question is, does the small part that is conscious have any guiding role on our

behavior and thinking? I would argue that this is definitely the case. That is a big part of the argument in the book.

The book is written in Dutch. For our non-Dutch readers: will there also be a translation published?

Not at this moment. My publisher does bring it under attention to international publishers. If there is any interest, they will make a translation.

Several books were already written about free will and consciousness, what was the reason for writing 'Je brein de baas'?

The reason was just to give my take on it. I think most other books did not take neuropsychological stands. There is only one in the Netherlands, written by Herman Kolk. It is an excellent book, but he focusses only on attention. I bring some other research to the table as well, not only with healthy people, but also in patients with apathy for example, because we do a lot of research on apathy. Apathy is basically a lack of will, patients lack the initiation of action that healthy people have. So if we are talking about free will, you may also want to look into apathy. I think that the book adds to the literature because there are not so many books defending the role of our conscious intention. There are more books claiming that all our behavior is guided and governed by unconscious processes, not conscious processes. Victor Lamme wrote a book 'De vrije wil bestaat niet', literally 'Free will does not exist'. Dick Swaab made that same argument in 'Wij zijn ons brein' and Ap Dijksterhuis did the same in 'Het slimme onderbewuste'. There is another book, written by American psychologist Roy Baumeister, he describes many examples that our will matters, but it is only psychological research. You could see my book as kind of complementary but more from the perspective of brain science.

Several psychiatric diseases are mentioned in the book. What is the role of consciousness and unconsciousness in psychiatric disorders?

That is a very interesting question because I think unconscious processing plays a major role in psychiatric disorders. For example, in addiction. I think most experts agree that addiction is a problem of unconscious drives that get uncontrollable. However, in many cases conscious processing can play a role in the solution. In addition to therapies that are more geared toward unconsciousness processing, we definitely also need therapies that are geared towards conscious processing. For example, therapies to treat emotional problems where people learn to become more aware of their emotions and learn to identify their emotions. These kind of therapies, focusing on feelings and emotions are conscious therapies. A therapy I discuss in my book is mindfulness, which is very en vogue in the scientific literature and clinical practice. There is more and more use of what people call 'mindfulness based cognitive therapy'. Mindfulness by definition has to do with consciousness, being aware in the moment and being conscious about your thoughts, sensations or breathing pattern. I do think that conscious thinking can play a role in for example, depression, where people have a tendency to ruminate, which is a kind of automatic thought pattern. You never get out of a problem caused by your automatic system without doing some intervention, some conscious intervention maybe.

The book addresses several studies into consciousness. Why is it important to study consciousness and get better insight into it?

I think it is important because it is also kind of hopeful that you are not a slave of your unconscious brain systems, and that a change is possible if you try to look for the possibilities of change. There are some

interesting studies about that actually. People who, for example, want to eat less unhealthy snacks say no more often when they get the opportunity to get an unhealthy snack. Research shows that after a day of already refusing several opportunities to eat an unhealthy snack, the next offer, occurring in the evening when you are tired and already said five times no, you say yes. People differ in their ideas of whether they can say no still in the evening when they are tired. Some people think it is difficult to do this, as you do not have the resources, the energy or the will power anymore. Other people think: if I can say five times no, I can also say no a sixth time. Just thinking that, makes a difference for subsequent behavior. They studied this using an experiment where they changed people's first opinion by giving them a piece of text by a psychologist convincing them they could do it. This resulted in a change in opinion and those people were indeed better in saying no. This is interesting, because if you read books that you do not have free will, that everything is predetermined by your brain structure, it makes you passive and it will actually influence your behavior. Whereas if you read books saying you have free will and can change things, it will actually make it more likely that you show that behavior.

In the afterword, you disagree with some famous neuroscientists about consciousness and the brain. Do you think there will be an endless discussion about consciousness and the brain or will we ever get better insight into this?

There might be an endless discussion, I think. I spoke to a brain scientist who thought it was also a matter of interpretation. There are different levels of explanation, and it differs from what kind of level you reduce from. If you think that explaining things in biological or physical terms is exhaustive, meaning that then you have really explained the phenomenon, then you are more likely to

be a reductionist. You are more likely to give the brain level a kind of decisive influence in your ideas about this line of thinking. In my opinion, the psychological level is a level in its own right of explanation that we need and we will always need, because some phenomena are psychological by nature. Of course, the biological level of explanation is also important, that is why I am a neuroscientist looking at the brain. Studying the brain informs us about the psychological level. However, mental phenomena can never only be explained in biological terms. I think we will always need psychological concepts such as emotion. In some cases, you can explain things by looking at brain circuits or neurotransmitters, but you can never fully explain the differences between emotions by their biological mechanisms. You could maybe compare it to wine tasting. When you have two different types of wine, a very old, good, rich one and a poor one, and you ask an expert to taste them, he has a totally different sensation for one wine than for the other. He will be able to describe it in all kind of terms those people use. A chemist can maybe explain to him the difference in just the chemical structure. The expert will probably say: 'It is nice that you have a formula for this, but there is still a gap between the physical level and my sensations. The richness of this wine is much larger than just this formula that you give'. So I personally think that a gap will always exist. This is not a problem actually, it is an acknowledgement that reality has different levels of explanation, and you may need multiple levels to fully understand a phenomenon.

■ BY MARLIJN BESTEN

■ PHOTOS BY MADAME FORÊT

GIVEAWAY

André Aleman is willing to give away a copy of his book 'Je brein de baas'.

To win a copy of the book, we invite you to make a short comic or cartoon about free will and consciousness.

Winners will receive the book and their comic will be published in the next edition of the BCN newsletter.

Please send your comic or cartoon to: m.e.besten@rug.nl

Moving up in the world: An interview with Prof. Marina de Koning-Tijssen



Prof. Marina AJ de Koning-Tijssen started her medical studies in 1982 at the Leiden University. For her doctoral thesis, she worked for five months as a research fellow with Prof. D.S. Zee from the Department of Neurology at Johns Hopkins University in Baltimore, USA. After finishing her neurology training in 1999, she worked at the MRC Human Movement & Balance Unit, Queen Square, London. She then worked in Amsterdam until 2012 and then moved to UMC Groningen. She received the NWO-VIDI Laureate (2004) for the project “Myoclonic Dystonia: borderland between neurology and psychiatry” and the ZonMW-TOP grant (2019) for the project-” Next Generation Phenotyping: The next move in movement disorders”.

I propose we start today's interview by discussing your academic career. What have been your biggest milestones?

I think my biggest milestone has been the start of my medical career. Choosing to become a doctor. The second step was to work with David Zee on Eye Movements in Baltimore as a student. I learned many things from him, not only how to do research, but also how to enjoy life as a researcher. The next step was my decision to become a neurologist. Before starting my residency in Leiden, I did my PhD on Hyperplexia – people who startle a lot. At the end of my training,

> Our goal is to use machine learning to classify the patients, objectively and accurately <

I went to the institute of Neurology, Queens Square, London that is a famous institute for movement disorders. It helped me decide what I would specialize in Neurology. After my year in London, I worked at the AMC in Amsterdam and received a Vidi Grant, which was a very big step in my career and enabled me to build my own research group. In 2012, I moved to Groningen and recently, I received two big grants. First, the SNN, which is a European grant and second, the Top grant.

A major part of research is around movement disorders. Can you tell me a little bit about the work you do and the questions you are trying to answer?

I work on movement disorders, which involves involuntary movements in neurology. You can have either too little movement like in Parkinson's disease

or too much movement. I focus on the latter. Patients with too much movement like dystonia, i.e. involuntary twisting and postures, and myoclonus, jerking movement or tics. I enjoy diagnosing and treating patients and they form the core of my work. Based on their stories and involuntary movements I develop my questions. I do a lot of translational research to improve the care and treatment for patients. That is the main challenge. In addition, I not only look for motor but also non-motor symptoms, like psychiatric problems.

What are some of the problems you face with your work in Movement Disorders?

In movement disorders, you have to observe the patients. In other words, you have to phenotype them carefully and describe what you see. What kind of involuntary movement am I seeing? Is it myoclonus or

chorea, is it ataxia, or is it a tic? Patients make excessive movements and you have to identify the type of movement, and subsequently, you can look for causes of the disorder. It is essential to answer the first step correctly: what kind of movement disorder do you see? In addition, if you can group patients with similar phenotypes, it is possible to conduct genetic studies. Ultimately, phenotyping is a crucial step as it determines the treatment a patient will receive.

Movement impairments is one of the common symptoms of Parkinson's patients. Does your research benefit them in any way?

Interesting question. We have a big group of people working with movement disorders. My colleague works mainly with Parkinson's Disease. In Parkinson's disease patients move too little. I focus on patients who move too much and chair the European Expertise Centre, where we focus on phenotyping the patients to make a correct diagnosis. It is out of the Parkinson fields but some patients have Parkinsonian symptoms along with other movement disorders. There is an overlap and in this case, I work closely with my colleagues.

Congratulations on receiving the Top grant for your research. Can you tell me a little bit about the project you received the grant for?

Of course! There are different types of Involuntary Movements. In clinical practice, we look at the patient and measure their muscle registrations to identify the movement disorder. Even if we take videos to seek advice from international experts it can be difficult to classify. It is difficult as already said to choose the right treatment, to judge the effectiveness of treatment or search for the cause, if you do not know the phenotype. What we need is to classify patients more objectively and this is the core of my research project. My team and I will take video recordings of patients doing specific tasks and

> I think young people should enjoy their freedom and shouldn't be too serious from 18 years of age. These days it's all so serious. It is important to learn life as well. <



movements. We will also measure their EMG, which is their muscle activity. Ultimately, our goal is to use machine learning to classify the patients, objectively and accurately. With the Top grant, we hope to do PET and resting state fMRI and that information can be added to machine learning to further improve the classification. A difficult issue is 'what is the gold standard?' The videos taken will be shared with international experts in the field. Collectively, we will decide which patients we agree on. It is with this group of patients we will 'learn' the machine. It will be interesting to see if the machine will group the same patients. I am confident that this will benefit many patients and help neurologists who are not experienced in movement disorders. If we develop a video camera that records patients and can classify them, it will improve clinical practice. Currently, it is challenging to identify which parts of the brain are involved in generating involuntary movements. We aim to correlate the homogenous groups of patients with a specific type of involuntary movement to the patterns of brain activity on the fMRI and FDG-PET scans. This will in the future also help with Deep Brain Stimulation, a possible treatment for movement disorders to target optimal brain regions in individual patients.

Is misdiagnosis common in movement disorders?

Yes. Delays in diagnosis are common. Sometimes, the patient has suffered for 10+ years before the correct classification is made. It is difficult whether you are experienced or not, but the more you see the better you learn. That is the reason that many patients are referred to our expertise centre for a second or third opinion.

Does current treatment work on treating the symptom or treating the cause?

Mainly the symptom. It is almost never possible to treat the cause. In my experience, it is important for

the patient to know the cause. There are many causes, including prenatal asphyxia or a genetic defect. This is crucial information to the patient especially for genetic counselling. Sometimes, if you have a metabolic disorder or if there is a toxic cause for the disorder, the cause can be treated. However, that is very rarely the case.

Do you think technology in the form of AI and robotics can help treat patients with MD?

Definitely! That is also the aim of my project. We hope we can. And I am optimistic. What I do as a neurologist is pattern recognition. Sometimes I do not even know exactly what makes me make a certain diagnosis. A machine will be able to recognise the patterns that I do intuitively. Parkinson's Disease is common. However, hyperkinetic movement disorders are relatively rare so it will help to make the right classification/diagnosis.

Are movement disorders common amongst the elderly or is it spread evenly across all age groups?

I would say there is a double curve. The more severe genetic forms usually present at the younger age. A second increase in incidence is seen around middle age with genetic, idiopathic and acquired causes, including Parkinson's and other disorders.

Do you think regular exercise and yoga can help with delay of onset of movement disorders?

I am not sure if exercise can help with the delay. However, neurological disorders are like many other diseases influenced by stress. If you practice yoga, mindfulness and exercise, it helps on multiple levels. It makes you feel better, improves your physical condition and can compensate your disability. I am not sure if you can fix the deficit. However, you can definitely make yourself better by optimizing your reserves.

Do you have any life lessons that you have learned in your time in the academic field that you would like to share? Something that is useful for someone who aspires to be a scientist.

This is a tough one. There is a saying- 'the journey is more important than the goal'. Think about what you really want and what suits you. If you really want a scientific career there may be restrictions but within a certain area choose your topic and go for it. However, take your time to decide what you want. Until your masters, I believe you should have the freedom to do whatever you want. I know many people don't agree with me on this. I encourage young people to enjoy their freedom and not to be too serious all the time. It is important to learn life as well. Explore the world. It will help you to broaden your view and in the end be a better scientist.

Lastly, what inspired you to do your research in movement disorders?

If I start from the point when I became a neurologist then I had to make a choice of what I wanted to do. I was truly inspired by the neurologists and researchers that I worked with at Queens Square, London. Before that, I worked with David Zee in Baltimore when I was around 22-23. He loved life and was a great scientist. This is one of my greatest lessons. It is important to enjoy what you do but also have a good life. I try to create that atmosphere for my PhD students. I encourage them to do other things as well. Organizing a patient day, going abroad or attending international conferences. We go together and have a good time. For them and me it is important.

■ BY NAMRATA RAO MANGINA

■ PHOTOS BY SANDER MARTENS

From the boardroom

A rough outline of BCN's Annual Report 2018 containing the highlights was discussed. It was agreed that the BCN Newsletter contains a lot of useful material and that its editor, Sander Martens, should be asked to help select the relevant items and develop the report's lay-out.

The BCN Think Tank has been a useful platform for discussing current and future developments. Its chair, Raoul Bongers, will be invited to attend one of the board meetings and present a summary of the ideas that have been launched.

The BCN Education Committee still experiences difficulties in organising courses because teachers are often hard to find. This is because in many faculties reimbursement for PhD courses is absent. BCN occasionally tries to compensate for this flaw in the educational system, but its budget is insufficient to overcome all difficulties. The board will discuss the issue with the academic directors of the university's graduate schools.

The former U4 – a collaborative network consisting of the universities of Gent, Göttingen, Groningen, and Uppsala – has been extended to include the University of Tartu (Estonia) and is now called U5. More information about this new member can be obtained from Michiel Hooiveld. The Faculty of Medical Sciences seeks to strengthen collaboration with the University of Copenhagen in the field of public health. A Danish delegation recently visited Groningen.

Together with almost twenty researchers, all from different disciplines, the Netherlands Organisation for Scientific Research (NWO) is organising the very first edition of Life on the 28th and 29th of May 2019 in Bunnik: a brand new, unique, national congress covering the Dutch Life Sciences in the widest sense of the word. Life is meant to connect senior and junior researchers from all different disciplines in the life sciences. Although registration is now closed, it is useful to know the link for future developments (<https://nwolife.nl>).

■ BY FRANS ZWARTS

■ PHOTO BY ELMER SPAARGAREN





't Kon minder! (Not bad at all): Why BCN is the #1 Neuroscience programme in the Netherlands

As you might know, Groningers don't like to brag about themselves. But now it is time to draw some extra attention to the BCN Research Master, as the programme was nominated as a Top-Master-programme for the 5th time in a row, and BCN also came out as the #1 Neuroscience MSc-programme in the Netherlands. These data were published in the latest edition of the Keuzegids Masters in March. One of those Top-programmes is the BCN Research Master that is coordinated by the Faculty of Science and Engineering. It was the 5th time BCN was nominated as Top-programme. We think the key to the success of this programme is dependent on the following three aspects.

Small-scale education

The BCN ReMa, for short, was initiated in 2006, although BCN-courses have existed for quite a bit longer. The goal of the programme was to train neuroscientists in three specializations: Human and Animal Behavioural Neurosciences (B-track), Cognitive Neurosciences (C-track) and Clinical and Molecular Neurosciences (N-track). Next to specialised courses in one of these fields, students also receive interdisciplinary training, in small cohorts of max. 15 students per track. To maintain the high quality and small class sizes in this programme, BCN is a selective MSc-programme where students are selected on their background, motivation and grades by the Board of Admissions.

Interdisciplinary

Students in the programme usually come from disciplines such as Biology, other Life

Sciences- programmes, and Psychology, although students with different backgrounds varying from Movement Sciences and Computer Science can also be admitted. The BCN ReMa is coordinated by the Faculty of Science and Engineering (FSE) but teachers come from five faculties: mainly FSE, Faculty of Medical Sciences and Faculty of Behavioural and Social Sciences, but also courses from Philosophy and Arts can be followed as part of the programme. This approach trains students to think outside 'their' field and come up with interdisciplinary research questions.

Focus on research

BCN-students perform two large research projects during their MSc in research groups at our University, as well as at other universities in the Netherlands and abroad. Most research groups within the BCN research school have had

one or more ReMa-students working in their labs. Also, other courses in BCN are strongly research-focused, which clearly pays off given that around 75% of our graduates continue to doing a PhD. Some of our first graduates are now postdocs or group leaders at universities across the globe. Just to name one: Alain Dekker, winner of the PhD-prize at the winter meeting in 2019, graduated from BCN in 2014. More recent graduates now work on PhD-projects at the UMCG (e.g. Theresa Marschall, Minke de Boer), GELIFES (Kevin Ike, Romy Smit) or Psychology (e.g. Robbert van der Mijn), or at other universities in the Netherlands or abroad.

We think that this unique combination of features helps BCN-teachers to optimally prepare our students for their upcoming (research) careers. Alumni indeed mention that the small groups and the experience the students get during the two master projects really helped them get a head start in their PhD-projects.

One goal for the future is to better monitor our alumni and create a community of (former) BCN-students that, also later in their careers, can help each other by sharing job opportunities or collaborations. For this, we recently started a BCN LinkedIn Group, which already gives a nice impression of current careers of our former students. In addition, the BCN Student Council



plans to organize a BCN Alumni Event every year, as the first one in November 2018 was a success.

We hope you, as a BCN Researcher will continue to supervise our students to maintain the high quality of our programme. We are currently working on a 'project database' for students to choose their research project from. If you have 5 or 6-months projects for students, starting in Jan/Feb, please contact us so we can advertise those.

On behalf of the BCN Staff,

- EVA TEULING (E.TEULING@RUG.NL)
PROGRAMME COORDINATOR BCN
- PHOTO BY MARK WINKEL



> STAFF MEMBER COLUMN

Truth

I recently went to the south of Europe by plane. A friend told me that in order to compensate for the CO₂ footprint, it would be enough to stop eating meat and drinking milk, rather than wait for more energy-efficient and less polluting transport or stop such travels altogether. He is a serious guy and believed what he said because he read about it in a newspaper. I also had to think of this when I myself, read about the recent The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) Global Assessment Report written by a large group of scientists who on the basis of extensive evidence showed that biodiversity is decreasing at an astonishing range, to the detriment of many species - including mankind. Clearly, something drastic has to be done about the way we live and use (or rather, abuse) the resources of our planet. But how should we as

citizens change our behaviors in order to really have an impact? And who is going to guide us when we try? Our own politicians, the EU, the UN, Donald Trump perhaps? In a world full of fake or other types of news, there is a pressing need for science to show us the way. According to the IPBESD report, there are ways in which we could reduce the damage to our environment that we ourselves are creating. But this can only be accomplished if it is supported by many, including our politicians.

The ability to translate scientific findings outside of the scientific community, in order for them to reach a larger audience and have greater impact, is something that many of us struggle with. How do you condense your message into something that is comprehensible and that may have influence (even if it won't save the planet)?

Who is responsible for how this message is received and acted upon? And what can we learn from examples of success or failure in this respect? Not only regarding climate, but also in medicine, psychology and many other fields. The symposium 'Nothing but the Truth' that BCN will organise in 2020 has this translation of science to society as one of its two main topics.

The other, related but different topic is how science develops (or discovers) something like 'truth'. We all know that the wrong hypothesis, analysis or interpretation can twist findings and meaning beyond recognition. Science is competitive and timing is crucial. There is always the sense of needing to be the first to publish something new. However, this is sometimes to the detriment of thoroughness and consistency. Even without fraud, which is probably rare, there

is much to say about how we develop and test theories, and the way we share our work with others to try and falsify it. This is the second pillar of our symposium; what measures have we put in place to safeguard scientific progress and maintain public trust, and how could this be improved?

No easy questions, and we hope for intensive and constructive debate. Why would BCN organise this? Because it affects us all, from different fields and disciplines, and interdisciplinary studies and topics that are at the heart of BCN. You will hear more about this over the coming months. In the meanwhile, I cycle to work, still drink milk, and hope for the best...

■ BY ROBERT SCHOEVERS

The diverse realities of Wim Veling

Professor Wim Veling works at Department of Psychiatry of the UMCG as a psychiatrist and the head of the Psychoses department. He is also a professor at RUG, and, until recently, was the chairman of the Dutch Early Psychosis Association. Given the unconventional tools that Veling uses in his lab, an unconventional form of interview was chosen to discuss his academic career and research interests, but also about what drives him, whom he considers a hero, and what he fears the most.

Who are your heroes in real life?

One of my heroes is the Dutch cyclist Tom Dumoulin. He is very successful at what he does, while being driven by passion and determination, and not the desire to be popular. As a bonus, he's also very fun to watch.

What is your greatest fear?

That my dear ones get hurt, sick, or die.

What do you consider the most underrated virtue?

Tricky. I'll think about that.

What do you consider your greatest achievement?

I shall take this question at face value. I had my inaugural lecture in October. I don't know if I consider that my greatest achievement, but I worked hard and for a long time to achieve that.

I never had a clear idea of what my career should look like. When I started medical school, I wanted to be a psychiatrist, but by the time I graduated I was more uncertain about what I wanted to do. There

were a lot of specialities I was interested in. After graduating, I went to Africa to work as a medical doctor. It was a great experience, but I soon realized that a single doctor can't have a significant impact in such environments, there is not much opportunity for change and development. After coming back, I decided to go back to psychiatry and start doing clinical work. I liked it, and decided to become a psychiatrist. I was already interested in research, so I tried to find a place that would accommodate this interest. There was an opportunity to start doing epidemiological research on the topic of psychosis. I took it. In retrospect, it was a very consequential moment. My training in psychiatry and getting a doctoral degree followed. These experiences, together, are the fundament of my current activity.

Another relevant experience was receiving a ZonMw Veni grant. I applied to get it twice, using the same application. In the first year, I was kicked out in the first round. In the second year, I got it. Luck, obviously, played a major role in getting the Veni



grant. Of course, this has opened many possibilities and given me the chance to start my first virtual reality (VR) project. Before this opportunity, I had only conducted a couple of small pilot studies using VR, and, finally, I had the resources to create a good virtual environment and to investigate whether this approach is useful in psychosis research and treatment. Given my background in epidemiology, I sought to connect the two areas. In epidemiology, it's all about statistical associations, inferring causality being out of reach. Thus, I was looking for other approaches to the same research questions. The way in which I have integrated my epidemiological work and the work on VR may seem naïve. In my epidemiological research, we have found that ethnic minority status, living in neighborhoods with few other people of one's own ethnicity, and

> It's not only more pragmatic to combine perspectives, but it's also the best way to approach reality, as researches and as human beings. <

high population density are risk factors for psychosis. These very broad statistical associations are, however, lacking an explanatory framework. To investigate them, we created virtual environments with increased social complexity and a lot of sensory input, and looked into how people with psychosis react to them. Using VR, we have managed to test the variables that we know are associated with psychosis from epidemiological studies. This research was also crucial in assessing the value of VR as a research tool.

> *If we are to be honest, we don't understand much about the biology behind psychiatric disorders.* <

I'm increasingly excited about virtual reality. Every year its spectrum of applications broadens.

There are two main ways in which VR is relevant to my activity. First, it can be used in research, to study the mechanisms of psychopathology, for example. It has the advantage of allowing to control environments in ways unfathomable in other conditions. Secondly, VR can be used in therapy, where it already shows a lot of potential. If I were to go a bit more in depth in each of these areas, there are several applications of VR that stand out. For example, we conducted a project focused on the relationship between childhood trauma and psychological disorders. Studies suggest that childhood trauma increases one's risk of psychopathology, while the mechanisms behind this are still unknown. We hypothesized that this relationship is mediated by stress reactivity, such that people who have suffered from childhood trauma respond to daily stressors with

more distress. This may have a cumulative effect that increases one's risks for mental disorders. We tested this hypothesis in VR by exposing people to situations that became increasingly more stressful, and found that people with childhood trauma experience more subjective stress and paranoia. I find this to be a beautiful illustration of the potential of VR as a research tool. Another example is using VR to study cognitive functioning, which is usually assessed using pencil and paper tests. VR allows for more ecologically valid measures. For example, cognitive functioning may be assessed by having participants engage in various tasks they would need to perform in daily life, such as those involved in going to a supermarket. The results from such tests are also much easier to translate into actual interventions.

Besides being a versatile research tool, virtual reality is also very valuable in therapy. For instance, it is used in the context of forensic psychiatry in aggression management training. Some of the problems therapies need to tackle in such contexts are the difficulty to engage patients in training programmes, the lack of possibility to conduct the training outside the institution, the culture of non-reactance promoted in forensic psychiatric institutions, and the artificial nature of existing programs. There is a lot of aggression within such treatment centers. Therefore, better interventions that would teach patients to deescalate conflicts are a necessity. In forensic patients, the cause of aggression is largely related to social information processing, such that social signals are interpreted as being more hostile than they are. Patients also have difficulty recognizing their bodily signals indicating arousal, which results in perceiving outbursts of anger as occurring out of the blue. Of course, VR may be used to create provocative situations in which patients have the freedom to explore their reactions without any risks to themselves

or others. We have developed a training program aimed at improving patients' social cue processing, in which patients interact with various avatars and have to interpret their facial expressions. The level of the difficulty may be adjusted and patients receive feedback on their performance. This results in increased self-awareness and improved social skills. Furthermore, in order to improve patients' awareness of their bodily signals, we have added physiological measures, which are incorporated into the feedback. It was very useful for many people to realize that their aggressive outbursts don't happen suddenly, but are gradual. Becoming aware of these changes allows for them to be managed and facilitates self-regulation. The third part of this intervention is aimed at building the skills necessary for conflict management. It involves virtual role plays, in which a therapist plays an avatar with which patients interact.

We have recently completed a large trial testing this intervention on 120 forensic in-patients, which represents 10% of the total population of such patients in the Netherlands. The interviews we had with therapists and patients in the context of this study are promising. Therapists report noticing the patients apply what they have learned in therapy to their daily life, and the clinics want to continue using this intervention, even though we haven't yet analyzed the data and have no formal statistical results about its effectiveness. The fact that the benefits of the intervention are evident is very rewarding. The patients, too, have shared their experiences. Some of them mentioned having difficulty engaging in virtual conflicts, partly because they are used not to react, to control themselves. In this intervention, patients are encouraged to practice even if they get angry, and to learn to work with that. Many patients had difficulties allowing themselves this freedom, maybe because they lack trust in their ability

> Many VR therapies can be used at home, allowing people to manage their own health, saving costs but also increasing patients' autonomy, which is crucial for psychological well-being. <



to deal with such situations, or they were afraid that they would be punished for loss of control. Once this was overcome, many reported becoming more aware of their behavior, of their body, or learning that they have been interpreting social cues in a very extreme manner. Different people appreciated different aspects of the intervention. Of course, some patients didn't like it, because the graphics were poor, or because they had trouble getting vulnerable and reflecting on their behavior.

There are many other applications of VR in therapy. One of them has to do with social cognition and social functioning. Many people with mental disorders have trouble functioning in their social lives. The reason is often a lack of insight into other people's emotions,

intentions, behaviors, and deficient social skills. A VR environment is used to help people train their theory of mind. It involves interpreting the emotions of encountered avatars and engaging in social scenarios that unfold as a function on participants' responses and choices. There are many variations of role play therapies, which can be adapted to the needs of individual patients. There are also interventions with a different format. The stress management therapy, for instance, involves a 360 degree video application that takes one to different beautiful places. We have recently finished a pilot study with 50 psychiatric patients testing its effectiveness in improving momentary perception of stress compared to traditional relaxation techniques. The preliminary analysis suggests that it is indeed helpful in reducing anxiety and stress, and

increasing positive affect. What I appreciate most about this therapy and VR therapies in general, are the implications for self-management. Many VR therapies can be used at home, allowing people to manage their own health, saving costs but also increasing patients' autonomy, which is crucial for psychological well-being. We envision that in the near future these interventions will be delivered on cheap VR sets, on apps that can be downloaded and used at home.

VR therapies also have the advantage of requiring less involvement from the therapists themselves, and don't usually require extensive training. For example, training for the aggression management intervention may only take a couple of days for the therapists. Given that interventions involve many role plays, a

therapist lacking formal training in conversational techniques may even act more naturally in such situations. This allows us to use these therapies on a larger scale. VR therapies are also very versatile. Changing patients' paranoid beliefs using traditional conversational therapy is difficult and rarely successful, while in a VR environment patients gather evidence themselves. An example will be more illustrative of this. We had a patient with severe paranoid delusions, to an extent where grocery shopping was impossible. To address this, we started the VR therapy with an empty supermarket. After several sessions, when the arousal level decreased, the number of avatars in the supermarket was gradually increased. Ultimately, the patient felt comfortable in the virtual supermarket. Of course, one may wonder whether such results generalize to real life. As it turns out, patients get curious as to whether they can replicate their VR experiences in their daily life. Without being asked to do so, many report actively confronting their fears and being more comfortable to do that due to the VR intervention. They gather evidence against their paranoid beliefs. In terms of the longevity of effects, studies we have conducted suggest that the effects are still present, somewhat to a greater extent, even 6 months post-therapy. I also have some anecdotal evidence from my patients, whom I have asked two years after therapy about their progress. They reported still benefiting from the therapy.

> *Patients get curious as to whether they can replicate their VR experiences in their daily life.* <

One may wonder whether being in a virtual environment has negative consequences on patients' well-being, especially in the case of such vulnerable populations as those suffering from psychosis. In the moment, being in a virtual environment does elicit negative affect. This effect is part of the interventions. You want people to experience stress and learn to deal with this. We didn't record many side effects otherwise. Some patients, about 10%, may get cyber sickness, which involves nausea and dizziness. One patient got hallucinations of the avatars encountered in VR while being at home. The patient, who was quite lonely, reported enjoying the experience. However, in extreme cases of psychosis using VR is not advised, since the patients will also have psychotic ideas about the virtual reality.

The main theme of my research is the interrelation between social contexts and psychosis. I am pursuing three lines of work. First, I study epidemiology. I think it is important to study large numbers and investigate associations between various factors. Second, I am involved in global mental health, which involves various mental health projects in lower income countries. Third, I conduct a lot of experimental work involving VR. Diverse social contexts are valuable in helping us understand more about different psychiatric conditions. For example, we have one project in the rural areas of South Africa. There is no formal health care there, so we collaborate with traditional healers. We found out that all traditional healers have hallucinations themselves, which challenges our concepts of psychosis. While we pathologize hallucinations, for these healers they are a channel of communication with the ancestors. These observations boil down to the conclusion that psychiatry is too medical nowadays. If we are to be honest, we don't understand much about the biology

behind psychiatric disorders. There were a lot of promises in this sense 20 years ago, when the genomic era and brain imaging era began. Nevertheless, they haven't fundamentally changed our understanding of psychopathology. Moreover, by framing mental disorders medically we tend to forget the social aspect of the issue, which is at least as important. There is this cyclical trend in psychology in which the primacy is given to either biology or the environment, the old nature/nurture debate, in some sense. We have had a period in which a biological outlook dominated psychiatry, which has been disappointing once again. Now, there is a tendency for the social domain to be recognized as important again. What I hope, is to be able to cross the bridge between the two and stop polarizing. I hope my research contributes to this end: the work I do in epidemiology, in global mental health, and the experimental VR work. In the end, it's about translating our knowledge into effective therapies, which I think these three dimensions allow me to do.

Clinical work, similarly to research, is about using various means and methods towards the same end. For example, I think classification systems like the DSM are very limited. However, imagine the chaos in diagnosing before these classification systems were the norm! Everybody was making diagnoses up on their own terms. A lot of people were diagnosed with schizophrenia in the US, even if they had symptoms of burn out. In Europe, there was a German tradition that had to do with dementia praecox, a very cognitive take on psychopathology. Classification systems like the DSM have helped a lot by unifying clinical standards and understandings. Having mentioned that, it is, of course, not a very valid system. Patients within one diagnostic category are very heterogeneous, and there is a lot of comorbidity, which is an artefact of this diagnostic system. Disorders co-occur all the time, which doesn't



make this system very useful. The network theory is an interesting approach to psychopathology, since it doesn't presuppose underlying categories. It just involves a network of associated symptoms. I think it's too early to judge the quality of this theory. And even though we also use network theory in a lot of analyses, it proves complicated in several ways. For instance, symptoms have to vary over time if one is to find correlations between them. To link back to the idea of using different means towards the same goal, what we do in clinical practice is use a three-part diagnostic process. First, we use the classification system. I tell my patients it's only a minor part of the process. One may meet the criteria of a disorder but that doesn't say much about what approach to treatment should be taken nor about one's prognosis. It's not very helpful. Second, we use dimensions. We look into what kind of symptoms people tend to have (for example, one may have hallucinations, delusions, and mood problems) and we rate these dimensions in severity and make a graph. This allows patients to see the dynamic and dimensional representation of their condition. It's much easier for patients to understand and relate to this kind of description, and it also results in treatment directions more easily. Third, we need an individual diagnosis. We ask: Why did this particular person developed this problem at this particular time? The answer involves genetic factors, environmental factors, life stressors, aggravating factors. These three parts of a diagnosis result in a more comprehensive picture. It is a more complicated process, but it is dangerous to simplify such issues.

I think one of the problems we are facing both within the scientific community, and more generally, is that people usually make reality seem too simple. There is a tendency to choose either this or that technique or idea. That's never the case. It's

not only more pragmatic to combine perspectives, but it's also the best way to approach reality, as researchers and as human beings. That may be one of the biggest challenges for researchers: to combine these perspectives. This means one needs other disciplines and other people, one needs to collaborate and integrate. I think that's what we have to do over the next years. That's also one of the most difficult things to do, and for me, it's also the most interesting thing to do. I would get bored if I had to only focus on one particular subject. It's easy to lose sight of the bigger picture. I feel much happier inhabiting a broader research area.

Returning to the question in the beginning, maybe, then, the most overrated virtue is decisiveness, certainty. I think it's better to be nuanced. It's an uncomfortable position, and it may give the impression that you are weak and can't make up your mind, but I think it's better.

What is your motto?

Follow your passion.

Which historical figure do you most identify with?

I really like the 19th century in terms of the personalities it gifted science with, such as Darwin. I admire and embody their connection to nature and to the scientific endeavor. They used to travel the world collecting all kinds of information, making classifications, trying to capture the complexity of the natural world. It was a very optimistic and inquisitive time.

■ BY VALERIA CERNEI

■ PHOTO WIM VELING BY JEROEN VAN KOOTEN

Intro new copy editor



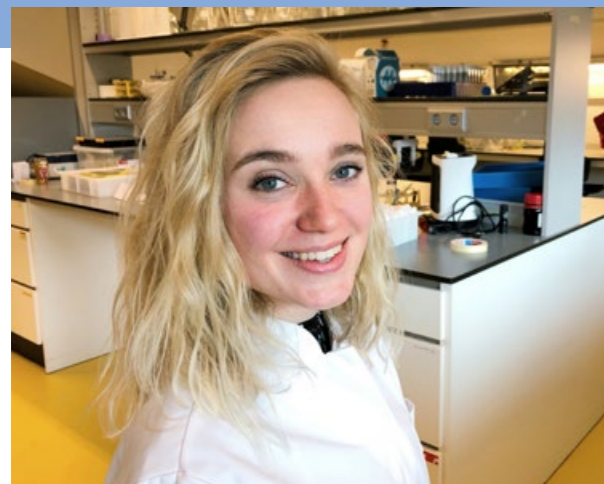
> **ABIGAIL TOTH**

When I first started my bachelors at the University of Alberta in Canada, my goal was to become a speech therapist. During my studies, I was fortunate to have the opportunity to work as an educational assistant for children with autism. It was then that I really became fascinated with language. Why can something that comes effortlessly for so many of us, pose such a challenge for certain individuals? For most people acquiring a first language seems to be effortless. We come into this world and in just a few short years we are able communicate with those around us, expressing our wants, our needs and maybe most importantly, our feelings. It is as if, it is language that makes us human. However, when it does not work this way, we realize just how complex language is. Something that you may have experienced when trying to learn a new language. Even once you feel like you have mastered a new language, you can never seem to express yourself in the same way that you can in your first language.

Throughout my bachelors I began to realize that I really wanted to understand how it is that we acquire language and what are the different mechanisms involved. It was not only that I had a lot of questions, but more importantly that I wanted to find the answers. I decided to pursue a master's in linguistics, during which I investigated how children follow naturalistic discourse using eye-tracking. After my masters, I moved to Groningen to pursue my PhD in the department of Artificial Intelligence. A decision that I made not only to grow as an academic researcher, but also because I think it is important to experience new environments, people and cultures. Not being in a traditional linguistics department has definitely put me outside of my comfort zone. However, I think it is when we are outside of our comfort zone that we are able to learn most. Having the opportunity to work with people from various academic backgrounds has provided me with a new set of skills and also helped me think about my research from different perspectives.

As the new copy editor of the newsletter, I look forward to being more involved in BCN and getting to further collaborate with individuals in a multidisciplinary setting. And also, it will keep me up-to-date on all the cool things going on in BCN!

■ PHOTO BY SANDER MARTENS



> MASTER STUDENT COLUMN

From sculptures to science - Franciska de Beer

psychology and worked hard to understand the subject better. I even enjoyed the statistics in social sciences. However, psychology can sometimes be vague and I was looking for a detailed method to study the human mind. The BCN program was a great fit for me since I could combine molecular or computational techniques to study concepts in psychology. I belong to the C-track but there are no boundaries. I can take classes in any track even if I don't have the 'background' for it."

What is your current minor thesis about?

"For my minor thesis, I decided to focus on a very basic behavioural concept: decision-making. Decision-making is as primal as sexual reproduction and is observed across most animal species. A famous model is the Ratcliff's Drift Diffusion Model. Although there is behavioural evidence for this, there is a lack of neural evidence in humans. This is partly because of methodological limitations, but also the complexity of studying it in humans. While sitting in Jean Christophe Billiter's class on fruit flies, I wondered if I could study this concept in a fly model. His enthusiasm and support motivated me to study this without any prior experience in the lab. I am currently working with Thomas Verschut as my daily supervisor and Marieke van Vugt who helps me with computational modelling."

What fascinates you most?

"To me, one of nature's biggest marvels is the human mind. I am fascinated by the unpredictability and the wide spectrum of human behaviour."

Why did you decide to move to the BCN program from art history?

"I did a bachelor in Arts Culture and Media. However, towards the end of my bachelors, I was unhappy with the opportunities this field of study presented. Fortunately, I took a course in cognitive psychology, which marked a turning point in my life. I was so captivated by the subject, that for my bachelor thesis I decided to explore how art is perceived by its audience. An art piece evokes an emotional response that is unique to every individual. Interestingly, even though art experts believe that they appreciate art more than others, studies show that they can be biased by the artists' name. The 'naïve' audience is more critical of art. From this whole experience, my biggest takeaway was my love for research. I decided to do a premaster in

If you're interested in human decision making, why would you study fruit flies?

"One may think that the fruit fly is a poor model to study human behaviour. However, we share about 70% of our genetic make-up! We are both able to process information and make fast decisions. Something, which even bacteria do. I believe, the brain was developed once and these mechanisms have been evolutionarily conserved. Obviously, I am not focusing on language, which is more complex and cannot be studied in fruit flies. However, for decision-making, fruit flies are a great model. In addition, they are predictable and easy to manipulate experimentally, which makes it easier to work in the lab."

How has your experience in the BCN master been so far?

"In the past few months, I have experienced a great learning curve. I may have ended up as a museum curator if it was not for the cognitive psychology class in my bachelors. Sometimes the workload can be high and to be fair I am terrible at balancing my work and personal life. Thank god, my boyfriend keeps me in check."

Where do you see yourself in five years?

"Five years down the lane, I do not know where I will end up with this study. My interests change often and I would like to keep my options open. However, I do know I will definitely get a dog or a cat, or maybe both."

Who inspires you the most?

"There are some people who really inspired me to pursue this field. I was acquainted with Antonio Damasio, a neurologist working on how emotions can be connected to artwork. His work motivated me to look at art differently and trained me for psychological research. The second one is Daniel Kahneman. He has done a wonderful job in investigating heuristics. On one hand, they are intuitive and on the other hand, they are emotional. It is interesting because humans can be irrational. Lastly, the teachers who taught cognitive psychology, Hedderik van Rijn and Ritske de Jong were incredibly good teachers. Their enthusiasm was contagious."

If you could describe yourself in one word.

"If I could describe myself in one word, it would be curious. I find joy in learning."

What fascinates you most about humans?

"In philosophy, there is a concept called mimesis - the ability to not only imitate someone, but to create your own version of something. It perfectly describes human behaviour because we are able to express ourselves in our own unique ways through our conscious mind. Our brain weighs 1 kilo but it is capable of so much more. Someday, I hope to unravel the mysteries of this magnificent creation."

■ BY NAMRATA RAO MANGINA

On the Peer Reviewers' Openness Initiative: Why should I care?

Science is the driving force behind what we consider reliable knowledge, and it usually works like this: a scientist has a theory, formulates a hypothesis that derives from this theory, designs a study to test that hypothesis, and, in the end, draws a conclusion regarding whether the initial theory was supported by that study – either through a controlled experiment or by a series of systematic observations. As more scientists become interested in studying the same phenomenon, this process becomes a cycle: the initial experiment is replicated (or closely repeated), and new modifications of old theories are posited that afford their own experiments.

This cyclical process has led to the accumulation of knowledge that we now rely upon. In that, a major role is also played by the trust that scientists have in the validity and truthfulness of each other's work. Trust allows one to pick up the research from the edges of the current knowledge-base and work towards extending these limits, with the critical assumption that

this is a reliable platform on which to build one's own research. A break-down of trust, on the other hand, tends to feed societal polarization, with different social groups inhabiting intellectual discourses that don't seem reconcilable (Merton, 1972). Scandalous cases of research fraud, such as that of the Dutch psychologist Diederik Stapel, or, more curiously, instances in which scientists test the rigour of the publishing system by submitting (and having published) articles salted with nonsense (see the Sokal affair), become famous to the scientific community and the public opinion. These cases then threaten the trustworthiness of scientific findings, and of science itself, being indicative of a lack of solidarity in upholding the ethical standards of the scientific community.

In addition to such egregious – though rare – instances, there are various questionable research practices that undermine the perceived role of science, such as manipulating one's statistical analyses in ways that lead to significant results, deleting or adding



participants for the data to fit one's theory, or using small and unrepresentative samples of participants. Scientists are motivated to engage in these practices due to the selective publishing of only significant results in most scientific journals, and the pressure to publish one's work in such journals in order to maintain one's position in academia.

The consequence is that reported results are sometimes not valid. Thus, for example, only 36% of the classical studies in social psychology were supported by a subsequent replication (Pashler & Wagenmakers, 2012). This suggests that most of what represents the actual

knowledge-base in this field is a false positive. Given that the trustfulness of the scientific endeavor is negatively affected by each such case, various practices are being introduced to protect trust in science by maximizing the quality of research that gets published in scientific journals.

A possible avenue to better research quality is increased transparency: researchers might grant the scientific community access to their data, analyses, and materials (e.g., Archives of Scientific Psychology). This would allow other researchers to assess the quality of their peer's findings and form an informed decision about



their validity. Even though most members of the scientific community acknowledge the benefits of implementing greater transparency, this practice is still in its early stage. The reasons for this are various: the necessity to learn open practices, the perceived delay in the publication process that they may cause, and the possibility that one's competitors will use the shared materials without adhering to open research practices themselves.

In order to address this dilemma – the conflict between the possible benefits of open practices on the research quality, and its possible drawbacks on one's professional activity – the

Peer Reviewers' Openness (PRO) Initiative was created. This initiative proposes changes in the peer reviewing system so that it promotes open research practices.

Peer reviewers are scientists who assess the quality of their peers' research papers before their publishing in scientific journals. Some of their responsibilities include checking whether the study meets the field's theoretical, experimental, and statistical standards. The PRO Initiative therefore proposes that a new standard of openness should be included and assessed by peer reviewers. Researchers would then be expected to either grant open access to their

data, materials and analyses, or – importantly, in terms of promoting transparency as a kind of openness – provide a justification for the lack thereof. Not meeting these conditions would result in reviewers withholding comprehensive review, and the paper not being recommended for publication.

Signing on as a supporter of the PRO Initiative is a commitment to apply the openness standard to one's activity as a peer reviewer. Even though there are difficulties that might be expected to arise from implementing this standard – such as those related to changing one's research habits, the need to educate young generation of scientists in this matter, and the possible ethical issues about sharing data or materials – these are outweighed by the benefits that its implementation is expected to generate once openness becomes a well-established element of scientific conduct.

As a consumer of science, either communicated directly through the peer-reviewed scientific literature or through the media, it is important to be aware of the challenges that the scientific community faces in order to be able to discern between reliable and unreliable findings. The persuasive power that the scientific aegis confers to otherwise not very plausible statements is a widely-used marketing tool, to which many have fallen prey. In exploring what is known as knowledge, one has to realize that science is a social endeavor not without flaws,

and take its fruits with a grain of salt. Moreover, one has the epistemic responsibility of checking, whenever possible, the validity of what one learns. Open research practices come as an acknowledgment of both the imperfections inherent to the system we have chosen to use in order to explore the world, and our responsibility and preparedness to perfect our mechanisms and collaborate in creating a more reliable and comprehensive picture of reality. And that is why you should care.

■ BY VALERIA CERNEI

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The art of science: When science and art collide

A text inspired by Notes on Synchrony, a collaborative project between dancers and neuroscientists in which art and science merge. Notes on Synchrony was in the Groningen Grand Theatre as part of the Moving Futures festival on the 16th and 17th of March.

Which of the following words do you associate with art, and which ones with science? Experiment, question, knowledge, exploration, creativity, failure, measurement, precision, dedication, passion, effort, meaning, humanity. Most people imagine art and science as fundamentally different. On the one hand, there is the systematic and methodical world of science, inhabited by specimens of outstanding rationality and discipline. On the other hand, there is the chaotic world of the arts and its vibrant, sensitive, and exuberant personalities. Certainly, this is a sketch of the more extreme images of science and art. The more contact one has with either of the two, the more nuanced this image becomes. There are scientists who don't wear lab coats – the majority of us, actually – and there are artists who are not tormented by the capricious appearance and disappearance of the muse, but methodically follow work routines and rigorous methods. Even though at individual levels it is easy to admit that artists

and scientists may share methods, ideas, and ideals, the step of generalizing this into the public perception of art and science has not yet been undertaken.

The discussion that science and art are alien to each other is not new. Some place its origin in Charles P. Snow's 1959 lecture "The Two Cultures", though it is probably as old as the two formal fields of activity. In his lecture, Snow suggests that the intellectual life of Western society is split into two cultures – science and the humanities – whose people, for the most part, don't speak each other's languages and don't share each other's methods. This perspective is deeply engrained in the public perception of art and science, according to which the two seem to lead independent lives.

One of the main reasons for this schism may be that both art and science have an esoteric feeling about them. We are used to being exposed to their products, not their



processes. We look at paintings, watch dance performances, or read poems, just as we find out about new treatments, gadgets, or the latest update on how global warming is progressing. What is in the space between the absence and the presence of these intellectual products? While the process of making art is portrayed as an artist's intimate search for meaning, differing from artist to artist and impossible to synthesize in a formula, the process of conducting science is, on the contrary, illustrated as an

impenetrable formula. Lacking the knowledge on the processes of art and science, the public is left with their bare products, which it uses to discriminate between the two. And indeed, the products of art and science are different in form, content and functionality. It is only natural to conclude that art and science are, too, wildly different from each other.

The current way in which art and science are communicated makes asking "How?" and

receiving satisfactory answers arduous, which detracts most from further asking “Why?”. Being bound to asking “What?”, the public seems to have accepted a passive, consumer role in its relationship to art and science. Their fruits are either taken with no critical appraisal, or are ignored altogether. This might well be the most striking similarity between the two, albeit, not the only one. On a more fundamental level, both art and science are ways of exploring the world, rooted in our basic need for meaning and connection. This link between the two methods of exploration may not be obvious. However, when art and science meet, or, rather, when the conventional boundaries between them are blurred, it is difficult to ignore that both try to answer the same questions.

To our delight, there are more and more collaborative projects between artists and scientists who are open to blurring such boundaries and learning from each other. The Experiment series brought together a multidisciplinary team of researchers from the University of Groningen and the dance group Random Collision, who asked themselves in what way an audience is affected by what is happening on stage. Would different types of group solidarity in dance performance be reflected in an audience’s sense of connectedness? And crucially, is it possible for artists and scientists to open a dialogue, deconstruct expertise, and engage in a communal learning experience? Gloriously so.



If ‘The Experiment’ doesn’t prove that, the next project involving Random Collision shall.

Notes on Synchrony is a living laboratory of brain and movement research. It is based on the (to me, poetical) finding that the brain waves of two (or more) people synchronize when they are engaged in a range of activities like dancing, singing, or playing instruments together, but also cooperating on certain tasks or agreeing within a debate. A group of neuroscientists from the UG and a group of contemporary dancers set out to co-investigate the literal and metaphorical facets of this mental connection. In this exploration, science becomes oddly metaphorical, while art becomes loaded with scientific meaning. Imagine: dancers (wearing EEG caps) meet and part in a rhythmic drama of densely packed and deeply lived emotion, a poet writes and reads, a scientist observes and reports, a musician composes, a research assistant analyses incoming EEG

(electroencephalogram) data, two visions (Kirsten Krans, who created the space for this dialogue to occur, and Marieke van Vugt, who studies inter-brain coherence in her lab) skillfully move the cables from the EEG caps between the dancers, showing a comparable degree of synchrony, connection, and commitment, while, finally, the public, having been offered cards and pens, takes notes on synchrony.

The relevance of these projects extends beyond their artistic and scientific value. By creating a space where art and science can organically and synergistically meet, stripping away some of the prejudices built around the two methods of exploration, revealing that the “What?”, “How?”, and “Why?” of art and science can (and, sometimes, should) be the same. What’s more, the process of exploration and learning in which artists and scientists publicly engage has the potential of involving the audience in a more meaningful way than otherwise possible. The audience may ask “Why?” and “How?” and be part of the conversation. This democratization of expertise may be just what we need to break the post-truth curse.

■ BY VALERIA CERNEI
 ■ PHOTO OF VALERIA BY SANDER MARTENS

Originally published by [Mindwise](#)



Valeria is a student in the Behavioral and Cognitive Neurosciences research master programme. In exploring the human nature, she believes that only a multidisciplinary approach to humanity’s most ardent questions is likely to result in compelling answers. Thus, she tries to bring closer together various fields of inquiry – such as psychology, philosophy, art, and the natural sciences – by organizing public debates (the mindwise debates event series) and writing for the BCN Newsletter and Mindwise.

Translational neuroscience from single-cell biophysical models to movement disorders: the story of Richard van Wezel

Professor Richard van Wezel is a full professor in Visual Neuroscience, former Director of the Donders Centre for Neuroscience, the Vice-dean of Science in the Faculty of Science at Radboud University, as well as a full professor in Neurophysiology at the University of Twente. His current research interests include the processing of visual and spatial information and higher cognitive functions (attention, object recognition, memory), and neuroplasticity. Professor van Wezel has over 28 years of research experience in the field of perception, action, and control and was the 2019 BCN winter meeting keynote lecturer. Professor van Wezel discusses his past, present and future perspectives in the fields of visual neuroscience and neuropsychology in the following interview.

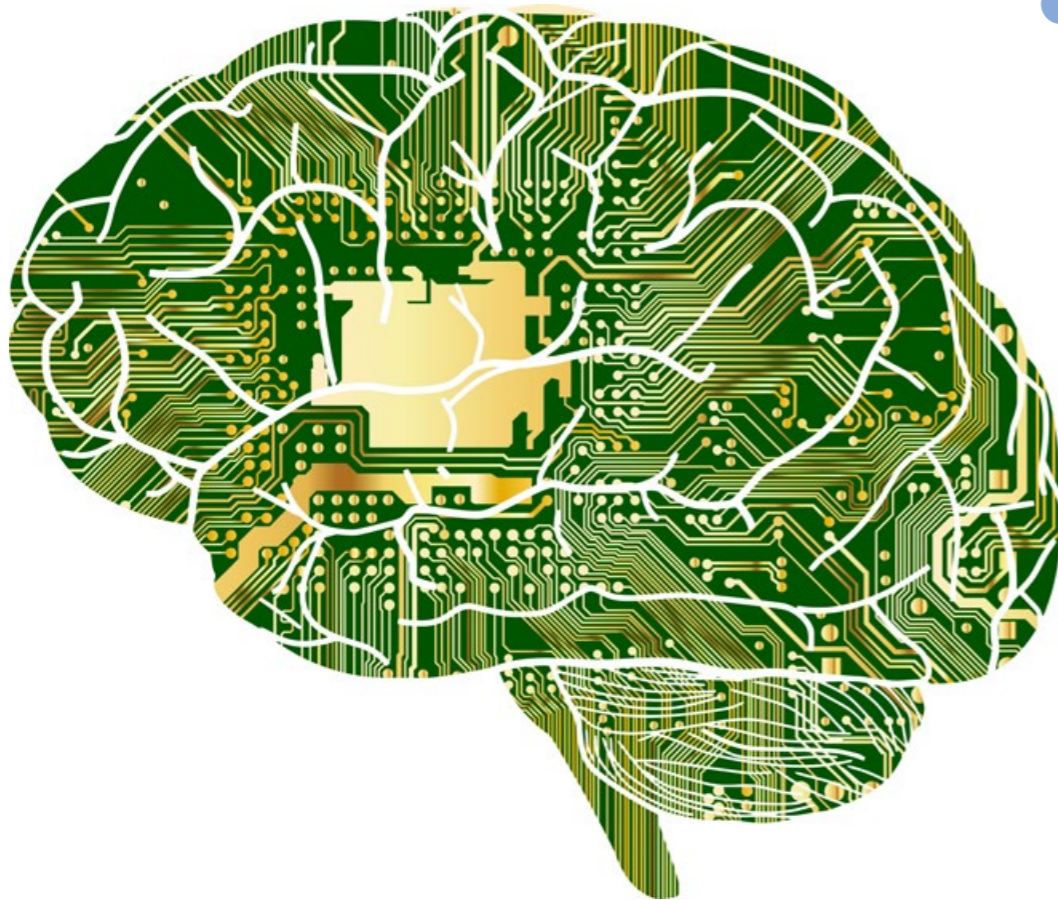
Why were you initially attracted to the field of neuroscience? How did your interest in visual motor processing emerge?

At Utrecht University I studied medical biology, there I was exposed to various disciplines, some were technically oriented (e.g. mathematics, physics, and informatics) while others were more experimental (e.g. in vivo recording horizontal cells in the retina of cats and molecular biology techniques). All these experiences have helped me throughout my academic career in understanding what other people are doing, which allows me to incorporate some of that information into my work. My advice to students, when they are choosing their internships is to choose different projects because the knowledge you acquire can be helpful later on your academic career, even if it turns out that you don't like a particular topic or field. I advise them to always try to approach things using

different angles and being exposed to various fields gives you these analytical skills. I encourage scientists at the start of their career to focus on one particular problem or niche but being exposed to different fields will ultimately benefit them in the long run.

> In order to really call something translational, you need the input from the patients who will ultimately benefit from your discoveries. <





Your earlier work focused on single-cell biophysical models and now you are working with human and animal psychophysics. With your research experience in mind, what does translational neuroscience mean to you?

My initial primary academic work focused on single-cell neurophysiology but I always worked in human and animal behavioural experiments on the side. Preclinical work allows researchers the opportunity to explore different approaches to a problem that otherwise would be extremely difficult to solve in patient populations. However, we need to be careful not to oversimplify models to single cells and even organs,

> One of the most rewarding aspects of doing clinical research is that you get to see how your work impacts the lives of patients. <

as this oversimplification might lead to confounding results. I think the best approach is to have research groups with different expertise, from biological and technical to clinical knowledge. In my opinion, in order to really call something translational, you need the input from the patients who will ultimately benefit from your discoveries.

Your recent work involves patients with movement disorders. How did you make the transition from working on single-cell and animal models to clinical research?

I have always been interested in experimental psychology projects and at an earlier age, also in human medicine. I guess now that I work with patients, I am able to explore that interest. Here at the University of Twente, my role as a professor has been very diverse, whereas my role as a professor first at Utrecht and later at Radboud University focused on visual neuroscience. I always look to form collaborations where the individual group members bring different skills (e.g. technical and clinical) in order to tackle problems from different angles. One of the most rewarding aspects of doing clinical research is that you get to see how your work impacts the lives of patients. I would encourage everyone to experience this, even if you do basic or fundamental science, experience the feeling of interacting with the population that will ultimately

benefit and you will get feedback from them to address the needs of this population.

What are your current collaborations with BCN and what opportunities do you see in the near future for collaborations?

BCN has a tradition of working with visual and cognitive neuroscience. I see many opportunities working in the field of vision and the visually impaired from ocular gene therapy to retinal implant prosthesis. These collaborations can be arranged between the clinical department of ophthalmology and researchers like Frans Cornelissen. Collaborations in the field of neurology involving Parkinson's patients could also be a possibility, especially with the University of Twente. The University of Twente has the opportunity to obtain research vouchers, where a group of people can get some money to start a project. The money is more of a symbolical gesture since what is more important is that people can sit together and share ideas and set things in motion. This could be a way to start a collaboration between the UMCG or RUG and the University of Twente. I think exposure to different projects and different academic environments can help to stimulate new ideas or collaborations.

■ BY JAIME MONDRAGON

Intro new staff writer



> ANNA NEUSTAETHER

I was a “why?” kid. I needed to know the reason for everything. Why is the sky blue? Why don’t birds get electrocuted when they sit on power lines? Why can’t I breathe underwater (after trying to more times than I’m willing to admit)? I firmly believe that insatiable curiosity and a need to experiment has led to me where I am today.

Animals are my first passion. I have always wanted to know more about them, and that led to my undergraduate degree in animal biology at the University of Guelph in Ontario, Canada. During my degree, I was drawn to genetics, especially the genetics of disease. Why do some animals get sick and others stay healthy? The topic of my MSc was a disease called spastic syndrome, which is much like Parkinson’s disease, but in cattle. I performed genetic analyses on this complex adult-onset disorder and discovered that it also had complex genetics, who would have thought? After this, I wanted to obtain my PhD in Europe, as it gave me a chance to explore more of the world. My research topics now include looking at a complex adult-onset disorder with complex genetics, except this time in humans.

I am very happy to be a part of this organization. The chance to contribute to the BCN newsletter places me a little outside of my comfort zone, but in a good way. I want to be able to communicate effectively to a wide audience in regards to science, and this is the perfect opportunity to do so. Additionally, I get to give back a little to the BCN!

■ PHOTO BY SANDER MARTENS

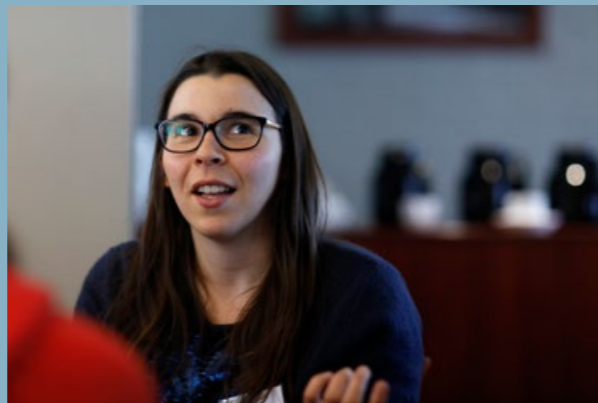


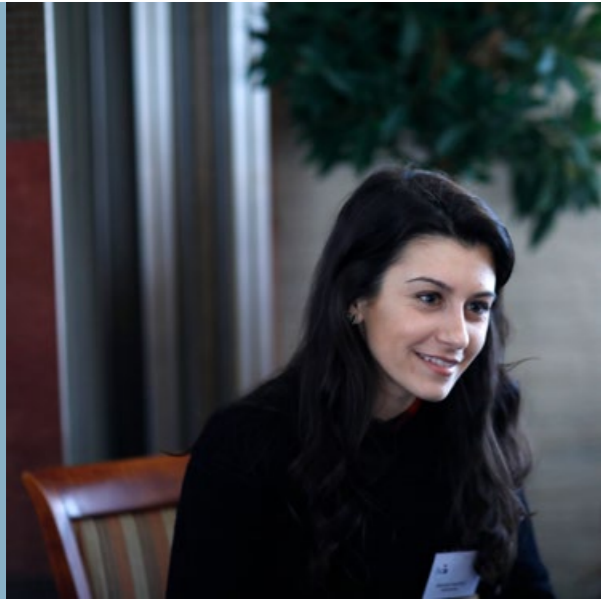
2019 BCN Retreat

The yearly BCN retreat in Odoorn allows PhD students to both partake in disseminating their research to peers, as well as to those who are not in their field. Specifically, at the “speed dating” event of this year’s retreat (21-22 March), students were encouraged to explain their research in a relatively short time frame, i.e., an elevator pitch. This not only helped in building communication skills, but it also provided an opportunity to create connections with researchers they may not have known of beforehand. In combination with the presentations, bowling, hiking, mountain biking, and good weather, it resulted in a lively and fun event.

■ BY ANNA NEUSTAETER
■ PHOTOS BY SANDER MARTENS







Dear fellow BCNers,

As your PhD council, we work hard to support your PhD project. Currently, we are very much involved in streamlining the METc submission process. We know that getting ethical permission from the METc is currently a problem to many of our PhDs. The process of writing and waiting for acceptance currently takes months, introducing significant delays in projects and a lot of frustration. A short while ago, we surveyed you to further investigate the problems and complaints with the METc. We are very happy to announce that the METc has indicated the will to change. We hope to give you more details on what has been accomplished in the next issue of the newsletter.

Alongside the METc, we are also still working on providing more options for your (mandatory) statistics training. BCN provides both a basic and a more advanced statistics course, but depending on your project, neither of these courses may specifically suit your needs. We have created a list of courses that you can follow as an alternative for the courses that BCN offers. After all, we want to learn the statistics that really help us in our own projects. If you are interested in the list, we advise you to contact us (email below) or Diana Koopmans (BCN coordinator). Currently, we are planning to investigate the options of setting up a course/workshop on Bayesian statistics.

We also promote educational events and organize social activities. We are always happy to hear from you about what kind of educational events or activities you would like to see in the future. Also, if you have suggestions for new activities, for speakers you want to attract (for e.g. seminars or master classes), or in case of general concerns about current policy, don't hesitate to send us an email: bcnphdcouncil@list.rug.nl.



Rodrigo Moraga Amaro
(chair)
Nuclear Medicine and
Molecular Imaging, UMCG



Nafiseh Ghazanfari
Nuclear Medicine and
Molecular Imaging, UMCG



Mila Roozen
GELIFES – Groningen Institute
for Evolutionary Life Sciences,
FSE



Sebastián Balart Sánchez
Neurology, UMCG



Stefan Huijser
Bernoulli Institute, FSE



Hermine Berberyan
Bernoulli Institute, FSE

> PHD AND OTHER NEWS

BCN Lectures and Master Classes

BCN would like to offer more BCN Lectures! If your department invites a speaker, or if you would like to invite a speaker, please inform the BCN Office. BCN is willing to support the lecture of your department financially, if the topic is interesting for other departments within BCN as well. In that case, the lecture will get the label BCN lecture, and will give you BCN EC's. BCN Office will also take care of the propagation of the lecture. An extra amount of money is available when the speaker is also willing to give a Master Class.

TSP

BCN PhD students with an appointment at the UMCG, are asked to fill out a Training and Supervision Plan (TSP), if they started their project on 1-1-2018 or later. Please upload the file to Hora Finita. You will find the form on the GSMS website: <https://www.rug.nl/research/gradschool-medical-sciences/phd-programme/tsp-training-and-supervision-plan/>

BCN Statistics Course

There are still places left in the BCN Statistics course that will start June 24. The themes of the 5 lectures are: Basic concepts of statistics, Introduction to R + data exploration, Various statistical tests (t-tests, ANOVA, non-parametric alternatives), Linear regression and logistic regression and finally Mixed-effects regression (multilevel modeling). It is also possible to choose another statistics course instead of the BCN Statistics course. Please contact me if you prefer that.

Instructors wanted

BCN is looking for new instructors for the BCN course Management Competence in your PhD project. Please contact me if you are interested! (d.h.koopmans@umcg.nl)

Winner BCN Best Presentation Award

During the BCN Retreat, participants voted for the best presentation. According to the audience, Marita Everhardt had the best presentation on the first day and Marjorie van Kooten had the best presentation on the second day! Congratulations ladies! Afterwards the

audience had to decide which of the two ladies had the best presentation overall. This resulted in Marita Everhardt winning the BCN Best Presentation Award!

Agenda BCN Activities

June 6, 20 and 27, 2019

BCN Management Competences, Part 1.
(Application: d.h.koopmans@umcg.nl)

June 24, and July 1-4, 2019

BCN Statistic Course

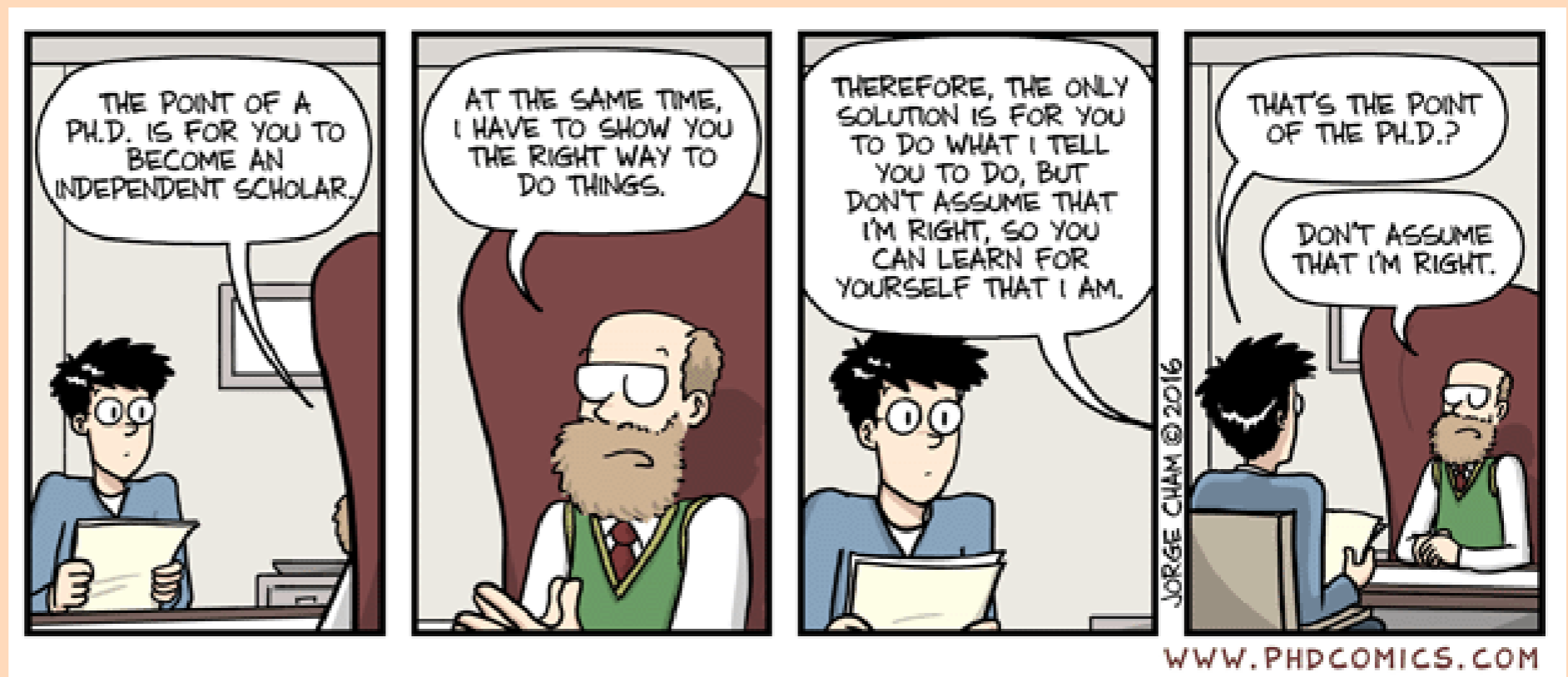
September 6, 2019

start BCN Orientation Course

Course application: <http://cursus.webhosting.rug.nl/gsms>

Please check the website for more detailed information.

■ BY DIANA KOOPMANS



> GRAND STUFF

The Global Young Academy

BCN member Martijn Wieling (Computational linguistics) has been selected as a member of the Global Young Academy (GYA): <https://globallyoungacademy.net/new-members-2019/>

The new members will join the GYA in late April 2019 for a tenure of five years.

The GYA is comprised of a group of outstanding young scientists from around the world, in the early stages of their independent academic careers. The GYA provides a rallying point for these individuals to come together to address topics of global importance. As of 2014, the GYA has reached its full capacity with 200 members. Members are selected for their scientific excellence and their commitment to service, and serve five-year terms. (source: <https://globallyoungacademy.net/gya-in-brief/>)

Marleen Janssen gives the deafblind a voice

Japan, Brazil, Austria, Australia, Germany, Georgia – these are all countries that Marleen Janssen has visited recently or will soon visit. As the only professor in the world who focuses on communication with deafblind people, she has no other option: her contacts live and work all over the world.

www.rug.nl/news/2019/02/marleen-janssen-gives-the-deafblind-a-voice



■ PHOTO BY ELMER SPAARGAREN

Faces of science

BCN PhD student Jidde Jacobi has been selected to become one of 66 Faces of Science, a new platform by the Royal Academy of Sciences (KNAW), the Young Academie (De Jonge Akademie), and NEMO Kennislink for young scientists to communicate with the general public about their research in the form of blogs and vlogs. Jacobi is a neurolinguist whose research focuses on speech problems in Parkinson patients.

https://www.rug.nl/let/organization/actueel/nieuwsberichten-2019/jidde-jacobi-geselecteerd-voor-_face-of-science_

<https://www.nemokennislink.nl/pagina/over-faces-of-science/>



■ PHOTO BY RUG

Young Academy Groningen (YAG)

Sahar El Aidy (Faculty of Science & Engineering) is one of the new members of the Young Academy Groningen. She hopes to be an example for students from minority cultures and wants to bridge the gap between fundamental and applied research, as well as put gut bacteria on the map.

<https://www.rug.nl/news/2019/03/0326-elaidy>

Ubbo Emmius Junior Scientific Masterclass Talent Grant

Nick Schubert is one of the talented JSM MD/PhD students of the UMCG who won a UEF-JSM Talent Grant of 6.000 euros.



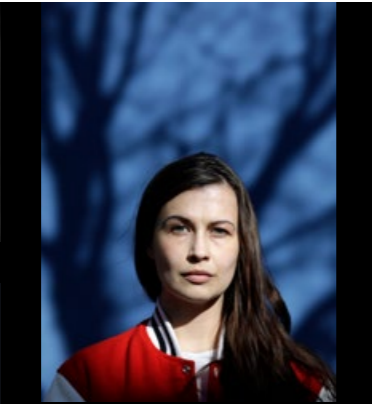
■ PHOTO BY UMCG

Cool links

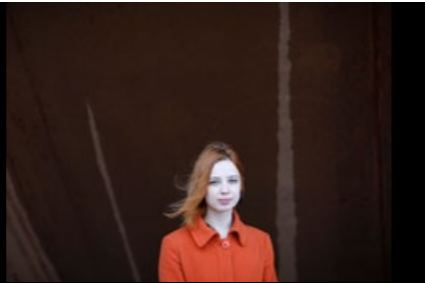
- > The 2018 top 10 finalists for illusion of the year
<http://illusionoftheyear.com/cat/top-10-finalists/2018/>
- > After its discovery 170 years ago, scientists may have discovered how general anaesthesia actually works
<https://www.sciencedaily.com/releases/2019/04/190418135041.htm>
- > Researchers at Yale university were able to restore circulation and cellular activity within the brain of a pig, four hours after it's death
<https://www.sciencedaily.com/releases/2019/04/190417132805.htm>
- > The effect of electric currents in brains with migraine
<https://www.sciencedaily.com/releases/2018/06/180627160334.htm>
- > A 204 mega pixel image, taken over 1,060 hours of a neighbour to the Milky Way galaxy
<https://astro-space-page.blogspot.com/2019/04/1060-hours-image-of-the-large-magellanic-cloud-chile.html>



Anna Leonte



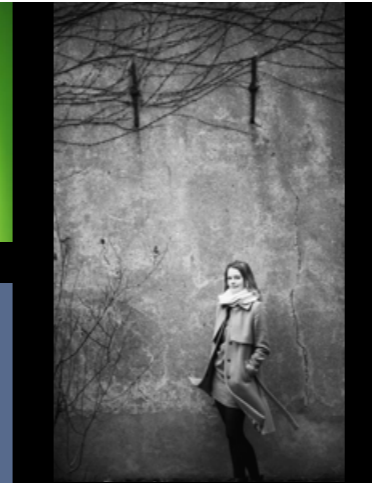
Anna Neustaether



Valeria Cernei



Michiel Hooiveld



Nena Lejko



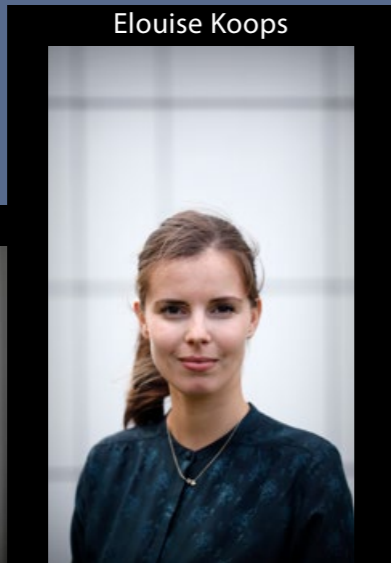
Evelyn Kuiper-Drenth



Sander Martens

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 or PhD student, 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, sander.martens@gmail.com!



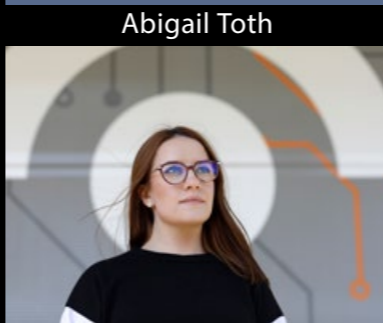
Elouise Koops



Jaime Mondragon



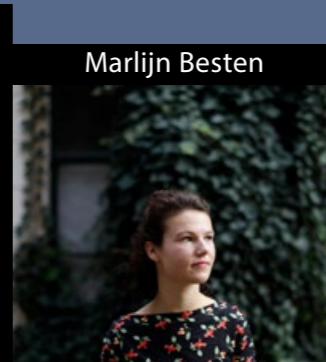
Floor Arts



Abigail Toth



Sebastian Balart-Sanchez



Marlijn Besten



Namrata Rao

> PROMOTIONS

Aging in multilingual Netherlands: Effects on cognition, wellbeing and health

PHD STUDENT

A. Pot

THESIS

Aging in multilingual Netherlands: Effects on cognition, wellbeing and health

PROMOTORS

Prof.dr. C.L.J. de Bot

Prof.dr. M.C.J. Keijzer

FACULTY

Arts

Aging in a multilingual environment can positively contribute to cognition, but it also has consequences for the wellbeing of older adults who age in an environment where the dominant language differs from their mother tongue. This dissertation reports on a large study towards the individual effects of multilingualism on executive functions. The second half of the dissertation reports on a qualitative study towards a potential language barrier for older Turkish women who age in the Netherlands.

The continuous suppression of a language in the multilingual mind is assumed to train the brain. However, it seems difficult to ascribe cognitive consequences directly to multilingualism, especially when comparing groups of mono- and multilinguals, thereby ignoring individual variability within the groups. This dissertation therefore posits to consider under which



■ PHOTO BY TRACI WHITE

circumstances multilingualism contributes to cognitive performance within a diverse multilingual population. A high degree of quality of life, certain personality characteristics and the opportunity to use the different languages in various social environments leads to enhanced performance on a cognitive attention-task.

In interviews with older Turkish women it is observed that a low command of the second language (L2, Dutch) may lead to language anxiety. This has repercussions for the formation of L2 social relations, feelings of belonging and low levels of wellbeing. Being well-embedded in a social network (L1 or L2), however, can lower language anxiety. A language barrier and lower levels of wellbeing are therefore only reported for those adults who are linguistically

dependent but do not have a social (support) network.

Anna Pot (1991) was promoted on January 31, 2019.

A move ahead: Research into the physical activity support of people with (severe or profound) intellectual disabilities

PHD STUDENT

L.W.M. Bossink

THESIS

A move ahead: Research into the physical activity support of people with (severe or profound) intellectual disabilities

PROMOTORS

Prof.dr. A.A.J. van der Putten

Prof.dr. C. Vlaskamp

FACULTY

Behavioural and Social Sciences

Het onderzoek dat in dit proefschrift wordt beschreven richt zich op de bewegingsgerichte ondersteuning van personen met een verstandelijke beperking, met specifieke aandacht voor personen met een (zeer) ernstige verstandelijke en meervoudige beperking (EMB). In dit proefschrift wordt ingegaan op de volgende kennislacunes:

(1) De mate en wijze van motorische activering in de huidige ondersteuning bij personen met EMB: Hoewel motorische gedrag alles omvat

wat we doen, tonen de resultaten van dit proefschrift aan dat motorische activering van personen met EMB gering én geen structureel onderdeel is van de huidige ondersteuning. (2) De rol en het gedrag van zorgprofessionals bij personen met een verstandelijke beperking en EMB in het bijzonder: Bekend is dat omgevingsfactoren een belangrijke rol spelen in de bewegingsgerichte ondersteuning van personen met een verstandelijke beperking in het algemeen, maar zeker ook bij de groep EMB. Een centraal onderdeel van deze omgeving kan worden toegeschreven aan de kwaliteit en het gedrag van de door zorgprofessionals geboden ondersteuning. De resultaten van dit proefschrift vormen een eerste aanzet tot het beter begrijpen van de rol en het gedrag van deze zorgprofessionals wanneer het gaat om het uitvoeren van een bewegingsgerichte ondersteuning. Een aantal zorgprofessionals geven bijvoorbeeld aan wel te weten dat bewegen belangrijk is, maar dat zij het vaak erg lastig vinden om het daadwerkelijk te integreren in de ondersteuning. Op basis van de resultaten zou het met name interessant zijn om toekomstig onderzoek te richten op het ontwerpen van een intern trainingsprogramma waarin ook strategieën voor het veranderen van de fysieke en sociale omgeving binnen de organisatorische context worden meegenomen. (3) De effectiviteit van een interventie waarbij 'beweegbanken' worden ingezet bij personen met EMB: Dit onderdeel van het proefschrift anticipeert op een trend in de praktijk gericht op de ontwikkeling van diverse beweeginitiatieven

>> CONTINUATION PROMOTIONS



■ PHOTO BY LAURA DE VRIES

voor personen met EMB. Beweebanken zijn banken die door middel van een elektromotor worden aangedreven. Een bepaald gedeelte van deze bank beweegt waardoor de persoon, die op de bank ligt, geassisteerd bewogen wordt. De resultaten laten zien dat de interventie uitvoerbaar is voor personen met EMB, maar dat er geen effecten op de verwachte uitkomstmaten worden gevonden. De studie bevestigt de noodzaak om praktijkinitiatieven wetenschappelijk te (laten) onderbouwen. Alleen dan kan van zorgprofessionals worden verwacht dat zij een interventie op een individuele, gerichte en betekenisvolle manier inzetten bij een persoon met EMB.

Leontien Bossink (1989) was promoted cum laude on March 31, 2019.

The role of visual adaptation in cichlid fish speciation

P H D S T U D E N T

D.S. Wright

T H E S I S

The role of visual adaptation in cichlid fish speciation

P R O M O T O R S

Prof.dr. M.E. Maan

Prof.dr. A.G.G. Groothuis

C O P R O M O T O R

Prof.dr. S.C.D. van IJendoorn

F A C U L T Y

Science and Engineering

Aquatic environments are well-suited for studying visual adaptation. Light attenuation

creates distinct photic environments, to which vision-dependent species must adapt. In Lake Victoria, *Pundamilia* cichlids with blue vs. red male coloration co-occur at many locations. The species are depth-segregated, occupying different visual habitats, have different colour vision properties, and females exert species-specific mate preferences for male colour. Correspondence between these factors implicates divergent sensory drive as the mechanism of speciation. Here, we experimentally test this hypothesis, by examining the link between vision and

■ PHOTO BY WHITNEY WRIGHT



behaviour. We manipulated visual system development by rearing fish in environments that mimic the light conditions of Lake Victoria and then tested for variation in behaviour and visual system properties. Light treatments influenced female preference for blue vs. red males, while male coloration did not change. Light treatments also influenced the expression of colour sensitive pigments in the eye, but we could not establish a causal link between pigment expression and preference. Possibly, visual pigment genotype is more important for female preference. This is in line with the results of foraging tests, in which fish performed better when tested in light conditions natural to each species. Finally, field surveys revealed geographic variation in pigment expression across populations, that did not align with species differences in visual pigment genotype and female preference. We concluded that visual perception influences cichlid behaviour, but that different components of the visual system, i.e. pigment gene sequence and expression, may play different roles in *Pundamilia* adaptation and speciation.

Shane Wright (1985) was promoted on March 29, 2019.

>> CONTINUATION PROMOTIONS

Off-label use of antipsychotic medication in people with intellectual disabilities: Adherence to guidelines, long-term effectiveness, and effects on quality of life

P H D S T U D E N T

L. Ramerman

T H E S I S

Off-label use of antipsychotic medication in people with intellectual disabilities: Adherence to guidelines, long-term effectiveness, and effects on quality of life

P R O M O T O R

Prof.dr. P.J. Hoekstra

C O P R O M O T O R

Dr. G.M. de Kuijper

F A C U L T Y

Medical Sciences

People with intellectual disabilities often use antipsychotic drugs long-term to reduce challenging behaviours. This thesis discusses the prescription practice, the relationship between long-term use of antipsychotics and quality of life, and the effects of discontinuation of risperidone.

A survey of medical records showed insufficient adherence to guideline recommendations. Only a minority of the surveyed clients received, in addition to an antipsychotic, a psychological treatment. The annual monitoring of side-effects is infrequent and does not take place for all clients, while only half of the clients attempted to discontinue the medication. Physicians and psychologists suggested



■ PHOTO BY ROBBIN GERRITS

that guideline recommendations should be further incorporated into organization-specific treatment policies of organizations to improve adherence.

When people with intellectual disabilities use antipsychotics long-term, their quality of life is often lowered. Also, their mental well-being is often reduced, which is linked to the presence of challenging behaviours. Side-effects, such as parkinsonism and lowered bladder control, can affect physical well-being. Discontinuation of antipsychotics has a positive effect on physical well-being and only resulted in a temporary lowering of mental well-being.

A placebo-controlled discontinuation study showed that withdrawal from risperidone is often possible without a worsening in challenging behaviours, except for a possible increase in stereotypical behaviour. The withdrawal of risperidone has a positive effect on physical health, due to a decrease in weight, waist circumference and an improvement of certain blood levels (prolactin and testosterone). Reducing antipsychotic drug use by people with intellectual disabilities is an important recommendation for clinical practice.

Lotte Ramerman (1987) studied Human Movement Sciences at the University of

Groningen and Management, Policy-analysis and Entrepreneurship in the Health and Life Sciences at the University of Amsterdam (VU). She did her research at the Centrum Verstandelijke Beperking en Psychiatrie of GGZ Drenthe and the department (Child- and adolescent) Psychiatry of the University Medical Center Groningen. She now works as researcher at the Nivel. She was promoted on April 15, 2019.

Anterior segment optical coherence tomography angiography: Development and application of OCT angiography for corneal vascularisation

P H D S T U D E N T

M. Ang Han Nian

T H E S I S

Anterior segment optical coherence tomography angiography: Development and application of OCT angiography for corneal vascularization

P R O M O T O R S

Prof.dr. N.M. Jansonius

Prof.dr. L. Schmetterer

Prof.dr. J. Metha

F A C U L T Y

Medical Sciences

Corneal diseases are among the most common causes of blindness in the world. Vascularization of the cornea is a common and potentially vision-threatening problem; the healthy cornea has no vessels and vascularization is the result of every inflammatory process

>> CONTINUATION PROMOTIONS

in which the cornea is involved. The current gold standard for imaging vascularization is invasive; it requires injection of an intravenous contrast fluid (indocyanine green, ICG). OCT angiography (OCTA) is a new, non-invasive imaging technique that has been developed to visualize the vessels of the retina. However, the current OCTA systems are not optimized for the cornea. The main goals of my PhD thesis are (1) to establish that OCTA systems designed for the retina (posterior segment of the eye) can also be used to image the cornea (anterior segment of the eye), (2) to design a method to analyze and quantify OCTA images of the cornea and (3) to compare OCTA with the current gold standard, ICG angiography (ICGA), histology, and confocal microscopy. The research described in this thesis opens the possibility for a new, non-invasive and rapid imaging technique to evaluate the cornea and corneal vessels simultaneously. The results support that this new technique is capable of evaluating corneal vessels in a fast, safe, and reliable manner, with a good correlation with other clinical tools used in our practice, and with a possibility to observe changes over time. The same technique could also be used in a broader range of clinical applications in ophthalmology such as glaucoma.

Marcus Ang Han Nian (1980) studied Ophthalmology at the National University of Singapore. After that he worked as Consultant Ophthalmologist in Singapore Nationale Eye Center. His doctoral research took place in the Moorfields Eye Hospital (London) and the Singapore Eye Research Institute (Singapore) from 2014 till 2018. He was promoted on April 17, 2019.

Rhythm & Blues: Chronobiology in the pathophysiology and treatment of mood disorders

P H D S T U D E N T

S.E. Knapen

T H E S I S

Rhythm & Blues: Chronobiology in the pathophysiology and treatment of mood disorders

P R O M O T O R

Prof.dr. R.A. Schoevers

C O P R O M O T O R

Dr. R.F. Riemersma-van der Lek

F A C U L T Y

Medical Sciences

In this thesis chronobiological mechanisms in mood disorders are studied in three different parts. First, the vulnerability to develop mood disorders is studied by looking at chronotype (being a morning or evening person), genes and mood disorders. There were a number of genes related to mood disorders and to chronotype, but there was no mediating effect. Furthermore, we showed that patients with depressive disorder did not have more social jetlag (the mismatch between internal clock and external rhythm). The second part studied the direct relationship in rest-activity rhythms and bipolar disorder. We found patients with bipolar disorder are able to maintain a normal rest-activity rhythm outside a mood episode. Furthermore, we showed that sleep disturbances might function as a warning sign for an imminent mood episode. In a detailed study, we found that especially in a manic episode, sleep disturbances precede the mood



■ PHOTO BY JENNE HOEKSTRA

episode. Lastly, we studied a novel biomarker in activity patterns, which might be able to help diagnose bipolar disorder. In the third part, we showed that patients with seasonal affective disorder can be successfully treated with light therapy in the morning. Only one week of light therapy might be enough and there is no need for individual timing of the light depending on what chronotype the patient is.

Stefan Knapen (1990) studied Medicine at the University of Groningen (RUG). After that he worked as physician's assistant at the Reinier de Graaf Gasthuis. His doctoral research took place with prof. dr. Robert Schoevers and dr. Rixt Riemersma-van der Lek at the University of Groningen. He was promoted on April 17, 2019.

Multimedia-minded: Media multitasking, cognition, and behavior

P H D S T U D E N T

W. Wiradhany

T H E S I S

Multimedia-minded: Media multitasking, cognition, and behavior

P R O M O T O R

Prof.dr. R. de Jong

C O P R O M O T O R

Dr. M.R. Nieuwenstein

F A C U L T Y

Behavioural and Social Sciences

In our current media-saturated environment, our ability to interleave between one stream of information and another, or media multitasking, is highly valuable. At the same time, however,

>> CONTINUATION PROMOTIONS



■ PHOTO BY FLORIAN SENSE

studies have suggested that media multitasking may lead people to become more vulnerable toward distraction. This thesis presents a collection of studies which aimed to answer three questions: What constitutes the media multitasking behavior? is media multitasking associated with increased distractibility? and to what extent does the presence of media devices influence our ability to process information? Respectively, we found that media multitasking behavior revolves around a small set of prominent media combinations involving Texting, Browsing, Listening to music, and Accessing social media. We found no association between media multitasking and distractibility, as measured in task performance, yet we did find weak associations between media multitasking and self-report measures of distractibility. Lastly, we found a small reduction in task performance under the presence of

media devices, in particular the participant's own mobile phone, even when there was no interaction with this device. These findings are discussed in light of the paradoxical nature of media multitasking: People are likely to be aware of the costs of media multitasking, but they may continue to do so to maintain a balance between exploitation (i.e., ensuring optimal task performance) and exploration (i.e., switching from one task to another) behaviors. Accordingly, given the limited evidence on the association between media multitasking and increased distractibility and considering the paradoxical nature of the behavior, future studies might be interested to evaluate the benefits of media multitasking in addition to its potential costs.

Wisnu Wiradhany (1987) was promoted on April 18, 2019.

Parkinson's disease and impairments in executive functions:

assessment and treatment from a neuropsychological perspective

PHD STUDENT

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THESIS

Parkinson's disease and impairments in executive functions: assessment and treatment from a neuropsychological perspective

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De ziekte van Parkinson (ZvP) is een neurodegeneratieve ziekte, die gepaard gaat met zowel motorische als niet-motorische symptomen, zoals cognitieve stoornissen. Stoornissen in executieve functies (EF) komen frequent voor bij patiënten met de ZvP. EF zijn essentieel om doelgericht gedrag te vertonen. Stoornissen leiden tot een afname van het zelfstandig functioneren en van ervaren kwaliteit van leven. In het proefschrift van Thialda Vlagsma werd middels neuropsychologisch onderzoek onderzocht hoe stoornissen in EF zich kenmerken bij de ZvP. In een RCT werd onderzocht of cognitieve behandeling (strategie- versus functietraining) deze stoornissen kan verbeteren in het dagelijks leven.

Patiënten met de ZvP lieten een vergelijkbaar profiel van stoornissen zien op

neuropsychologische tests voor cognitieve flexibiliteit, inhibitie en planning (aspecten van EF) als patiënten met niet-aangeboren hersenletsel (NAH), voor wie cognitieve behandeling gericht op stoornissen in EF een standaard behandeloptie is. Beide groepen stelden vergelijkbare hulpvragen en doelen op voor cognitieve behandeling. Zowel neuropsychologische tests als vragenlijsten bleken van toegevoegde waarde te zijn om EF problemen bij patiënten met de ZvP in kaart te brengen. Mentale traagheid heeft geen negatieve invloed op neuropsychologische testresultaten, maar bij het interpreteren van specifieke aandachttests moet motorische traagheid wel in beschouwing worden genomen.

Zowel strategietraining (ReSET) als functietraining (Cogniplus) leidden bij patiënten tot enige subjectief ervaren verbetering van executief functioneren in het dagelijks leven. Beide behandelingen hadden echter geen effect op het algemene niveau van participatie en de kwaliteit van leven. Er kan niet gesteld worden dat strategietraining de voorkeur heeft boven functietraining.

Thialda Hoogstins-Vlagsma (1987) was promoted on April 25, 2019.

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



> CHEEKY PROPOSITIONS

“Het echte voordeel van meertaligheid is mensen stiekem te kunnen verstaan, en onverstaaanbaar te zijn wanneer het uitkomt.” [The real advantage of multilingualism is being able to secretly understand people and being unintelligible when convenient.]

> Anna Pot

“It must be borne in mind that the tragedy of life doesn't lie in not reaching your goal. The tragedy lies in having no goal to reach. – Benjamin Mays”.

> Shane Wright

“Sample size is ook niet alles...” [Sample size is not everything]

> Lotte Ramerman

“Maandag is, ondanks de sociale jetlag, de mooiste dag van de week.” [Monday is, despite the social jetlag, the most beautiful day of the week.]

> Stefan Knapen

“Get rhythm, when you get the blues. – Johnny Cash.”

> Stefan Knapen

“Er bestaat een positieve correlatie tussen de aandacht die is besteed aan de inrichting van een restaurant, de kennis van de ober en de kwaliteit van het eten.” [There is a positive correlation between the attention paid to the design of a restaurant, the knowledge of the waiter and the quality of the food.]

> Thialda Hoogstins-Vlagsma

> COLOPHON

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