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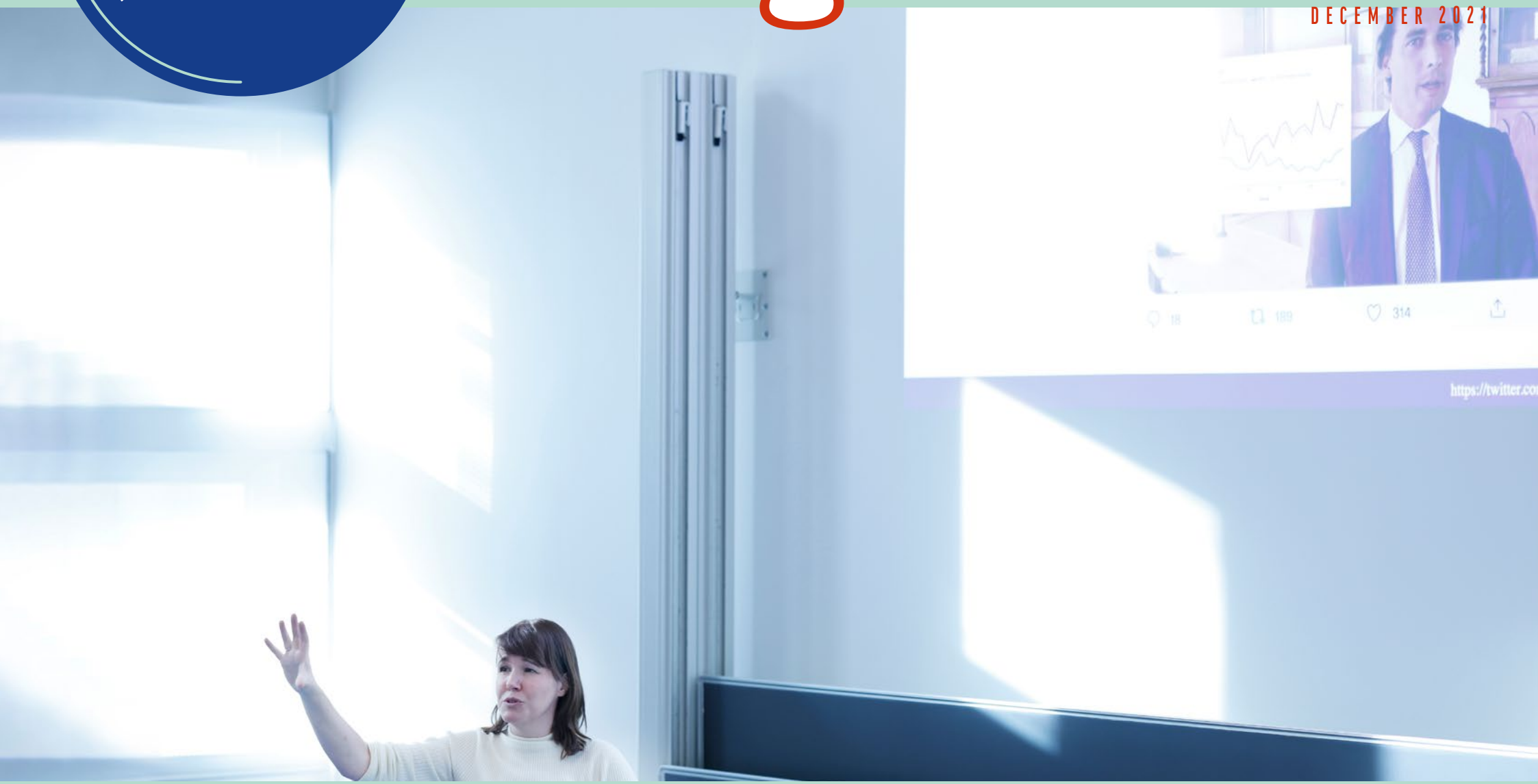

Nothing but the truth

university of groningen

What's in a name?



Next year I will have been editor-in-chief for no less than ten years...! The Newsletter itself has been around for much longer, though. Whereas BCN was born in November 1987, the very first 'BCN Nieuwsbrief' was sent around in September 1992. I couldn't quite discover when exactly it switched from Dutch to English and henceforth was named 'BCN Newsletter', but it's clearly been around for quite some time.

Over the years, however, we increasingly heard people say that the Newsletter looked and read much like a glossy magazine and that its title didn't quite do it justice. If it looks like a duck, swims like a duck, and quacks like a duck, then it probably is a duck. Indeed, who are we to argue with that?

"OK, well, what took you so long?!", I hear you say... Let me explain with a little bit of history. BCN has always had many different faces due to its multidisciplinary nature. Fortunately, the newsletter formed a great medium to visualize the many things that went on inside BCN's virtual walls, thus playing an important role in the visual branding of BCN. In fact, after all these years we considered the Newsletter itself as a strong brand that should be treasured as such.













Admittingly though, the only constant in life is change. And indeed, also the Newsletter has changed quite a bit. Whereas it was originally distributed on paper for more than two decades, not only did it change into a more economic and durable pdf format, it subsequently also saw a steady rise in page count, photography, and hopefully in overall quality. It's indeed only because of the Newsletter's long history that BCN has been holding on to its name for all these years. If Facebook can change its name to Meta, so can we! And for the somewhat older reader: if Raider can change its name to Twix, so can we!

In these winds of change we felt tempted to organize wild brainstorm sessions or even a grand national contest to come up with an exciting new name. However, in all her wisdom and in true down-to-earth Groninger style, the BCN board decisively renamed the BCN Newsletter to: BCN magazine!

Albeit not a spectacular new name, the change is definitely welcome and appropriate, and we are very happy with the fresh new look in true magazine style! Whatever further changes the magazine will go through in the next 34 years, we hope you will continue to enjoy reading it as much as we continue to enjoy making it!

BY SANDER MARTENS
EDITOR-IN-CHIEF



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ENLIGHT

The dream of a European university
An interview with Elmer Sterken



ENLIGHT is a network of nine European universities that strives to encourage movement and knowledge exchange between its members, with the ultimate goal to become one European university where students and staff can take advantage of common resources across multiple institutions.

The current members of ENLIGHT are the University of Basque Country (Spain), University of Bordeaux (France), Comenius University Bratislava (Slovakia), National University Ireland Galway (Ireland), Ghent University (Belgium), University of Göttingen (Germany), University of Tartu (Estonia), Uppsala University (Sweden) and the University of Groningen.

We talked to Elmer Sterken – the academic leader of the ENLIGHT consortium – who explained to us the mission of ENLIGHT, his personal connection to it and its future plans. Next to his role in ENLIGHT, he is also a Professor of Monetary Economics at the Faculty of Economics and Business. Elmer was on the board of the University from 2011-2019 where he especially focused on internationalization.

"Can you describe the mission of ENLIGHT in your own words?"

In the long-term ENLIGHT has the goal of becoming a European university – an idea that dates back to a speech by the French President Macron in 2017 where he wanted to revive the idea of academic unification across Europe. A European university is a network of universities within Europe where students can freely move between universities to have access to a wider number of educational and also cultural experiences.

Together with the ENLIGHT consortium we want to build a connection between its member universities, not only on a faculty level – which already exists for example with the Erasmus+ program – but on a whole university level. Thus, we want students to be able to freely move but we

also want to encourage collaboration between faculty members. By working closely together and providing an environment that makes collaboration easy, we hope to establish trust and build relationships between students and academics across the different institutions.

"Do you feel a personal connection to this project?"
Yes. I very much identify with the goals of ENLIGHT also on a personal level. The way that I see internationalization, you can divide it into three steps. Firstly – and this is what the UG already did – you can try to attract foreign students to attend the university. Secondly, once the students are here, you have to adjust the university and programs to the foreign students coming in. This means to be aware of diversity in the student population and to actively provide opportunities for students to showcase this diversity in class. Lastly, you should also think about students who come to Groningen but want a foreign experience. This could for example be a student from the province that decides to attend our university but halfway through his degree programs is interested in foreign experiences. The ENLIGHT consortium can be a tool for this, by providing easily accessible exchange opportunities.

"Does ENLIGHT have goals that go beyond education?"
Yes, we have five flagship areas within ENLIGHT, which are Health and Well-being, Digital Revolution and Impact of Digitalization, Climate Change, Energy and Circular economy and Equity. We want to connect these topics to challenges in the local environment of the universities. To give an example, Groningen is in the healthy aging region which includes the north of the Netherlands and Germany. As ENLIGHT, we want to actively involve our students in this local role and into these local challenges. So, if students will do projects, we want to encourage them to contribute to solutions for local challenges by focusing their projects on real life projects within the region of the university they attend.

"Does ENLIGHT also have goals to support research collaborations at its member universities?"
Yes, indeed. Apart from the ENLIGHT application, we also had an application for ENLIGHT RISE approved, which focuses on research. For now, this is a small grant but we want to use this to set up a database and infrastructure that makes it easier for researchers of our member universities to find and contact each other. However, this is just a beginning. In the future, we hope to provide more opportunities – especially for master and PhD students. So, we want to provide opportunities for research collaborations where master students can go to do projects abroad at partner universities. Furthermore, we also plan to apply for funding for double PhD degrees projects that link to local challenges at various partner universities. Within research we see a tendency for increased specialization of individuals; however, the global challenges we face nowadays are often very broad. While this requires detailed understanding of the sub-processes, a broader view is equally important, and this can often be achieved by collaboration with other researchers. Therefore, in the future, we hope to especially support these interdisciplinary collaborations on societal challenges that fall within the ENLIGHT flagship areas.

"How can people get involved with ENLIGHT?"
The more people feel affiliated to this initiative and the idea that ENLIGHT represents, the happier we are. Right now, researchers and students that want to contribute to the movement is really what we need. We have some funding from the European commission, but that is surely not enough. Based on our own estimate, the money we received covers around 25% of the total cost of the project, so any help outside of that will go a long way. As of now, there are not many formal ways to collaborate with ENLIGHT but if you are a researcher or student, who is interested in the concept or could benefit from collaboration between these institutions, please feel free to contact us to explore possibilities of how we can help each other. Essentially, at this moment, any interest in ENLIGHT is helpful.

ENLIGHT has only been around for one year, so a lot of opportunities are still to be developed. In the near future, summer schools and courses for master students will be added to the curriculum.

If you want to learn more about ENLIGHT and stay up-to-date with new developments, you can check out their website: https://enlight-eu.org/
If you want to get involved, have ideas for collaborations that fit within ENLIGHT or have questions, contact Elmer Sterken: e.sterken@rug.nl

- **BY SOPHIA WILHELM**
- **PHOTO BY GERHARD TAATGEN**

BITS AND PIECES COLUMN

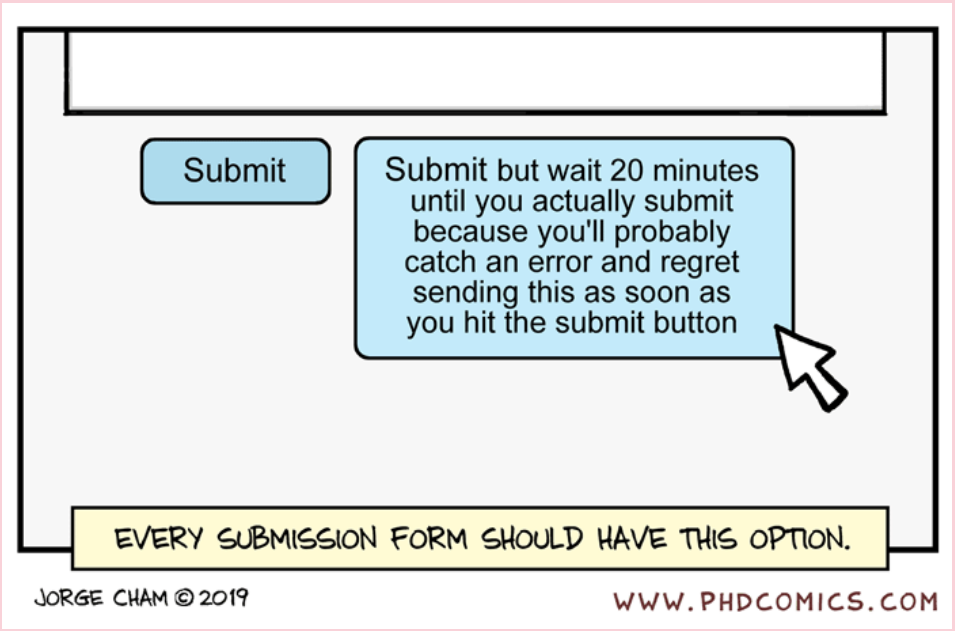
Prediction error

I could already sense the overwhelming feeling of relaxation. The satisfaction and blissful delight of all the good things that life can bring. I could envision myself sitting on my couch, just enjoying a nice Netflix series. Appreciating dinner with friends. Laughing. Sleeping like a baby. All I had to do was to submit my grant application. The only thing that stood between my current super stressed me and this state of indulgence was hitting the submit button.

I thought I was wrong. Again. I was wrong when submitting my MSc-thesis. When handing in my PhD-thesis. I was wrong when submitting numerous failed and some successful grant applications. Nothing is more stressful than hitting "submit". Nothing starts perseverative thinking and nocturnal startling responses better than sending something away without the possibility for further tweaking. Nothing gives less immediate satisfaction than finishing something that you have been focusing on for quite a while.

I expected relaxation, but experienced stress and exhaustion. It's actually pure prediction error, the psychological phenomenon describing the mismatch that occurs when what actually happens differs from what you expected. it's a process that is crucial for learning. That is, under normal circumstances, you tend to adjust your expectations based on what you experience. For example, you expect food to be super nice, you taste it, but hate it and spit it out, and next time you will not touch it. You've learned. You're a smart person after all, an evolved species.

Unfortunately, it doesn't quite work like that with submitting something. I don't seem to learn anything. It's probably something that is needed for human survival. Like mothers that give birth, and who after a while only remember the happiness they felt when holding their baby for the first time and forget the unaesthetic stitching that happened at that very moment (Sorry for this, but nothing but the truth ;-)).



It is exactly like that right after submission has taken place. It hurts. But you forget. And that's a good thing. Otherwise no one would ever have more than one child. And no one would think about starting a PhD, let alone submitting a grant to advance our knowledge. 'Scientists' would become an extinct species. Civilization as we know it would cease to exist. I think it's a system bug, albeit a clever one. We don't learn. So we can learn. Smart hey? [A picture of Joey from Friends would be great here]

● BY MARIE-JOSÉ VAN TOL

From the board room

I am writing this at the moment the government has implemented new and more strict rules to reduce personal contact in order to fight the increased number of covid cases in our country. As recent research also indicated, our bachelor, master and PhD students suffer the most from this covid situation within our academic bubble.

These tightening measurements are partly due to the fact that many people no longer adhere sufficiently strict to the behavioural rules imposed by the government, while the government itself has difficulties to decide on a long-term view on the matter. This indicates that fighting a pandemic is an interdisciplinary enterprise, encompassing not only virology, but also the behavioural and cognitive neurosciences. The lack of knowledge, which makes predictive models for how the pandemic will develop so unreliable, demonstrates the importance of a proper balance between applied and fundamental research (which can easily be said about climate change issues as well) and will hopefully lead to substantial investments in research under the new government. The plans for several disciplines, including biology, indicate that substantial investment is needed given the current societal problems (including brain and behavioural pathologies) and the high student – staff ratio. There is some optimism that additional substantial funding may be decided on by the next government.
Nevertheless, for the results of scientific work to be effectively implemented, it should be reliable and meet sufficient trust of policy makers and the general public. As this has become increasingly problematic, the BCN board took the initiative to organize, together with an organizing committee and our office collaborators, a conference with exactly this topic: “Nothing but the Truth”. This took place on November 1st. Several plenary speakers discussed various aspects related to the topic of Trust and Truth in Science: from the development for new criteria to evaluate the quality of researchers (less on quantitative and individual performance, such as number of publications with being first or last author, to more quality and team work aspects), to truth as indicated by hypothesis testing via statistical and philosophical approaches, to meta-analysis of research results showing aspects of severe inconsistencies in design, results and interpretation, as well as biases in publication output, to social and ethical consideration in how science should pursue the truth. In addition, no less than twelve work-shops were organized on a high diversity of topics related to the conference, from the role of journals, to data presentation and statistics, to how to raise the right questions, to open science and outreach. Our optimism turned out to be justified: the largest room at the Zernike Campus was almost completely full and all workshops were sold out long before the event took place. We plan to organize this on an even larger scale (several days at the national level) in the coming year, depending on the covid situation.

All attendants from the past conference have received a request for feedback and I would like to encourage everyone to let us know their thoughts about possible improvements and a new program.
Another topic that has received full attention of the board over the last months is the formal re-accreditation of BCN as a research school, which normally needs to take place every six years or so. For this a self-evaluation report is needed, where we describe our vision, mission, organizational structure, our activities and, especially important, our plans for the future: what went well, what not, what should change, what we need. For this we received professional help from the university, as well as advice from, among others, our Think-Tank and Educational Committee. The board decided not to go ahead with defining a limited number of research foci, as this has not worked well in the past and leaves a substantial part of our community as bystanders. Instead, we think that the strength of BCN is providing a platform for interdisciplinary research and education, as it is there that most break-throughs occur. We do this by providing integrative platforms for researchers, as well as in our educational program. The latter is aimed at creating so called T-shaped researchers where the horizontal part of the T stands for broad knowledge to facilitate interdisciplinary communication, and the vertical part for deep knowledge to allow for research at the fore-front of a particular field. It is worthwhile to mention here that again

our ReMa has been evaluated again as the best top-master in neurosciences in the Netherlands (congrats to Jean-Christophe Billeter and all the teachers). To what extent our interdisciplinarity should encompass the medical neurosciences at the university of Twente is currently in debate, given the organizational hurdles and the lack of an increase in collaborations over the last years. We strive to establish BCN as a fifth research school at the university, in addition to the four newly established schools implemented recently by the board of our university. Several other new initiatives are at the moment under discussion.
We also hope to be able to acquire more finances for stimulating our interdisciplinary research projects. One first, albeit modest, step that we recently implemented, is a call for applications for interdisciplinary seed grants (see the recent announcement by email by Kuiper-Drent from November 10th) for which the deadline is already December 1st.

We will keep you updated about all these new developments and hope your personal and research conditions will not suffer too much from the recent covid situation.

- BY TON GROOTHUIS
- PHOTO BY SANDER MARTENS



What is "The One"?

The One is a newly introduced column which highlights 'the one' scientific paper that influenced individual BCN researchers. Wouter Kruijne (postdoc at the Faculty of Behavioural and Social Sciences) explains how his paper of choice changed his way of thinking and why it was so important and interesting to him.

Training the Brain by Making Memories

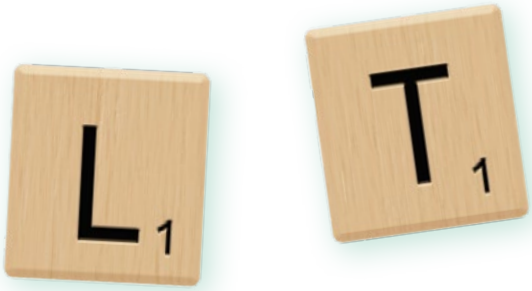
Judging by my research output, I think most people would generally describe me as a cognitive neuroscientist who uses experimentation, modeling, and some neuroimaging to study perception and cognition, with a strong focus on the visual system. In later years, I would seem to have shifted my focus somewhat to studying how we perceive time, and how we use time to guide behavior. That is a pretty accurate summary. However, these people do not know my secret, and trying to land on a paper that I would designate as being "The One" has forced me to confess everything to both myself and to you. The time has come to let the world know that I am, in fact, an Episodic Memory researcher in disguise. And I've known since I read "Contextual Cueing: Implicit Learning and Memory of Visual Context Guides Spatial Attention" published in 1998 in Cognitive Psychology by Marvin Chun and Yuhong Jiang.

I came across this paper during my PhD at the VU Amsterdam. I was supervised by Martijn Meeter and working in the group of Jan Theeuwes – a group with 99% visual attention researchers. I was working on Intertrial Priming of visual search: In short, when you search for visual targets that can be either red or green, randomly varying across trials, you tend to direct your attention to the color that you selected on the trial before. As a result, you are faster when the target color repeats, and slower when it switches. What is particularly interesting about intertrial priming is that it happens implicitly and automatically: even if you are told beforehand what the upcoming target will be, the past has strong effects on where you direct your attention.

One of the theories about intertrial priming – the one that seemed most outrageous to me – was one stating that it was not caused by some change in bottom-up vision, but that it was caused by episodic memories of the past trials. Somehow, retrieving these memories was supposed to have a strong effect on attention in an automatic and implicit way.

"The time has come to let the world know that I am, in fact, an Episodic Memory researcher in disguise."

I hope you can appreciate how ridiculous this sounded to a young vision researcher: To me, 'episodic memory' was something studied in experiments where participants were forced to remember long lists of words, and then spend immense cognitive effort to recall them all. How could such a sluggish mechanism play any role in guiding visual search, without us even noticing? And then... I read 'The One'.



In the Contextual Cueing paradigm, first introduced in that particular paper, participants are presented with a search task where they search for, say a letter T among twenty L's scattered across the screen. It's a difficult search task, but as the experiment progresses participants get better and better at it. What participants don't know, however, is that the layout of the stimuli isn't always random. Rather, there is a handful of configurations – layouts – that are repeated throughout the experiment. On the other half of the trials, layouts are truly random. And even though participants do not realize this, they eventually become much faster at finding the target on 'repeated' than on 'new' layouts.

The explanation for this effect? In each trial, a trace is formed in memory, which encompasses the layout and the location of the target. Upon the next presentation of the same layout, the 'context' triggers associative retrieval of the target location, which steers attention towards the location of the target. A participant's attention was directed by active memory retrieval, and they didn't even notice: in their experience, they were just repeatedly looking for T's among L's.

"In one of our most ridiculous studies, we found that episodic memories guided attention even a week later, despite us telling participants to stop relying on it."

After the search task, Chun & Jiang usually also put a recognition memory test at the end of their experiments, where people were asked to indicate whether presented layouts were old or new. Participants typically perform at chance level, illustrating that memories that can speed up 'search' still may be too weak to be 'recognizable'. However, in other experiments participants were presented with 'old' layouts with only L's, and were asked to indicate where on the screen they "felt" the target "should go". In these tasks, participants are weirdly above chance level. Martijn and myself found that the



effectiveness of contextual cues is diminished when the task goals change but the cues remain the same – suggesting that contextual cueing itself is cued by context. Last year, Eelke Spaak and Floris de Lange used MEG and directly related learning in the contextual cueing paradigm to activity in the hippocampus.

> *"To me, there is an inherent beauty in demonstrating how episodic memories can have strong effects on how we act, think, where we guide our attention."*

My discovery marked the first time that I seriously began considering how much of cognitive performance and learning, which we typically describe as 'procedural memory', might be driven implicitly and automatically by episodic memories of past trials. Martijn and I conducted several experiments that suggest that intertrial priming, too, might be automatically and implicitly driven from episodic memory. In one of our most ridiculous studies, we found that episodic memories guided attention even a week later, despite us telling participants to stop relying on it. Together with Sander Los, we took these ideas and applied them to research on temporal preparation; again, we found that support for an automatic and implicit contribution of past trials in shaping our temporal expectations. Together with Josh Salet and Hedderik van Rijn, we are trying to get a neural network implementation of these ideas published soon.

Throughout my years as an academic, other fields have begun to stress the importance of implicit influences from episodic memories in various cognitive tasks. Researchers like Florian Waszak and Cai Longmann have argued that episodic memories have long-lasting effects on task switching and semantic categorization. Nicholas Turk-Browne studies new ways in which episodic memories shape visual predictions and play a key role in what many researchers nowadays call Statistical Learning. Daphna Shohamy and Nathanial Daw study how episodic memories have strong contributions to value-based decisions, and might be a key factor in reinforcement learning.

To me, there is an inherent beauty in demonstrating how episodic memories can have strong effects on how we act, think, where we guide our attention, and on the decisions we make, i.e. on cognition, and seemingly do so, for a large part, without our volition and outside of our awareness. I think this insight holds immense potential to exploit and thereby discover new ways to improve our performance on cognitive tasks, by cleverly translating the insights we have gained from all the research on recognition memory, retrieval and mental time travel, ever since the work of Ebbinghaus. I believe these fundamental findings can improve on the ways in which humans currently learn to acquire all sorts of new skills. Moreover, I believe that finding ways to evoke 'the right' episodic memories can potentially be a powerful tool in aiding people in cognitive tasks whenever they struggle to interpret explicit instructions.

In short, Chun and Jiang's Contextual Cueing paper has given me a new perspective on the future of cognitive science: it has made me see the T through the L's, and has showed me that the future is built on episodic memories.

- **BY WOUTER KRUIJNE**
- **PHOTO BY WOUTER KRUIJNE**

NEW STAFF WRITER

SOPHIE VAN ZONNEVELD



The fact that the body is able to transform an incredibly tasty piece of food into something foul like faeces has interested me since my childhood. Not that I have anything against faeces, in fact, our stools say a lot about our health. So, I recommend to check yours regularly after a visit to the toilet. Anyhow, during my Master's studies in Behavioural and Cognitive Neuroscience at the University of Groningen, my fascination with the possible influence of nutrition on mental well-being and functioning increased even more. It is generally said that healthy food, sufficient exercise, social community, and reduced stress are important factors for a healthy lifestyle. But what if you are affected by a brain disorder? What can nutrition mean then? That is why I applied for my current PhD position in the No Guts No Glory project supervised by Iris Sommer. In the coming years, I will focus on the effects of an anti-inflammatory diet on the gut health functioning and well-being of people with brain disorders.

Besides nutrition, I am intrigued by biopsychological determinants of sexual health. Both Ellen Laan and Esther Perel (and 'our' Janniko Georgiadis of course) inspire me enormously in this field. How do (romantic) relationships work? And what makes sexual pleasure different from other types of pleasure? Questions that I like to think about in my leisure time. Additionally, I love to be active and outside doing sports, and walking (with the dog). I am crazy about dogs. Writing this reminds me of the Netflix Explained episode about dogs, which I really recommend. I am very happy to become one of the BCN staff writers. Once upon a time, my father was the editor-in-chief of this newsletter. Unfortunately, he will not see me step into his shoes, but I am looking forward to continuing this. Apart from that, I hope to learn a lot about science communication and improving my writing skills. I consider it a privilege to be able to think and write about such interesting scientific topics.

- BY SOPHIE VAN ZONNEVELD
- PHOTO BY SANDER MARTENS



You gotta risk it to get the biscuit

After finishing the BCN research master N-track, my next chapter began in a cottage somewhere in the forests of Drenthe. I hired a tiny holiday home in the middle of nowhere as a sort of 'job application retreat', with the goal not to leave it until I had found my dream job. After scrolling endlessly on LinkedIn, Academic transfer and ScholarshipDb, I decided in a slight act of desperation, since Covid also affected the job market, to simply google "Neuropsychiatry job". There it was, a description of a PhD position that fitted my interests like a glove. The only thing that made me doubt to apply, was that the research group offering this job was based in Antwerp, Flanders. I had never been to Antwerp before, had no idea who these professors were, and where I would end up for the next 4 years. However, I also knew that finding the perfect topic in the exact city you want, is a luxury not many of us scientists will have. After googling Antwerp and finding out it was basically glued to the Dutch border, my eye landed on the engravement in my wallet: 'You got to risk it, to get the biscuit!'. This quote, a present my friends gave me once, was the final push I needed to chase this scientific career. After the job interview the professor soon called me asking when I could start, and three weeks later I moved to Antwerp to find out where I signed up for.

The research group is located at a University Psychiatric Hospital,

"After googling Antwerp and finding out it was basically glued to the Dutch border, my eye landed on the engravement in my wallet: 'You got to risk it, to get the biscuit!'"

"While I did otherwise, I would still give the advice to master students looking for a PhD, that a 'symbiotic' supervisor is of major importance!"

connected to the University of Antwerp. In this center there are severely depressed and psychotic patients that are treatment resistant (they tried many medications and therapies, which did not work). This patient group has another option: electroconvulsive therapy, a treatment course consisting of a series of short electroshocks applied on the brain under full anesthesia. The vast majority of these patients benefits from the treatment, but the exact mechanism explaining why a series of artificial seizures helps to get rid of the dark clouds in someone's head, is still a mystery. Several theories exist, and my project is about finding more pieces to this puzzle. It involves a bunch of clinical and cognitive questionnaires, and in our small but well-equipped laboratory (or 'labo' as they call it in Belgium) we search for biomarkers in blood samples like neuron-derived exosomic vesicles, inflammatory markers, and other possible involved -omics. In my opinion this project is the perfect combination of putting the lab skills acquired during BCN to practice and getting to know the patient behind all the articles you read about on depression and psychosis. Although getting these patients to sign up for your study is not an easy road, with some of them being highly melancholic, and others thinking they have to jump out of the airplane at that very moment, psychiatry is a fascinating field to work in. Seeing the madness and sadness disappear and a grateful individual return is highly rewarding, and a great motivation for all the long and stressful days one can have in the PhD rollercoaster.

While writing this column, I remembered that they always told me that a PhD supervisor with whom you can collaborate well is more important than the exact topic of your research. Looking back on this leap of faith, I got very lucky with my two promotors who are two fairly young professors, one psychiatrist and one biologist. Although the challenge is to get them on the same page sometimes, it is the perfect cutting edge of disciplines, and I think these kinds of collaborations are the right fit for BCN students. So, while I did otherwise, I would still give the advice to master students looking for a PhD, that a 'symbiotic' supervisor is of major importance! Also, the Belgians are very fun to work with, and although we always make jokes about them in the Netherlands, the researchers I met in the lab will outsmart many. After all, it seems that I betted on the right horse, and I am very thankful for being able to learn more about Neuroscience for another three years.

Finally, I could not help it to sum up some very interesting books that might fit your interest:
The Inflamed Mind – Edward Bullmore (If you are into neuroinflammation)
The no-nonsense meditation book – Steven Laureys (A Belgian Neurologist showing the effect of meditation with brain scans)
Good Reasons for Bad Feelings – Randolph M. Nesse (Insights from Evolutionary Psychiatry)

If you have any questions or tips about Psychiatry research, PhD life or Antwerp, don't hesitate to contact me: annelies.dellink@uantwerpen.be!

- **BY ANNELIES DELLINK**
- **PHOTO BY KATRIEN SKOROBOGATOV**

Health Technology Research and Innovation Cluster Groningen

Health technology
for more healthy years of life
we are HTRIC

The northern part of Netherlands is known to be innovative when it comes to tackling issues and problems that have a long-term effect on human life. Healthy ageing has been a goal that the northern Netherlands has been pursuing with clusters in Roden, Leeuwaarden, Drachten and Groningen. With the new Health Technology Research and Innovation Cluster (HTRIC), all the different agencies working towards the challenges in healthcare will be brought together cohesively. The cluster involves the medical/technological expertise from the University Medical Centre Groningen (UMCG) and several faculties within the University of Groningen, along with other educational institutes in the city. This is combined with the fast-growing health entrepreneurial network that is present in the north. The cluster aims at combining the elements of research, education and entrepreneurship in order to promote innovative developments in healthcare that can go from bench to bedside and vice-versa quickly and efficiently.

The goal of the innovation cluster is to promote healthy ageing throughout everyone's lifetime. This is enabled by improving the knowledge we have about the ageing process through thorough research and developing technologies that can support people in their daily life. The focus of the team is on the entire chain: from the societal and clinical demands in this area to fostering ground breaking innovations and human applications of ideas.

HTRIC has divided research into three development programmes, all of which focus on the interaction between knowledge, technology and business development within the programmes. These programmes are highly ambition driven and have a broad impact over a large timeline in human life; from healthy living to prevention and monitoring of health, as well as diagnosis and treatment. The programmes are divided into three parts: 1) The operation theatre of the future, which focuses on surgical techniques such as robot-assisted operations and robotic surgical systems; 2) Replacement and improvement in the human body, which looks into innovative biomaterials and nanotechnology such as supramolecular polymers for applications; and 3)





Innovative technology with local precision, which works on observing, monitoring and targeted treatment options such as sensitive sensors and imaging tools.

Sjoerd Bultstra, Professor of Orthopaedics at the UMCG, is associated with the operating theatre of the future which is the first programme. But he also sees himself working towards the second and the third programme. “Over time, we can also think about adding more programmes to the mix. These programmes are not single entities in themselves”, says Bulstra. He is part of the research team at HTRIC and also one of the founders. The idea of starting HTRIC was initially centred around improving the connection between the Faculty of Science and Engineering and the University Medical Centre Groningen. He remarks that there is so much new research being done in the University faculties at FSE and UMCG, as well as the other institutes in the city, but they have a hard time turning them into practical applications that can be used for society or patients. The final step of developing a new product is the most difficult one. Proving scalability of the product is often very crucial and usually underfunded. He

“The cluster aims at combining the elements of research, education and entrepreneurship.”

envisions this cluster to become a movement that brings new insights through a multidisciplinary and collaborative approach, combining the practicality with which a doctor/clinician works and the focus and acute precision of a fundamental scientist.

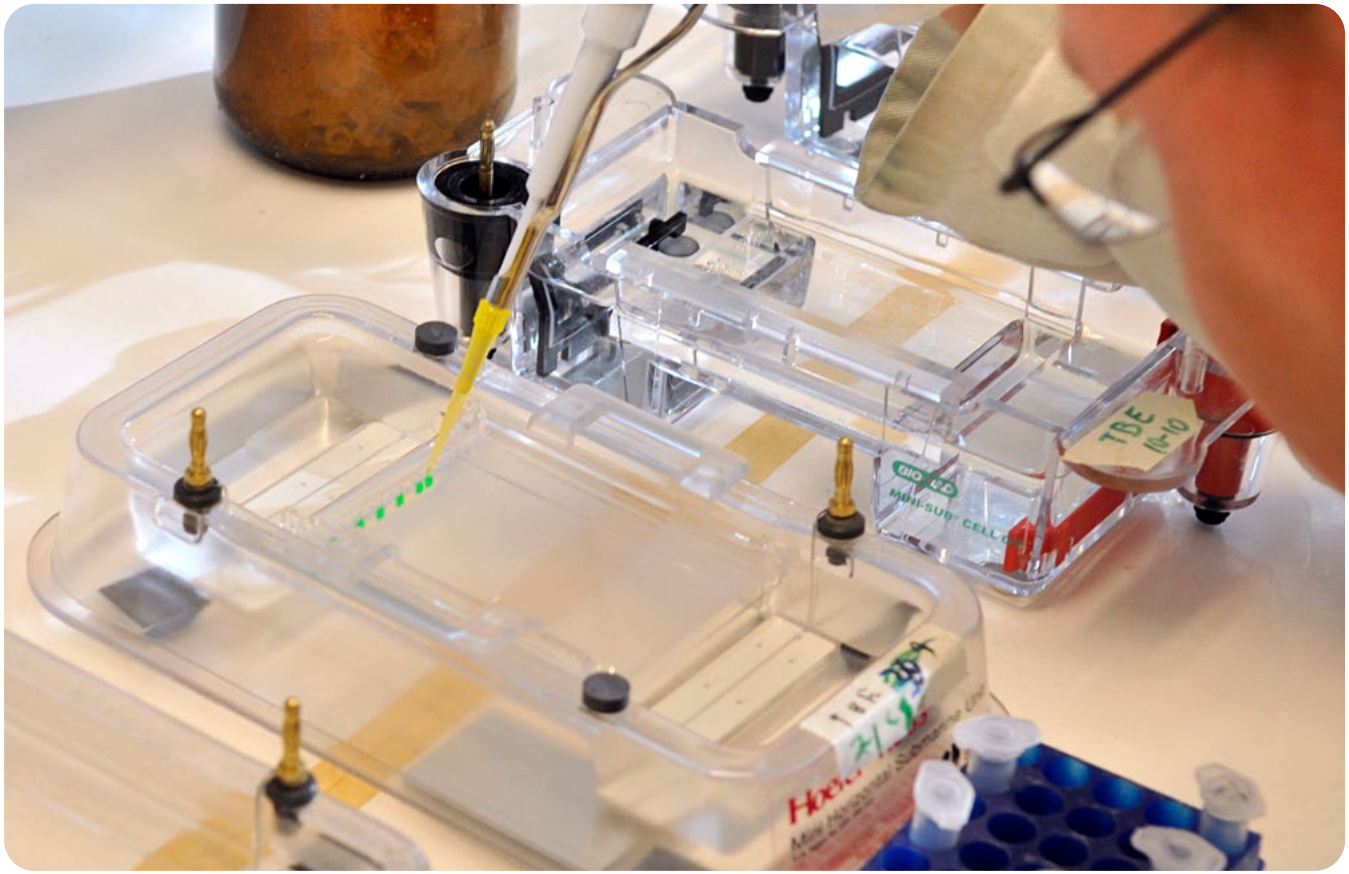
HTRIC has already connected with about 200 companies in the north as well as the rest of the country. These companies bring in important influx of capital as well as commercial resources. What they lack in problem solving and research is provided by the robust academic atmosphere of dedicated investigators and students who can find solutions of the problems faced by these companies. This synergistic relationship is further nurtured and developed by HTRIC in order to bring innovation that much closer to the people that need it. The Innovation centre for HTRIC will be set up in the northern part of the UMCG complex along with a part in the Zernike complex. The centre will contain specialized clean labs and regular laboratory rooms that will help students work on developing products and also be able to test these without wasting a lot of time. Projects working on specific areas of the development programmes are already underway and positions for students might open up as soon as next year. An invitation for proposals will also come up very soon.

"HTRIC has already connected with about 200 companies in the north as well as the rest of the country."

Bulstra's vision for HTRIC is to turn it into a place that brings people from different backgrounds in one place where they are able to learn and exchange ideas and collaborate to generate applications for patients. HTRIC aims at improving the health technology landscape in the north and eventually use these technologies in the Netherlands and the rest of the world.

For more information and to look into the innovation cluster and its other members, visit https://htric.com/en/

- **BY ESHITA SENGUPTA**
- **PHOTO S. BULSTRA BY SJOERD BULSTRA**



REPORT

Nothing but the Truth

On the 1st of November BCN hosted a symposium focused on truth and trust in science. In four plenary sessions and twelve workshops, a wide range of topics was discussed such as open science, journals' role in guarding scientific validity, science and statistical communication, as well as tips and tricks for best data visualisation and academic pitches. Speakers included John Ioannidis, Eric-Jan Wagenmakers, Heather Douglas, Hanneke Hulst, Casper Albers, Ionica Smeets and many others.

● PHOTOS BY SANDER MARTENS



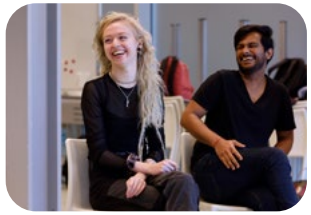


















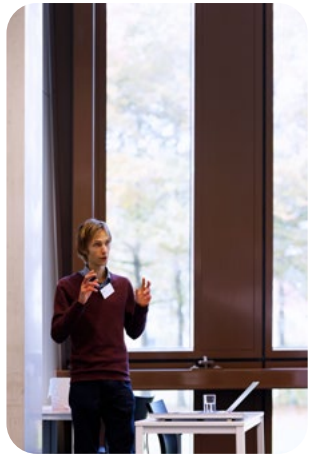




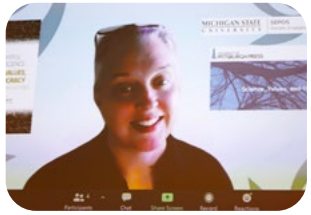












The illusion of objectivity and the dangerous reality of implicit bias

Mindwise organizes regular Science Communication Workshops for BSS students at all levels—from the bachelor to the PhD. Participants learn to engage the public in psychological science by means of informing, sharing an opinion, and relating scientific findings to issues in society.

A selection of these blog posts is published on Mindwise, and the best are often republished elsewhere. This contribution is by Lea Kutscher.

The other day, my best friend sent me a message saying "Google knows" with a picture attached. I opened the message and saw a screenshot depicting a group of girls. They were posing in front of a Holocaust memorial. Included was a quite shocking caption that I will not repeat here.

My friend's phone suggested that this was a picture of me, but the resemblance wasn't obvious. The girl in the picture was only algorithmically similar: even though a human would never mistake us, the computer had made a match.

Obviously, the facial recognition systems on our phones are not sufficiently refined to be 100% accurate. They're offered as a service; to make it easier to find ourselves and our friends. Yet there are consequences when these systems are trusted unthinkingly. So let's consider facial recognition systems used in the criminal justice system: an application that is far more serious than my friend's personal camera roll.

Closed-circuit television cameras (CCTV) are used for security purposes around the world, often in combination with facial recognition systems, and these allow the police to track down a wanted person more efficiently. However, there is an issue with their accuracy; especially with the conditions in which they are inaccurate. This is a particular problem when these systems are accepted as sources of objective testimony; as evidence.

Briefly, the problem is this: the data that are fed into the algorithm during its creation only include samples of specific types of people. Often the data consists of the most common majority group in the place in which the algorithm is being created.

So what does that mean? Although I am definitely no expert in the complexity of algorithms, the case of the facial recognition systems used in the UK's public domain is very well explained by Big Brother Watch (Big Brother Watch UK, 2020; Cavazos et al., 2021; Institute Montaigne, 2020; Lum & Isaac, 2016; Mittelstadt et al., 2016).

In short: the majority of these systems are developed through a semi-automated process called "machine learning". The programmer provides the sample data: picture of peoples' faces, which are pre-categorised. The algorithm is then trained on this dataset, taught to identify different faces, and then match new ones to their pre-established categories. Then the algorithm is

let loose, in the wild, and expected to learn how to identify faces with new input from the street: to match them as well as to categorise them.
Most of the time, however, these sample data are biased. Of course, this isn't added on purpose; it just reflects the creator's environment.
In the case of policing data, for example, the data are produced as a by-product of normal police work. So the categories against which a new face might be matched are overwhelmingly criminal, and that bias carries forward to taint the rest of the process: "because the computer said you robbed the bank, it's on you to prove that you didn't". (A reversal of the usual assumption of innocence until proven guilty.)
In other words: data output can only be as reliable as the data input, and the results are sometimes unjust. The catch is that the introduced bias is also difficult to reverse. Even if we start "feeding" the algorithm with more diverse data, the initial bias persists inherently. It becomes entrenched. And as they say: garbage in, garbage out.
It's not hard to imagine an innocent child, walking home from school, being stopped and searched by the police solely because of how they look. Then take that a step further: how are the police likely to react when the algorithm has already said that child was a possible match for a shoplifter?
This is more likely to happen with ethnic minorities. Because they are typically underrepresented in the original data sample that trained the software—before the addition of the criminal database—meaning those matches are typically less precise; fuzzier.
These problems are not only restricted to facial recognition algorithms, nor to the UK. There are other



algorithms which contribute to risk analyses (i.e. assessing the likelihood of reoffending). These then help policy makers decide where police officers should be distributed on patrol, via geographic crime prediction systems, and thus also where someone is more likely to be fuzzy-matched.
These systems are even used to try to predict crime before it happens; to promote interventions prior the actual criminal offense. So people are stopped, and detained, on the basis of the algorithm's often-faulty judgment.
While most of you are probably concerned about the impact such biases have on our society, particularly regarding systemic discrimination within the criminal justice system, some of you might not feel personally affected. So here's the bad news: we all are affected by the biases of algorithms regardless of our ethnic background. Why? Well, because most search engines, web shops, etc., use our data to target our interests and present us with relevant content. However nice that sounds, it is dangerous, as it leads to self-confirm our own beliefs: the "echo chamber", which has arguably broken modern politics, is the result of algorithmic bias too. Self-confirmation biases are inherently human and are automatic processes affecting us all. In a world that becomes more complex, and with publicly accessible platforms allowing everyone to share their opinion and thoughts to the whole world, this can be problematic. This is not to say that we should all shut up unless we can be unbiased and objective—which is impossible anyways—but we should indeed be critical. We shouldn't be blindly trusting these programmes that don't allow us an insight into their decision-making processes.

I don't mean to say that we should demonise these innovations. However, if we simply use these programmes for important processes in our life without any critical thinking, we are taking uncalculated risks that are impossible to assess until, well, after it's too late (Mittelstadt et al., 2016).

Of course, it is understandable why we would like to trust the algorithms. We strive for the "objective truth." And we all do it; whether you are trying to find the truth behind why your friends' date ghosted them, or because you want to know why you are hungover although "you did not drink that much" (or "I had lots of water!"). Yet despite this aspiration to truth, we are also lazy and, if possible, we prefer using mental shortcuts. Algorithms with their illusion of objectivity seem like the perfect solution. Nevertheless, algorithms are man-made, and just like humans, can include the biases we carry onto them. What I am trying to say is that while an instance of me being wrongly identified in a controversial and inappropriate picture might be "funny", these mistakes do not stop with your phone. We rely on algorithms and similar technologies in all areas of our individual and collective lives, and we introduce them into the world without completely understanding them or the consequences they bring with them. Although we should not stop innovation, we should also never stop being critical of the limits of our own capabilities.

- **BY LEA KUTSCHER**
- **PHOTO BY SANDER MARTENS**

Originally published by Mindwise

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LEA KUTSCHER
Lea is a Psychology student in her last year of her Bachelor, primarily interested in Social Psychology – mainly relating to group dynamics, discrimination, and culture – while also showing interest in current political and social matters. Outside the more serious matters in life, she enjoys time spent in good company, travelling, cooking, and music.

CALL FOR VOLUNTEERS

Groningen Brain Olympiad 2022

Do you want to share your excitement for science, gain experience in science communication, and help inspire a new generation of behavioural and cognitive neuroscientists? Then we are looking for you!

The inaugural Groningen Brain Olympiad takes place on February 12 in Groningen. On this day, secondary school students from around the North will visit Groningen to take part in a challenging competition testing their knowledge of the brain. In addition, we want to give them a taste of the exciting research that is happening in Groningen, including exhibitions and a keynote speaker.

We are looking for students and staff who want to give a brief practical demonstration related to their research or interests, suitable for an audience of 16-18 year-olds. Some suggestions: looking at cells through a microscope, an EEG or eye tracking demo, explaining optical/auditory/tactile illusions, conducting behavioural or cognitive tests. Your own ideas are of course very welcome! If you don't yet have a concrete idea of how to showcase your work, we're happy to discuss ideas with you. Demos can be given in English or Dutch. If you'd like to participate, please email us at the address below by 31 December 2021.

If you are interested in helping out in the preparations or on the day itself, we also encourage you to reach out to us!

Email us: hersenolympiadegroningen@gmail.com
More information: hersenolymiade.nl

Thank you!

The Groningen Brain Olympiad 2022 team: Marie-José van Tol, Marieke van Vugt, Iris Tigchelaar, Takuya Oshima, & Maarten van der Velde.

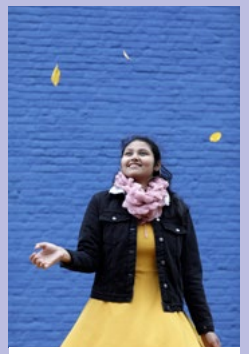
NEW STAFF WRITERS WANTED!

Do you enjoy reading the BCN magazine?

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, a.d.j.martens@rug.nl!


SANDER MARTENS


EVELYN KUIPER-DRENTH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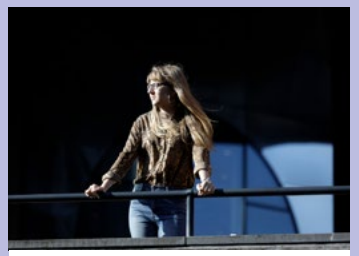
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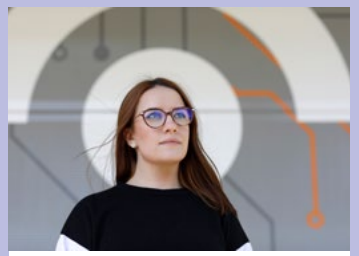
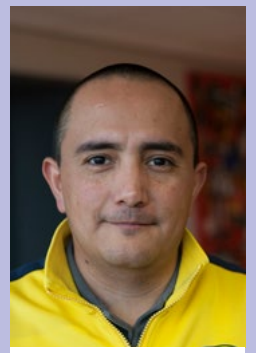
KARINA KÖPKE


ABIGAILTOTH


MARLIJN BESTEN


KAVYA PRASAD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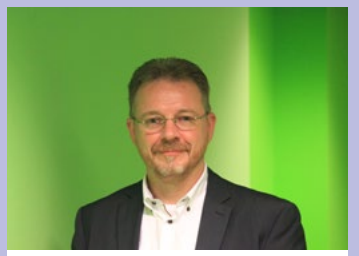
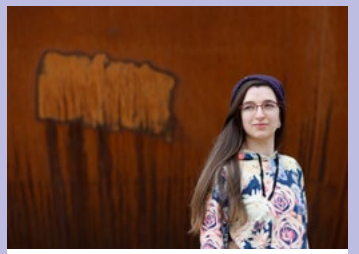
ANNA NEUSTAETER


MICHIEL HOOIVELD


SOPHIE VAN ZONNEVELD


SOPHIA WILHELM


LAUREN HANSEN-MANGUIKIAN

NEW STAFF WRITER

KARINA KÖPKE



Having always been curious about the workings of the world around me I decided to pursue a career in science. By studying biology I learnt a great deal about how not only plants, but animals and thus humans work. After studying a semester abroad at Dalhousie University in Canada, I was eager to start the next part of my education abroad as well. It was during that time that my fascination with the brain manifested itself, especially in how diseases arise and affect the brain. Combining this interest with my biology background, I decided to study Molecular and Clinical Neurosciences here at the RUG.
I was one of the students that came in during the pandemic and had their whole first semester online, nevertheless I thoroughly enjoyed the diversity of people I met, as well as the variety of courses. I recently finished my minor thesis in the Eisel group and am looking forward to starting my second year of BCN.
In my free time I like to be active and outside, most often combining these by playing soccer for almost 20 years now. I am glad to get the opportunity to join the BCN Newsletter and increase my knowledge and skills in communicating science.

- BY KARINA KÖPKE
- PHOTO BY SANDER MARTENS

COOL LINKS

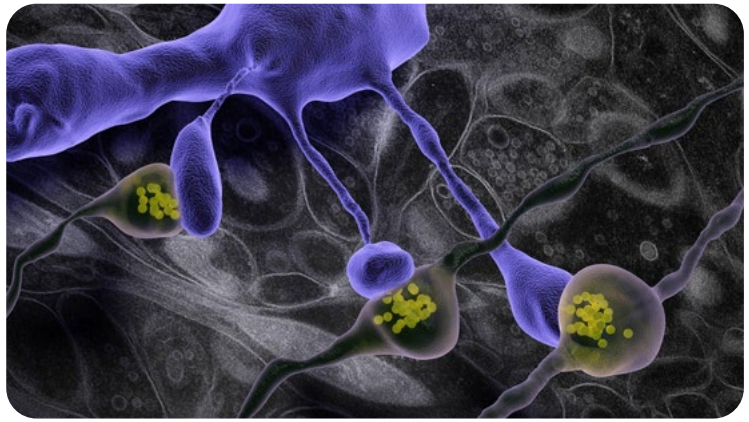
Live imaging method brings structural information to mapping of brain function
https://picower.mit.edu/news/live-imaging-method-brings-structural-information-mapping-brain-function

Snap-freezing reveals a truer structure of brain connections
https://actu.epfl.ch/news/snap-freezing-reveals-a-truer-structure-of-brain-c/

Wyss Center: Peeking inside 'mini-brains' could boost understanding of the human brain in health and disease.
https://wysscenter.ch/updates/peeking-inside-mini-brains-could-boost-understanding-of-the-human-brain-in-health-and-disease

Routine eye scans may give clues to cognitive decline in diabetes
https://www.joslin.org/about/news-media/routine-eye-scans-may-give-clues-cognitive-decline-diabetes

Using an open science, multi-scale, team-oriented approach, the Allen Institute focuses on accelerating foundational research, developing standards and models, and cultivating new ideas to make a broad, transformational impact on science.
https://portal.brain-map.org/



True structure of the connections that join neurons together in the adult brain.

GRAND STUFF

BCN best national Research Master Neuroscience

We are very proud that the BCN Research Master once again obtained the top score of the Netherlands Neuroscience Masters (Keuzegids Master 2021)!
https://www.keuzegids.org/ol/gidsen/ma21/2852

wo Researchmaster neuroscience																	
Groningen RUG	Behav. & cognitive neurosciences (res)	37	60,5	vt	En	++	++	+	+	++	+	+	+	++	++
Amsterdam UvA	Brain & cognitive sciences (res)	39	40	vt	En	+	+	o	++	++	+	+	o	++	++
Maastricht UM	Cognitive & clinical neuroscience (res)	129	82,2	vt	En	o	-	o	+	o	-	+	+	+	o
Amsterdam VU	Cognitive neuropsychology (res)	16	52,1	vt	En	o	o	+	+	o	o	+	o	o	+
Nijmegen RU	Cognitive neuroscience (res)	42	45,5	vt	En	o	- -	-	o	o	o	o	o	-	+
Rotterdam EUR	Neuroscience (res)	18	34,5	vt	En	o	o	o	++	+	-	o	++	- -	o
Amsterdam VU	Neurosciences (res)	50	42	vt	En	+	o	+	+	o	o	o	o	+	+
Hbo-master																	
NCOI Hogeschool	Toegepaste psychologie voor professionals	<5	nb	dt,du	Ne										

Voor toelichting en bronnen zie de icoontjes bovenaan deze tabel, de leeswijzer, de verantwoording, of de methodiek

- = ondergemiddeld, o = gemiddeld, + bovengemiddeld

App to keep 'Gronings' dialect alive

Martijn Wieling launched a new app to help children at primary school in Groningen to speak the local dialect. It featured on television in the Jeugdjournaal (a national news show aimed at children), radio (RTV Noord) and newspaper (Dagblad van het Noorden; Noorderkrant).

Kinderen in Groningen leren wat 'kopstubber' en 'bozzem' zijn (TV). Jeugdjournaal, 28 October 2021.

'Vriend van de koning' lanceert app waarmee Groninger schooljeugd 'van old noar jong' de eigen streektaal machtig wordt (newspaper). Dagblad van het Noorden, 28 October 2021.

Martijn Bartelds op RTV Noord (radio, from 11 min). RTV Noord, 30 October 2021.

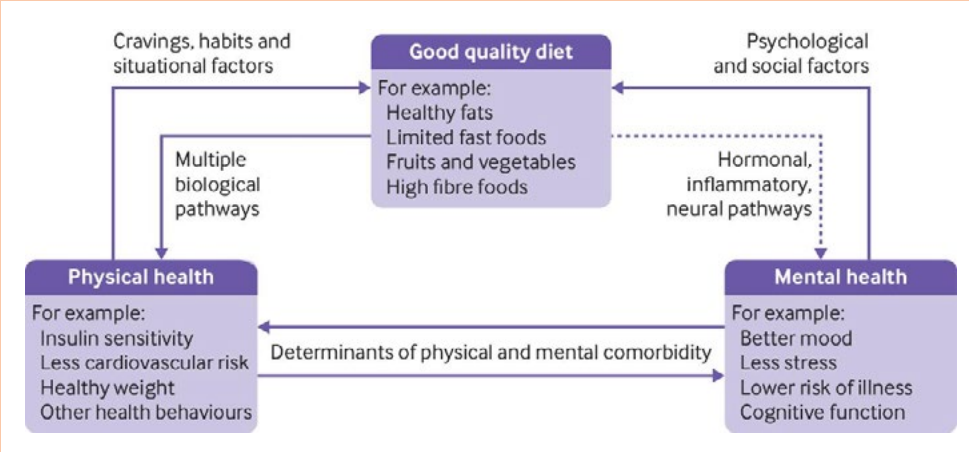
Commissaris van de Koning René Paas neemt Groningstalige app voor schoolkinderen in Zandeweer in gebruik (online). Noorderkrant, 20 October 2021.



Nutritional psychiatry: mind what you eat

Some individuals seek complementary treatments such a food-mod interventions, in addition to allopathic medications in order to improve mood and anxiety. There is truth in the saying, "you are what you eat". Anatomically speaking, the vagus nerve which is a type of cranial nerve, essentially has parasympathetic control of the heart, lungs and digestive tract. This nerve acts as a two-way highway by sending signals and chemicals. Stimulation of vagal afferent fibers in the gut has an influence on monoaminergic brain systems that play crucial roles in psychiatric conditions. A good quality diet has an influence on the mental health via several hormonal, inflammatory and neural pathways.

"Our brain is an organ with very high nutrient and metabolic demand"

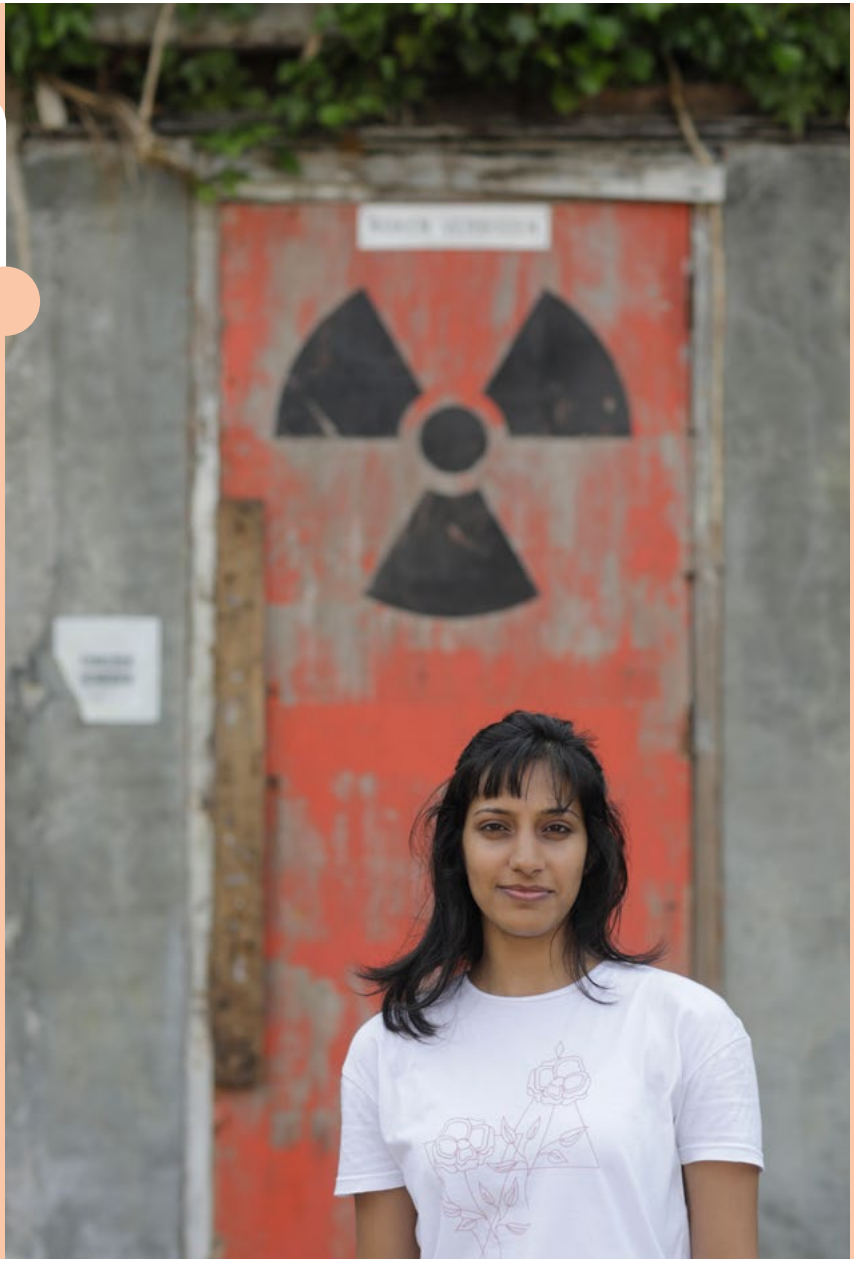


Our brain is an organ with very high nutrient and metabolic demand. In one such demand for our brain is brain derived neurotropic factor (BDNF). BDNF levels are low in a number of mental disorders such as PTSD, Schizophrenia and Alzheimer's dementia. This protein also plays a role in functions such as neuroplasticity, neural survival and growth and differentiation. In studies that evaluated the relation between consuming different nutrients and BDNF concentrations, they found out that polyphenol compounds (present in Ginkgo biloba, green tea, dark chocolate) showed significant increase in BDNF concentrations.

What does the brain have to do with our gut?

Nutrient packed food adjusts three major factors: reduction of brain inflammation, better regulation of serotonin and mood-boosting via dopamine. It's as if there are two brains (the Enteric nervous system being the second brain) and that they talk to each other. In 2006, Jane Foster discovered something that would soon create a buzz in her

"Jane Foster discovered something that would soon create abuzz in her field of neuroscience"



field of neuroscience. She worked with two groups of mice: one with a healthy selection of microorganisms in their guts, and one that lacked a microbiome. Her team noticed that the mice without gut bacteria seemed less anxious than their healthy equivalents. When placed in a maze with some open paths and some walled-in ones, they preferred the exposed paths. They concluded that the bacteria in the gut seemed to be influencing their brain and behavior.

Food for Your Mental Health

Key types of food that improve mental health include fibers, such as beans and legumes, Vitamin D, Protein such as lean meat, eggs, yogurt and Omega-3s, can help lower cholesterol and improve mood and cognitive functions.

Controlling your diet, along with exercising are simple ways to improve cognitive function and performance on a daily basis. Minding what you eat and drinking plenty of water seems to be the best way to improve gut health. It might take your gut time to get used to a new eating pattern. So we have to make these changes slowly to give ourselves time to adjust.

- BY KAVYA PRASAD
- PHOTOS BY SANDER MARTENS

PHD AND OTHER NEWS

Compensation GMW for teaching PhD students

Good news for instructors of the Faculty of Behavioural and Social Sciences (BSS)!! BCN and the Faculty Board of BSS have agreed to start compensating teaching for PhD students in the BCN programme, in teaching time. The exact amount of day-parts will be determined by the Psychology directorate. BCN is pleased that PhD teaching is not just a 'voluntary' activity anymore!

Reimbursement of small amounts for courses

If you like me to reimburse course invoices lower than 30 euro, I would like you to bundle this with other reimbursements using a single form. It is not a problem if these small amounts are not sent within 3 months.

BCN Lunch Lectures

We will continue to organize these lectures, and we are still open for suggestions for speakers!!! Please let us know whom you would like to invite for a BCN lecture! Let us know if any of your alumnus students is willing to give a presentation on their current career!

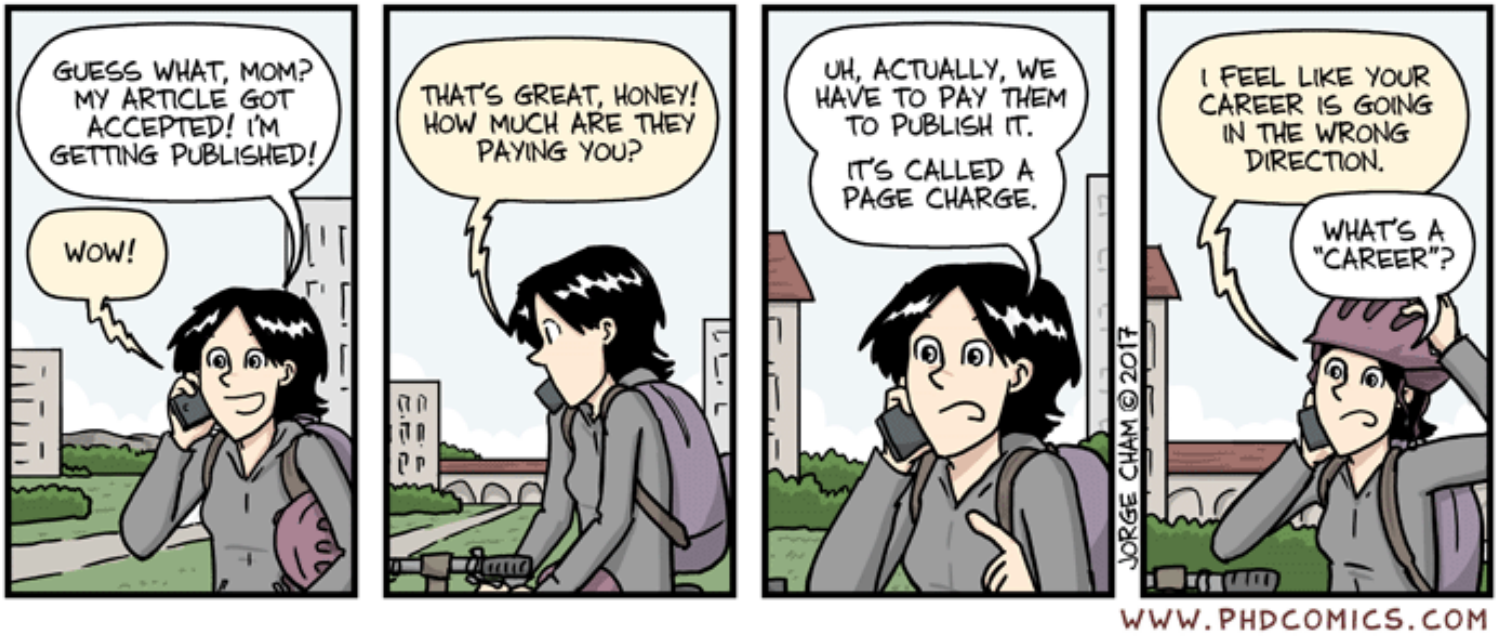
Agenda BCN Activities

February 3, 2022: BCN Winter Meeting including BCN Poster Presentation
Every Thursday: BCN Lunch Lectures series: 12:00 – 13:00 hrs.

● BY DIANA KOOPMANS

BCN Poster Presentation & BCN Winter Meeting

We already scheduled the BCN Winter Meeting: February 3, 2022. The BCN Poster Presentation is part of the Winter Meeting. We hope that we will be able to organize this event in a lecture hall, if not we will meet each other again in Gather Town. You will be updated.



NEWS FROM THE BCN PHD COUNCIL

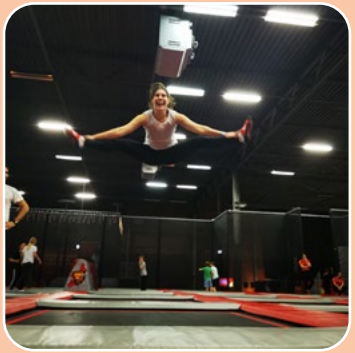
Hello fellow PhD student!

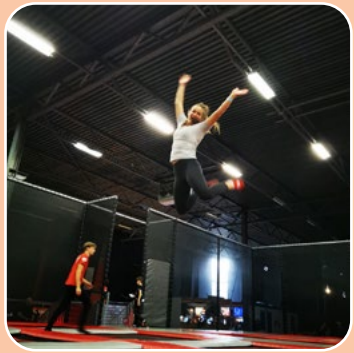
After summer holidays, we knew that the weather would only get worse! We, the BCN PhD council, organized some nice events taking this into account! First, we summoned all the interested people to an indoor-trampoline jumping experience at Jump XL. During this event, we got to know some new faces of the BCN research school but also some more senior students that will finish their PhD studies in the upcoming 6 months! It was a fun networking experience where we jumped and performed crazy stunts! All fifteen attendees reported that these types of in-person events provide a nice break from the online environment that we have built in the previous months. We will for sure organize more fun activities like this, so please join next time!

We additionally, organized a networking lunch/café at Zondag! We will also have more physical lunch meetings to encourage contact among BCN PhD students.

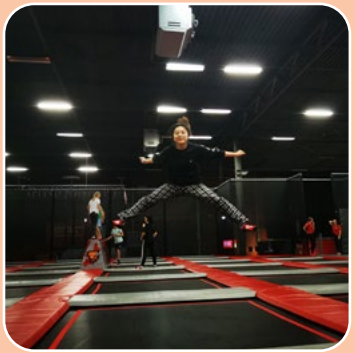
Tot later!















Translational Molecular Imaging, in particular with PET

ORATION
E.F.J. (Erik) de Vries
TITLE
You can't see it until you look
CHAIR
Translational Molecular Imaging, in particular with PET
FACULTY
Medical Sciences
DATE
November 9, 2021

Scans are the modern eyes of physicians; they allow them to see inside patients' bodies. Molecular imaging techniques, such as the PET scan, can not only visualize structures of tissues, but also physiological and biochemical processes and thus the function of organs. PET scans are not only used for the diagnosis and follow-up of patients, but can also play an important role in, for example, the efficient use of expensive medicines. Which process is depicted on the PET scan is determined by the radioactive tracer used in making the scan. In theory, a PET scan can image any process in the body, provided a suitable tracer is available for that process. However, suitable tracers have yet to be developed for many applications. This is the field of translational molecular imaging. The development of a tracer for a new type of PET scan is very similar to the development of a drug, but with a number of additional challenges due to the specific properties of the tracer. Translational molecular imaging also includes the application of new or existing PET scans in translational research into disease processes or new drugs. A PET scan can not only provide important information about a drug, such as the optimal dosage, but scans can also be used for patient selection and to determine the effectiveness of the drug. PET scans offer many possibilities, but we can only realize these by combining expertise from many disciplines.

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



● PHOTO BY COMMUNICATION UMCG

BCN THESIS DEFENCES

Bilingualism and contact-induced language change: exploring variation in the Frisian verbal complex

PHD STUDENT
L. Reitsma
THESIS
Bilingualism and contact-induced language change: exploring variation in the Frisian verbal complex
PROMOTOR
Prof.dr. C.L.J. de Bot
COPROMOTORS
Dr. N.H. Hilton
Dr. E. Hoekstra
FACULTY
Arts

This study investigates language variation and change in a bilingual community. It presents an unprecedented amount of data on the developments in the Frisian verbal complex, providing us with ample evidence of linguistic variation and language change.
Reitsma shows that besides Dutch-like structures new variants appear. She investigates the contribution of different social and linguistic factors to the use of these variants. Reitsma demonstrates that in the case of the verbal complex of Frisian, the only social factor that plays a role is age. Besides that, she finds a number of linguistic factors that influence the developments.
Another remarkable finding is the large-scale cluster reduction in certain tripartite verb clusters. According to Reitsma, this could be due to linguistic insecurity. She relates this linguistic insecurity to the distance between the standard and the spoken language and coins the term 'paradox of the norm'. This paradox refers to the tension between norm setting and language change (or preservation). On the one hand, a large gap between Standard Frisian and the Frisian used in daily life may cause linguistic insecurity, which promotes language change, but on the other hand, bringing the standard closer towards the spoken language could decrease the typological distance between Frisian and Dutch and thus also promote language change.
Reitsma concludes that the changes in the Frisian verbal complex cannot be directly attributed to contact with Dutch, although the omnipresence and status of Dutch may have had its (indirect) impact on the inclination to changes in Frisian.

Liefke Reitsma (1977) defended her thesis on August 26, 2021.

Exploring novel strategies to rescue coenzyme A deficiency-related diseases in *Drosophila melanogaster* models

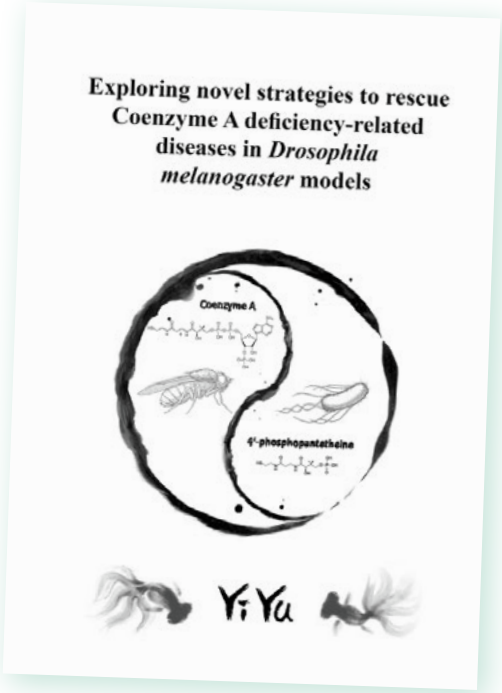
PHD STUDENT
Y. Yu
THESIS
Exploring novel strategies to rescue coenzyme A deficiency-related diseases in *Drosophila melanogaster* models
PROMOTOR
Prof.dr. O.C.M. Sibon
COPROMOTOR
Dr. H. Schepers
FACULTY
Medical Sciences

Coenzyme A (CoA) is a crucial molecule for many cellular metabolic pathways in all organisms including humans. The canonical biosynthesis of CoA constitutes



PHOTO BY YUEQU ZHANG

five enzymatic steps from the substrate pantothenate. These five enzymes, in the order of each subsequent catalyzed step, are pantothenate kinase (PANK), phosphopantothenoylcysteine synthetase (PPCS), phosphopantothenoylcysteine decarboxylase (PPCDC), phospho-pantetheine adenylyltransferase (PPAT), and dephospho-CoA kinase (DPCK). In eukaryotes like fruit flies, mice, and humans, PPAT and DPCK are combined into one enzyme called COASY. Mutations in PANK2, PPCS, and COASY cause three different human diseases. This thesis uses fruitfly models to explore the pathophysiological characteristics of CoA biosynthesis deficiency-related diseases, and aims to identify potential treatment strategies to cure or relieve these diseases. We studied several fruit fly models and were able to link four neurodegenerative diseases to the CoA-mtACP-PDH pathway. In addition, 2 alternative routes to acquire CoA were identified. The first route includes maternal contribution of CoA and its precursors. The second route identified bacterially-mediated conversion of pantethine to a CoA intermediate by symbiotic microbiome species. These findings add to our knowledge regarding the pathophysiology of CoA biosynthesis-related diseases and shed light on potential cures or amelioration of disease symptoms.



● COVER BY QIAN WANG, TINGTING ZHENG, YI YU

Yi Yu (1991) studied Biological Sciences at the Northwest A&F University in China and did his Masters in Traditional Chinese Medicine at the Beijing Normal University, also in China. His doctoral research took place at the department of Biomedical Sciences of Cells and Systems of the University Medical Center Groningen and the University of Groningen. He will continue his academic career by doing postdoctoral research at the Max Planck Institute for Infection Biology. Yi Yu defended his thesis on September 1, 2021.

Photoperiodism in voles: A neurobiological perspective on seasonal ecology

PHD STUDENT
L. van Rosmalen
THESIS
Photoperiodism in voles: A neurobiological perspective on seasonal ecology
PROMOTORS
Prof.dr. R.A. Hut
Prof.dr. D. Hazlerigg
COPROMOTOR
Dr. L.P.W.G.M. Jacobus Mgn Van de Zande
FACULTY
Science and Engineering

Laura van Rosmalen has defined a mechanistic hierarchy for the integration of metabolic and photoperiodic cues in the mammalian reproductive system, which will be important for a better understanding of how environmental cues impact reproduction and ecological balances in the food web, in a changing climate.

Van Rosmalen: 'Many organisms use photoperiod as a proxy to time seasonal rhythms in reproduction. Metabolic effects on the reproductive axis also affect fertility. In this thesis I investigated the interaction between proximate energetic and predictive photoperiodic cues in voles, a herbivorous key species in many ecosystems. The documented variation in breeding strategy of voles is exploited for studying the interactions of environmental variables. I measured neuroendocrine and physiological responses of Northern tundra voles (Microtus oeconomus) and Southern common voles (Microtus arvalis) to photoperiod in relation to maternal photoperiod, temperature and food scarcity. We demonstrated that maternal photoperiod- and temperature-dependent modulation of photoperiodic responses manifest in the thyrotrophin-sensitive tanycytes of the medio-basal hypothalamus. By implementing the 'work-for-food' paradigm we were able to induce a negative energy balance and interestingly, voles responded by shifting from nocturnal circadian activity patterns to ultradian activity patterns. In addition, food-dependent modulation of photoperiodic responses manifest in the

melatonin-sensitive pars tuberalis and hypothalamus. These effects resulted in delayed reproductive organ development in spring-programmed voles when temperatures were high or when food was scarce. Furthermore, we found that the Tsh-receptor, which plays a pivotal role in the sensitivity to photoperiod, was targeted by natural selection, resulting in optimized timing of seasonal reproduction.'

Laura van Rosmalen (1991) defended her thesis on September 10, 2021

Ambitionz az a ridah: 2Pac's changing accent and flow in light of regional variation in African-American English speech and hip-hop music

PHD STUDENT
S.R.K. Gilbers
THESIS
Ambitionz az a ridah: 2Pac's changing accent and flow in light of regional variation in African-American English speech and hip-hop music
PROMOTORS
Prof.dr. W.M. Lowie
Prof.dr. C.L.J. de Bot
FACULTY
Arts

In hip-hop culture, representing where you are from is important. Two means of doing so are speech (using regional accents) and music (using regionally marked rap styles: 'flows'). This interdisciplinary PhD project found that for African-American English (AAE; hip-hop's primary language variety in the US), the West Coast and East Coast accents are distinct. West Coast AAE has longer vowels, greater melodic variation, and greater rhythmic variation than East Coast AAE, and listeners can differentiate between the varieties. Similarly, West Coast rap flows exhibit more melodic and rhythmic variation, suggesting a strong link between language and music in an AAE/hip-hop context.
So what would happen to the speech and rap of a prominent rapper if they moved to another region, switching regional allegiances? To answer this question, the late rapper 2Pac's speech and rap were investigated. 2Pac was originally from the East Coast, but later moved to California, where he would become West Coast hip-hop's leader in a conflict with the East Coast scene. The results show 2Pac's speech and rap became more West Coast-like over time, with the rate of this development towards West Coast norms increasing once he turned his back on his native East Coast. He also regularly 'overshot' the target during this time, sounding more West Coast-like than his Californian peers. These observations suggest 2Pac consciously manipulated his speech and rapping to sound like a West Coaster when his changed regional identity demanded it, showing that second (linguistic/musical) dialect acquisition involves both passive and active processes.

Steven Gilbers (1991) defended his thesis on September 13, 2021.

Monitoring the function of the P-glycoprotein transporter at the blood brain barrier

PHD STUDENT
L. Garcia Varela
THESIS
Monitoring the function of the P-glycoprotein transporter at the blood brain barrier
PROMOTOR
Prof.dr. P.H. Elsinga
COPROMOTOR
Dr. G. Luurtsema
FACULTY
Medical Sciences

The P-glycoprotein (P-gp) transporter located at the blood-brain barrier (BBB) is an efflux transporter that pumps neurotoxic compounds out of the brain. Its main function is to protect the brain to ensure an appropriate neural function. Decreases in the P-gp function can result in increased accumulation of toxic compounds inside the brain such as beta-amyloid and this may cause the development of Alzheimer´s or other neurological disorders. By contrast, increases in the P-gp function can decrease the therapeutic drug concentration inside the brain and influence the efficacy of the treatment



PHOTO BY ANA GARCÍA VARELA

(drug resistance) as occurred in patients with intractable epilepsy. Thus, it is of interest to monitor the P-gp function in vivo to facilitate the early diagnosis of brain disorders and to monitor drug resistance. To this aim, we used Positron Emission Tomography (PET) imaging, a non-invasive technique that allows the quantification of biological processes in vivo, and the novel radiotracer [18F] MC225 which measures the P-gp function. The aim was to study the kinetic properties of the radiotracer in different species and prove its efficacy to measure increases and decreases in the P-gp function before its clinical evaluation. We conclude that the obtained results have broadened the knowledge of the P-gp function at the BBB. Moreover, the results highlight that [18F]MC225 may become the first radiofluorinated P-gp PET tracer able to measure both decreases and increases in the P-gp function in vivo. The radiolabeling with fluorine-18 would allow its distribution to other PET centers and improve the image quality.

Lara Garcia Varela (1992) studied Pharmacy at the University of Santiago de Compestela (Galicia, Spain). In 2016 she had the possibility to do a short research internship via the Abel Tasman Talent Program at the department of Nuclear Medicine and Molecular Imaging at the University Medical Center Groningen. Afterwards she was accepted as a PhD student by the Abel Tasman Talent Program and in March 2017 she started her doctoral research at this department. After her thesis defense she will start working as a postdoctoral research at the Clinical Neurosciences Research Laboratory of the Health Research Institute of Santiago de Compostela under supervision of Dr. Tomás Sobrino en Dr. Pablo Aguiar.
Lara defended her thesis on September 13, 2021.

Anosognosia of memory deficits in dementia: biomarkers, connectivity, and clinical aspects

PHD STUDENT
J.D. Mondragon Uribe
THESIS
Anosognosia of memory deficits in dementia: biomarkers, connectivity, and clinical aspects
PROMOTORS
Prof.dr. P.P. De Deyn
Prof.dr.ir. N.M. Maurits
FACULTY
Medical Sciences



PHOTO BY SEBASTIAN BALART SANCHEZ

This Ph.D. thesis titled, Anosognosia of memory deficits in dementia: biomarkers, connectivity, and clinical aspects, is an effort to shed light on a neuropsychiatric phenomenon that has both academic research implications, as well as clinical practice implications. Anosognosia or unawareness of memory deficits is the main topic of this Ph.D. thesis which explores the implications of this neuropsychiatric phenomenon with neuroimaging measures, specifically functional brain connectivity, as well as clinical neurology and biomarker analysis. First, the current research definitions associated with the Alzheimer's disease (AD) continuum (i.e., the National Institute on Aging and Alzheimer's Association 2018 AT(N) research framework classification) are put into context, followed by an introduction of brain connectivity as a biomarker of AD progression and the neural correlates of anosognosia reported in the literature as obtained from different neuroimaging techniques. After introducing the biological and neuroimaging implications of anosognosia in the AD continuum, the neural correlates of anosognosia based on the AT(N) classification are reported using data from the Alzheimer's Disease Neuroimaging Initiative (ADNI) cohort. Finally, this thesis touches upon the clinical implications of anosognosia in end-of-life decision-making.

Jaime Mondragon Uribe (1983) defended his thesis on September 15, 2021.

Can hormones get you down?: Studies on sex steroids and depression

PHD STUDENT
A.E. de Wit
THESIS
Can hormones get you down?: Studies on sex steroids and depression
PROMOTOR
Prof.dr. R.A. Schoevers
COPROMOTORS
Dr. M.K. de Boer
Dr. E.J. Giltay
FACULTY
Medical Sciences

Depression affects about 12% of men and 25% of women at some time in their life. Because of this difference, sex steroids are thought to have an effect on mood. In order to more precisely specify the relationship between sex steroids and depression, Anouk de Wit focused on two questions in her thesis: 1) how are sex steroids associated with depression? 2) do hormonal contraceptives cause depression? She also explored how researchers could contribute to improving science journalism, after she had personally experienced how certain research findings were misinterpreted by some of the media. For the first question, de Wit analyzed the data from large Dutch and American cohort studies on depression that collected state-of-the-art sex steroid measurements in men and women. The results showed that single measures of sex steroids were not predictive of depression or suicidality in adult men and women. In contrast, studies in which sex hormones had been determined several times in women during the menopause transition, did find links between the variability in sex hormones and mood problems. For the second question, she examined the data on hormonal contraceptive use and depression from women from a large cohort study, and from thousands of women that participated in randomized clinical trials. She found evidence showing that hormonal contraceptives do not cause depressive symptoms in adult women, but that use coincides with a deterioration of depressive symptoms in young women. Finally, based on her experiences, she argued that researchers should critically check press releases for exaggerated claims to prevent incorrect dissemination of research findings by the media. In short, this thesis clearly shows that sex steroids can play multiple and diverse roles in depression. Future studies should measure sex steroid levels serially in order to capture the complex hormonal dynamics

that potentially play a role in depression. Furthermore, randomized clinical trials are needed to confirm or reject the hypothesis that hormonal contraceptive use causes depression in young women.

Anouk de Wit (1993) studied Medicine at the University of Groningen. She did her doctoral research at the department of Psychiatry of the institute BRAIN and Cognition of the University Medical Center Groningen. Meanwhile she is working as ANIOS Neurosurgery at the Haaglanden Medical Center Westeinde. She defended her thesis on September 22, 2021.



PHOTO BY JULIAN DU PERON

Brain network signatures of depressive symptoms

PHD STUDENT
S. Alonso Martinez
THESIS
Brain network signatures of depressive symptoms
PROMOTOR
Prof.dr. G.J. ter Horst
COPROMOTORS
Dr. R.J. Renken
Dr. J.B.C. Marsman
FACULTY
Medical Sciences

Depressive symptoms are common in the general population. Even in individuals who do not meet the criteria for a Major Depression Disorder (MDD), their symptoms are of clinical relevance because they increase the likelihood of progressing into a full-blown depressive episode, which in turn increases the prevalence of future episodes. The studies in this thesis apply advanced computational methods to functional magnetic resonance imaging (fMRI) data to investigate the dynamics of network connectivity, with the aim of understanding what brain mechanisms make a person more vulnerable to depression. Our results suggest that imbalances in whole-brain connectivity can already be linked to higher levels of depressive symptoms in healthy (undiagnosed) individuals. These imbalances correspond to a reduced dynamism in the overall functional organization of the brain, suggesting a link between a 'rigid brain' and rigid behavior, such as the lack of flexibility in cognitive and emotional responses that often accompany depressive symptoms. Additionally, individual differences in the repertoire of brain states indicate that people with more depressive symptoms engage more in states related to self-referential thinking. This tendency was also observed in remitted patients during the transition into a depressive episode. This emphasizes that the present experience of depressive symptoms, whether in healthy individuals or MDD patients, is associated with changes in brain communication. The findings of this thesis lead to a deeper understanding of the complex orchestration of brain communication and its changes concerning depressive symptomatology in clinical and non-clinical populations.

Sonsoles Alonso Martinez (1987) studied Psychology at the Autonome University of Madrid and the University of Santiago de Compostella, Spain, and she did her

master in Brain Sciences at the University of Glasgow, United Kingdom. She did her doctoral research at the Cognitive Neuroscience Center of the University Medical Center Groningen. She defended her thesis on September 22, 2021.

From voice to speech: The perception of voice characteristics and speech in children with cochlear implants

PHD STUDENT
L.L.A.M.G. Nagels
THESIS
From voice to speech: The perception of voice characteristics and speech in children with cochlear implants
PROMOTORS
Prof.dr. P. Hendriks
Prof.dr.ir. D. Baskent
FACULTY
Arts

Cochlear implants (CIs) are auditory prostheses for deaf individuals. The CI speech signal is degraded compared to normal acoustic hearing. This causes difficulties with the perception of speech and voice characteristics, such as emotions, pitch, or vocal-tract length, related to speakers' height. Speakers' mean pitch and vocal-tract length together lead to perceived differences between male and female voices. Voice characteristics help listeners to focus on one speaker to perceive speech while multiple people talk at the same time. The consequences of the degraded CI speech signal on the development of voice and speech perception in CI children and how this development differs from normal-hearing children are unclear. This dissertation investigated how the perception of differences in speakers' pitch, vocal-tract length, and emotions , as well as the perception of speech in background speech, develops in normal-hearing and CI children. My research shows that there is a strong development in the perception of speech in background speech and differences in voice characteristics in normal-hearing children, as well as CI children during the school-age years and beyond. This development does not only seem to relate to CI children's hearing abilities, but also to their cognitive abilities that are not yet adult-like. Furthermore, CI children seem to make better use of the information provided by the degraded CI speech signal than CI adults. This could be caused by differences in brain plasticity and early exposure to the CI signal. Thus, better cognitive abilities lead to better voice and speech perception in both normal-hearing and CI children.

Leanne Nagels (1993) defended her thesis on September 23, 2021.

Understanding hallucinations outside the context of psychotic disorders: An epidemiological, phenomenological and pathophysiological perspective

PHD STUDENT
M.M.J. Linszen
THESIS
Understanding hallucinations outside the context of psychotic disorders: An epidemiological, phenomenological and pathophysiological perspective
PROMOTORS
Prof.dr. I.E.C. Sommer
Prof.dr. P. Scheltens
COPROMOTOR
Dr. R.M. Brouwer
FACULTY
Medical Sciences

Hallucinations have traditionally been studied in the context of psychotic disorders, such as schizophrenia. However, they occur in many different diseases, and even in the general population. The research in this thesis aims at improving understanding of hallucinations in hearing impairment, Alzheimer's disease and the general population.
One of the main findings of this thesis is the association between hearing impairment and auditory hallucinations. The worse the impairment, the higher the percentage of people with recent auditory hallucinations. People may hear music, voices, or the doorbell. In some cases, people experience a lot of distress from their hallucinations. Furthermore, it appears that hallucinations are not common in people with early-stage Alzheimer's disease. If hallucinations do occur, other diseases in which hallucinations can occur should also be considered, such as hearing impairment or dementia with Lewy Bodies. The third part of this thesis provides an overview of the very diverse manifestations with which hallucinations can present themselves in the general population. Also, participants from the general population who have recently heard voices appear to make more mistakes on a language perception task.
With the information from this thesis, physicians can improve education and

diagnostic assessment of hallucinations. Our findings also provide clues about underlying mechanisms of hallucinations. Finally, our findings are also relevant for the general public. Often, hallucinations are still accompanied by stigma, or the fear of being thought crazy. This thesis shows a much more nuanced perspective of hallucinations.

Mascha Linszen (1988) studied Medicine at the University of Utrecht. She did her doctoral research at the department of Psychiatry of the University Medical Center Utrecht, the Alzheimer Center of the Amsterdam UMC and the University of Groningen. As of 2019 she works as a doctor in training in psychiatry at the University Center for Psychiatry in Groningen, where she will continue her work after her thesis defense.
Mascha defended her thesis on September 27, 2021.

Keeping track of emotions: Audiovisual integration for emotion recognition and compensation for sensory degradations captured by perceptual strategies

PHD STUDENT
M.J. de Boer
THESIS
Keeping track of emotions: Audiovisual integration for emotion recognition and compensation for sensory degradations captured by perceptual strategies
PROMOTORS
Prof.dr. F.W. Cornelissen
Prof.dr.ir. D. Baskent
FACULTY
Medical Sciences

The majority of emotional expressions are multimodal and dynamic in nature. Emotion recognition, therefore, requires integration of these multimodal signals. Sensory impairments likely affect emotion recognition. However, although sensory impairments are common in older adults, it is unknown how they affect emotion recognition. As more people reach old age, accompanied by an increase in the prevalence of sensory impairments, it is urgent to comprehensively understand audiovisual integration, especially in older individuals. My thesis sought to create a basic understanding of audiovisual integration for emotion recognition and study how audiovisual interactions change with simulated sensory impairments. A secondary aim was to understand how age affects these outcomes. To systematically address these aims, I examined how well observers recognize emotions, presented via videos, and how emotion recognition accuracy and perceptual strategies, assessed via eye-tracking, vary under



PHOTO BY FOKKE DE BOER

changing availability and reliability of the visual and auditory information. The research presented in my thesis shows that audiovisual integration and compensation abilities remain intact with age, despite a general decline in recognition accuracy. Compensation for degraded audio is possible by relying more on visual signals, but not vice versa.

Older observers adapt their perceptual strategies in a different, perhaps less efficient, manner than younger observers. Importantly, I demonstrate that it is crucial to use additional measurements besides recognition accuracy in order to understand audiovisual integration mechanisms. Measurements such as eye-tracking allow one to examine whether the reliance on visual and auditory signals alters with age and (simulated) sensory impairments, even when lacking a change in accuracy.

Minke de Boer (1992) studied Behavioural Sciences at the University of Groningen. She did her doctoral research at the department Otolaryngology of the institute BRAIN and Cognition of the University Medical Center Groningen. She now works as a postdoctoral researcher at the UMCG. She defended her thesis on October 13, 2021.

Advancing the age of cycling

PHD STUDENT
F. Westerhuis
THESIS
Advancing the age of cycling
PROMOTORS
Prof.dr. D. de Waard
Prof.dr. K.A. Brookhuis
COPROMOTOR
Dr. A.B.M. Fuermaier
FACULTY
Behavioural and Social Sciences

In the Netherlands, the number of older cyclists is increasing. This is desirable because cycling supports healthy ageing and personal independence. Older cyclists, however, run relatively large risks on (single) bicycle crashes. The goal of this thesis is to explore which parts of the infrastructure and (on-road) interactions lead to problems for older cyclists and, thereafter, to test the effectiveness of infrastructural and on-bicycle interventions on safety. 'Everyday cycling' observations of older cyclists revealed that obstacles, irregular surfaces, sharp corners, slopes, and narrow paths may cause difficulties. Some cyclists were also observed to (unintentionally) ride into the verge. Predicting the behaviour of other cyclists was also found to be difficult. At



PHOTO BY DICK DE WAARD

different locations, the effects of virtual 3D-objects, edge lines, slanted curbstones, shoulder strips, and edge strips on cycling behaviour of older cyclists were measured. With small GPS action-cameras mounted on older participant's bicycles, on-site experiments revealed that shoulder strips and edge strips were the most beneficial interventions for safety: on cycle paths with these modifications, participants rode further away from the soft verge compared to other (control) paths. They also cycled slower on the cycle paths with shoulder strips. Lastly, effects of using bicycle lights to communicate speed, braking, and turning intentions to other road users were investigated. The results showed that the tested speed signal was not effective. The turning indicator and brake light, however, seem useful for older cyclists.

Frank Westerhuis (1988) defended his thesis on October 14, 2021.

Cortical synchrony across cognitive processing stages: dynamics & coordinating mechanisms

PHD STUDENT
O. Portoles Marin
THESIS
Cortical synchrony across cognitive processing stages: dynamics & coordinating mechanisms
PROMOTOR
Prof.dr.ir. M. Cao
COPROMOTORS
Dr. M.K. van Vugt
Dr. J.P. Borst
FACULTY
Science and Engineering

Any cognitive task requires the execution of a set of elementary cognitive processes. These cognitive process are assumed to require coordination between specific regions of the brain. However, the patterns of neural coordination related to each cognitive process were never measured due to some technical limitations. In this thesis we overcame these limitations and measured the patterns of neural coordination at each elementary processing stage in a memory task. Indeed, our results show that a new pattern of neural coordination emerges at the onset of each processing stage. Furthermore, we investigated the mechanisms that cause these switches between patterns of neural coordination. To this end, we developed the first whole-brain model that can simulate large-scale neural coordination throughout a cognitive task. First we showed that this model is able to simulate the dynamics of neural coordination during resting state. Next we showed that short pulses of neural activity targeted at specific brain regions cause the switching between states of neural coordination associated with elementary cognitive processes.

Oscar Portoles Marin (1985) did his doctoral research at the department Artificial Intelligence of the Bernoulli Institute (University of Groningen). He now works as Scientific software developer at the Forschungszentrum Jülich (Germany). He defended his thesis on October 15, 2021.

The role of the placenta in transmitting disturbed serotonin levels from the maternal environment: a comparative study with live-bearing fish, rats and humans

PHD STUDENT
L. Staal
THESIS
The role of the placenta in transmitting disturbed serotonin levels from the maternal environment: a comparative study with live-bearing fish, rats and humans
PROMOTORS
Prof.dr. J.D.A. Olivier
Prof.dr. B. Wertheim
COPROMOTORS
Prof.dr. T. Plosch
Dr. B.J.A. Pollux
FACULTY
Science and Engineering

The use of antidepressants during pregnancy may have negative consequences for the developing offspring. The antidepressant fluoxetine enhances extracellular serotonin concentrations. A disturbance in these serotonin concentrations during development may contribute to the adverse effects found in the offspring. The placenta plays an important role in providing nutrients and protecting the fetus from toxic substances. In this thesis the role of the placenta in transmitting these adverse effects has been studied. First, the influence of fluoxetine on the placental transcriptome (the expression patterns of all genes) was studied. Both human placentas and the placentas of rats treated with fluoxetine during pregnancy were used. In the human study, a large number of genes were found to be differentially expressed in the placentas of women who had taken fluoxetine and who were pregnant with a boy. In the placentas of rats, the number of differentially expressed genes was smaller. Therefore, it seems likely that maternal depression influences the fluoxetine-induced changes in the placenta. To further investigate the role of the placenta in transmitting fluoxetine effects to the offspring, two closely related fish species, one with and one without a placenta, were compared. Fluoxetine treatment during pregnancy resulted in stronger adverse effects in offspring with the placenta than without the placenta.

In conclusion, the results of the research of Laura Staal imply that the placenta plays an important role in the effects of fluoxetine on the offspring.

Laura Staal (1991) defended her thesis on October 22, 2021.

Ataxia and dystonia: from individual genes to networks and disease mechanisms

PHD STUDENT
M. Huang
THESIS
Ataxia and dystonia: from individual genes to networks and disease mechanisms
PROMOTORS
Dr. D.S. Verbeek
Prof.dr. M.A.J. de Koning-Tijssen
FACULTY
Medical Sciences

Spinocerebellar ataxia (SCA) and dystonia (DYT) are rare genetic movement disorders caused by alteration in a specific gene inherited from one or both parents. SCA patients suffer from a lack of coordination and slurred speech, whereas



DYT patients experience involuntary muscle contractions. SCA symptoms are caused by a loss of nerve cells called Purkinje cells in the cerebellum. In contrast, the underlying brain damage causing DYT seems to involve multiple brain regions. While we now know of more than 60 genes that are affected in SCA and DYT, approximately 30% of patients remain genetically undiagnosed and disease mechanisms remain largely unknown. Consequently, there is no cure for SCA or DYT.

In this thesis, we used next-generation sequencing, bioinformatic analysis and functional studies to identify novel disease genes for DYT and modifier genes for SCA, as well as disease mechanisms. We identify likely novel disease genes for the task-specific focal DYT Writer's cramp and adult-onset cervical DYT with bilateral upper limb tremor and a novel genetic modifier for age of onset in SCA3/ Machado-Joseph disease. By moving from individual genes to gene networks, we expose the vulnerability of Purkinje cells to genetic insults and SCA. Through cross-disease analysis of ataxia, DYT and depression, we expose a key role for the cerebellum in mood processing in addition to regulation of motor function.
Our work improves the genetic diagnostics of patients with SCA or DYT and provides novel insights into underlying disease mechanisms that may open doors for the development of therapeutic interventions.

Miaozhen Huang (1992) studied Genomics and Bio-informatics at the Chinese University of Hongkong. She did her doctoral research at the Genetics department of the institute BRAIN and Cognition of the University Medical Center Groningen. She now works as a postdoctoral researcher at the Tsinghua University in Beijing, China. She defended her thesis on October 25, 2021.

Connections between social stress, immune dysregulation and psychosis: A virtual reality study

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THESIS
Connections between social stress, immune dysregulation and psychosis: A virtual reality study
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FACULTY
Medical Sciences

Childhood trauma, ethnic minority position or growing up in an urban environment increase the risk for psychosis. The social environment, combined with genetic susceptibility, is important in the development of psychosis. We examined if an altered reaction to social stress is involved. We used a virtual reality (VR) environment, a VR café. The VR café was quiet or crowded. Virtual humans had similar or different skin colour compared to the participants and reacted in a friendly or hostile way. Participants felt more stressed and paranoid and their physiological stress levels increased in reaction to VR stressors. This reaction

was similar for persons with and without a psychosis. However, as psychosis patients were more stressed to begin with, their stress levels ended up higher. In contrast, participants with a history of childhood trauma reacted stronger to social stress. We also examined a possible role for immune dysregulation. Previous studies found altered immune markers in psychosis patients and after childhood trauma. We did not find altered immune markers in our study. Immune dysregulation may occur mainly in combination with obesity. Obesity is more common in psychosis patients. However, the psychosis patients in our sample had an healthy weight on average. Our results highlight that childhood trauma and life style warrant attention in psychosis patients.

Jacqueline Counotte (1985) studied Biomedical Sciences, Psychology and Medicine at the University of Leiden. Her doctoral research was a collaboration between Parnassia in The Hague, the ErasmusMC and the Psychiatry department of the University Medical Center Groningen. Meanwhile she works as a psychiatrist at practice Willemspark in The Hague. She defended her thesis on October 25, 2021.

Home-based behavioral parent training for children with ADHD: A follow-up treatment for non-responders to routine clinical treatment?

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THESIS
Home-based behavioral parent training for children with ADHD: A follow-up treatment for non-responders to routine clinical treatment?
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Ellen Nobel describes in her thesis a randomized controlled trial investigating the effectiveness of a manualized home-based treatment (Behavioral Parent Training Groningen @HOME [BPTG@HOME]) for children with ADHD. The treatment was offered when children responded insufficiently to the evidence-based treatments medication (such as methylphenidate) and outpatient parent training. The study included 73 school-aged children with ADHD. They were assigned to one of three groups: a group that received short BPTG@HOME, a group that was on a four-month waiting list for home-based treatment, and a group that received a long, eclectic, homebased treatment that is common to give in clinical practice.

The study showed that BPTG@HOME is a better alternative to not providing treatment and the longer home-based treatment. Compared to the other groups, children in the BPTG@HOME group had – after treatment – significantly fewer behavioral problems and parents used less harsh and inconsistent discipline. It also became clear that in a home-based treatment it is not only important that parents learn to use less harsh discipline, but also obtain an increased feeling of parental competence, and experience less stress while managing the behavioral problems of their child. BPTG@HOME also led to positive effects on these variables, compared to the waiting list group. Finally, six months after treatment parents in the BPTG@HOME group experienced the behavioral problems of their child as less problematic than other parents. In short, BPTG@HOME is an effective and efficient follow-up treatment for children with ADHD who did not respond sufficiently to other treatments.

Ellen Nobel (1983) defended her thesis on October 27, 2021.

Looking at possibilities: research into assessment of people with profound intellectual and multiple disabilities

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Looking at possibilities: research into assessment of people with profound intellectual and multiple disabilities
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Through assessment, an overview of the needs, wishes and abilities of people with profound intellectual and multiple disabilities (PIMD) can be obtained, which can then be used to attune support to the individual. This study focused on an inventory of assessment practices for this group, using an online survey for professionals who work with people with PIMD. Next, a literature search was



PHOTO BY JENNE HOEKSTRA

performed to find information about the quality of the assessment methods used by professionals. In addition, this study aimed to analyse the measurement quality of two instruments that have been developed for people with PIMD: the Behavioural Appraisal Scales (BAS) and the Inventory of the personal Profile and Support (IPS). To this end, the BAS scores of children and adults with PIMD were analysed. Furthermore, an expert panel assessed whether adaptations of the BAS were necessary and, if so, which ones. For the IPS analysis, the professionals filled in a questionnaire about the feasibility and content validity of the IPS.

From this study, it could be concluded that a wide range of different instruments are used, but little is often known about their measurement quality. Besides, instruments that have been studied and deemed to be good quality are not always used in practice. Another conclusion was that using a combination of the IPS and BAS led to an adequate representation of the wishes, needs and abilities of a person with PIMD. After adaptations, the applicability and measurement quality of the BAS was assessed as good. With this instrument, the functional abilities of people with PIMD can be assessed in order to support development.

Marleen Wessels (1991) defended her thesis on October 28, 2021.

Effects of laboratory housing conditions on neurobiology of energy balance in mice

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THESIS
Effects of laboratory housing conditions on neurobiology of energy balance in mice
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Science and Engineering

Karapetsas: 'Preclinical research using animals plays a vital role in understanding the regulation of body weight, appetite and energy balance. Laboratory housing conditions can greatly affect experimental outcomes, however, these factors are often overlooked. Indeed, rodents raised in small litters are more prone to develop obesity and metabolic derangements than rodents raised in normal litters. In addition, housing mice either individually or socially from weaning until adulthood can greatly reduce growth and affect energy balance regulation, and metabolic health, but in a sex-dependent fashion. It has been hypothesized that the lack of social thermoregulation may be partly responsible for these effects. However, increasing environmental temperature close to thermoneutrality (28°C) does not ameliorate these effects. This emphasizse that laboratory housing conditions, the number of mice in a cage and their sex must be reported, as they can profoundly affect experimental outcomes in preclinical studies. The establishment of socially dominant relationships can also potentially affect energy balance regulation in mice in a sex-dependent fashion, although this has been studied only in an exploratory analysis and conclusions cannot be drawn. Finally, in ingestive behviour studies in mice, meals are often defined using arbitrary criteria, but the effects that these can have on meal related parameters are not known. Investigation of feeding behaviour and meal-related parameters in mice is possible through automated breakpoint analysis and the use of arbitrary intermeal intervals to define meals should be carefully evaluated.'

Giorgio Karapetsas (1987) defended his thesis on October 29, 2021.

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

CHEEKY PROPOSITIONS

Open Science is the present and future of science.

Jaime Mondragon Uribe

General notions are generally wrong.
(Lady Mary Wortley Montagu, letter to her husband Edward Wortley Montagu, March 28, 1710)

Anouk de Wit

Studenten: Onder ons gezegd, we kunnen het ook wel in twee jaar.
[Students: Among us, we can also do it in two years]
(Loesje - October 1, 1994)

Anouk de Wit

A straight line may be the shortest distance between two points, but it is by no means the most interesting.
(3rd Doctor)

Minke de Boer

The older the cyclist, the younger the bicycle.

Frank Westerhuis

Meten is niet altijd weten, maar niet goed meten is foutief weten.
[To measure is not always to know, but to measure incorrectly is to know incorrectly]

Marleen Wessels

三人行，必有我师焉。择其善者而从之，其不善者而改之。”《论语·述而》——孔子。
[When three men meet together, the one who is anxious to learn can always learn something of the other two. He can profit by the good example of the one and avoid the bad example of the other.]
(Translated by Gu hongming (1857-1928)). The Analects, Confucius (551–479 BC, philosopher and educator)

Yu Yi

It was the best of times, it was the worst of times.
Charles Dickens, A Tale of Two Cities (1812-1870)

Miaozhen Huang

COLOPHON

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ERRATUM
The photocredits on page 39 of Newsletter 123, were incorrect. The portrait of Aida Salčić was actually made by Miguel Santin Schulz.

COVER PHOTOS
Sander Martens, www.sandermartens.com

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