



A summer state of mind



university of
groningen

IN THIS ISSUE

From the board room: Looking Back, Moving Forward **3**

Interview: Robbert Havekes, director of the BCN Research Master **5**

Iris, In Focus: A Career in Science: One Rejection and Disappointment After Another **10**

BCN PHD Council News **12**

Interview: Fitness to drive, social cognition and young-onset dementia **13**

Grand stuff **18**

Science on Wednesday **19**

REMA column: A Semester in Sydney **20**

BCN PhD Council News: The BCN Summer Symposium **22**

Cheeky propositions **26**

Inaugural Lectures **27**

Mindwise: On brain transformation during perimenopause **28**

BCN Thesis defenses **32**

New staff writers wanted! **46**

Colophon **47**

FROM THE BOARD ROOM



Looking Back, Moving Forward

Next year marks 40 years since I arrived in Groningen as a student to study Dutch Language and Literature. It also marks 40 years since the launch of the Research School for Behavioural and Cognitive Neurosciences (BCN). During my early years as a student, I had little idea of what was happening in the field of research. However, once I attended my first research seminars on language disorders, I began to grasp the concept of multidisciplinary. I eventually graduated with a degree in Dutch, but with minors in Neurology, Neuropsychology, and Statistics.

My introduction to BCN followed soon after my studies; I secured a PhD position that fell under the research school. This coincided with a time when BCN was considering how PhD candidates could contribute to its governance, and when the first BCN PhD council was established in 1995, I became its first chair. Beyond the policy-related contributions we could make—such as setting up a job application training course, which later helped me land a job at NWO—I thoroughly enjoyed serving on a council with PhD candidates from such diverse disciplines as neuroanatomy, biophysics, and experimental psychology. That multidisciplinary continued to appeal to me in the subsequent activities I have undertaken—and still undertake—for BCN, whether serving on the BCN dissertation prize committee, teaching management courses for BCN PhD candidates, or, for the past few years now, serving on the BCN board. I see immense added value in collaboration between groups in the field of neuroscience with their own distinct specializations.

In a world where university research structures often shift rapidly.

In a world where university research structures often shift rapidly—with the focus sometimes shifting between local and national collaboration, between graduate schools and research schools, or seeing schools adopt a different, more general approach—BCN has consistently charted its own course for nearly 40 years. While 2027 will be a year of celebrations, this is no time to rest on our laurels; we must remain committed to ensuring the school retains the position it holds and deserves. BCN's educational program (comprising the Research Master and PhD tracks) continues to be highly successful and well-regarded—a fact acknowledged by the assessment committee that reviewed BCN two years ago. However, new initiatives are required regarding communication and structural support, as well as in engaging the BCN community to participate in activities and identifying their specific needs. Since the start of this year, the Board has been working according to a clear

annual plan, identifying specific goals and establishing a concrete timeline for their realization. We will keep the BCN community informed of these activities through various channels, though we can already highlight a few, such as the establishment of a postdoc committee and a research advisory committee. The latter comprises the directors of the research institutes participating in BCN (or their designated representatives who are also active within BCN). This committee will provide solicited and unsolicited advice to the BCN Director and Board regarding policy—covering topics such as symposia, collaboration (within the school, the university, and beyond), increasing PI participation, and funding opportunities. Discussions regarding a budget increase are still ongoing; one small step in this direction is the possibility of structuring our seed funding program to align with faculty-level programs, thereby expanding funding opportunities.

However, alongside the plans we are developing at the Board level, BCN members undoubtedly have ideas of their own. No matter how undeveloped these might be, please share them with your local research director or RAC member, or pass them on to one of the board members. We will be announcing more details about our 40th-anniversary celebration this autumn, but the same applies here: if you have ideas for an activity that would suit this celebration, please let us know so we can include it in our program.

BCN has consistently charted its own course for nearly 40 years.

On behalf of the board, I would like to wish all BCN members a wonderful summer!

- BY ROEL JONKERS
- PHOTO BY RONNIE ZEEMERIG

INTERVIEW



Robbert Havekes, director of the BCN Research Master

Penny Heisterkamp: *Thank you for agreeing to this interview. You have been the director of the BCN Research Master for four years now. What made you originally decide to take on this role?*

Robbert Havekes: Indeed, it has been four years; time flies when you are enjoying what you do. I was always amazed by the high quality of the educational programme, the great students it attracts, and the community feeling within the BCN Research Master and BCN Research School. I was slightly intimidated before accepting the position because of the interfaculty nature of the programme, and spread across the city with the three tracks based at different locations (i.e., Zernike, Heymans, UMCG). That being said, I am very glad I accepted the position because the community as a whole is so amazing and supportive, and it has also allowed me to get to know people from different faculties, some of whom I now consider friends.

PH: *What are your day-to-day activities as programme director?*

RH: The day-to-day activities vary from week to week and throughout the year and include meetings with the BCN ReMa support team, other programme directors in the Programme Board cluster Biology, and brief discussions with Track Mentors and fellow teachers, as well as the various committees. These meetings are important to monitor and adjust the academic plans throughout the academic year. Most of these aspects generally repeat on a yearly basis.

In the last half year, however, a lot of my time has been put into preparing for the three-year formal audit of the ReMa, which included writing a detailed report on various aspects of the programme. The audit went smoothly as the programme is in really good shape both in terms of quality and student numbers. Rob Timmermans, the Vice-Dean of FSE was also very pleased and agreed that we are doing exceptionally well and are in good shape towards the re-accreditation audit that will take place in 2029.

In addition, I have focused a lot on the first steps towards the implementation of the Smarter Academic Year (SAY) in our programme. This required a series of meetings with the mentors and course coordinators to restructure the curriculum, map the programme in detail, and identify potential bottlenecks. In our case, this has been an even bigger challenge due to the interfaculty nature of the programme. That being said, everyone's willingness to contribute and constructively approach this major challenge underscored again to me how committed

everyone is to the programme and its students. I am absolutely sure that we can make it a success. For the next half year, most effort will go to the fine-grained details of the implementation of SAY, while we also maintain our promotional efforts to keep our student numbers where they are. Much of the work happens behind the scenes and not everything is always visible to students.

Finally, I always try to chat with students to see how they are doing in the programme and how things are going in the programme from their perspective. The latter I feel is really important as I believe that, just like the Mentors, it is important for a programme director to be very visible and easily approachable for students so that, when questions arise, they feel comfortable asking them and don't hesitate to approach us. In this way, I also try to contribute to the positive atmosphere in the programme.

PH: *Over the years, you have seen many master's students enter and graduate from the programme. What, in your view, characterises the typical student enrolled in the BCN master?*

RH: In my view, the typical student enrolling in the BCN Research Master is a highly motivated, committed, and enthusiastic student who also greatly values teamwork and a strong sense of community. I have often seen that BCN students have a high level of curiosity for science in general.



PH: It is clear that those BCN master's students are very enthusiastic about the programme: congratulations on the wonderful outcomes of the Dutch National Student Survey (NSE). A 4.5 out of 5 for student satisfaction with the BCN master: how did you react when you first heard the news?

RH: I was of course tremendously proud. When I started as the Director, close to four years ago, I gradually developed a vision on how to develop the programme further and improve the overall quality of the curriculum with input from Mentors, teachers, support staff, and importantly students. When we got the news, the first thing I did was of course share it with everyone involved in the programme including the students. In fact, I also highlighted the results once more during the Research Master Summer Symposium and underscored that our efforts as a community are really paying off.

PH: What do you think is unique about the BCN master's programme?

RH: What makes the programme unique in the Netherlands is the breadth of research fields and methodologies it encompasses. In that way, the BCN Research Master is unique among neuroscience master's programmes in the Netherlands and abroad. Importantly, this allows students to discover what they really like across these diverse fields of neuroscience and tailor the programme to their own interests. Some students may want to explore both the field of Molecular Neuroscience

and Cognitive Neuroscience (e.g., from molecular sequencing studies to more human-oriented research) and in this way get the best from both fields. Others may find their niche quickly and use the programme to really gain more experience in their areas of interest (for example, in the field of sleep research). Importantly, because the programme includes both a minor and major thesis, it really allows students to explore different options and opportunities, which ultimately helps them discover what area(s) of interest they may want to continue in as PhD students.

[...] this allows students to discover what they really like across these diverse fields of neuroscience and tailor the programme to their own interests.

PH: Another element that stands out in the NSE is the excellent atmosphere within the programme. What do you think makes this atmosphere so positive?

RH: Since I started as a Director, one of the key things we did was put more emphasis on the creation of a supportive learning environment that fosters both individual development and immersion in a highly collaborative and multidisciplinary research community. While the

programme has always had a pretty strong sense of community, we have now made it even more explicit that "if you help others, others will help you; everyone wins". Related to this, for a few years now, the second-year students by their own initiative have installed a buddy system where second-year students provide some mentoring/support for first-year students that would like to get some support/guidance. The support from second-year students has ranged from guidance on what aspects to put emphasis on while studying for a course, to helping fellow students finding furniture and buying a first bicycle. Likewise, the student council now annually organises introductory dinners with a mix of second-year/first year students at the start of the academic year and other events throughout the year in addition to the many social activities students from the individual tracks plan with each other. Such aspects really help students get connected and make friends, something that is particularly important also for those who have not done their bachelor in Groningen or elsewhere in the Netherlands. Students really feel part of the BCN community rather than passive participants and the examples and initiatives by students underscore this sense of belonging. The BCN Research School amplifies this sense of community further as it allows Master students to easily connect with PhD students and staff from the different fields. A positive development of this strong sense of community and positive/collaborative atmosphere is that it has also attracted many BSc students through word of mouth (i.e., there is something special going on in the Research Master that is great to be part of).

If you help others, others will help you; everyone wins.

PH: *Most people would assume that students who complete a research master end up pursuing an academic career. What do we know about the career steps that alumni of the BCN master's programme take after graduation?*

RH: Approximately 75-80% of the students follow an academic career. Others continue in varying fields ranging from policy advising, working in companies etc. While not everyone continues in science, it is the skills that were obtained as part of the BCN ReMa that can readily be applied in other fields of work. For example, having excellent communication and writing skills or identifying a challenge and developing a plan on addressing it is something that can be applied in many careers. Likewise, learning how to work effectively in a team is something essential for almost all jobs.

PH: *Of course, not only students move on to a new stage; the BCN master's programme also changes. What will be the next steps for the BCN master?*

RH: The next steps will be focused on implementing the SAY in the 2027-28 academic year, while maintaining and safeguarding the high programme quality. In addition, we

will focus on consolidating student numbers. In the last four years, the programme has grown by approximately 40% while overall programme appreciation also increased. Nevertheless, we will keep up the elevated levels of promotion to make sure we stay at the same level or slightly increase further. These promotional efforts are key and successful as we are going against the trend of the overall decreasing student numbers.

PH: *In addition to celebrating the outcomes of the NSE, what have been other highlights of your time as director?*

RH: There have been so many, but to name a few: I think that seeing the engagement and commitment of the students to give back to the programme and fellow students, and help strengthen the sense of community grow further over the years has been amazing. Another clear highlight is to see the individual growth of students across the two years as I get to know many of them throughout their time in the programme. In that respect the summer symposium is always a highlight of the academic year for me, and every year I am blown away by the high quality of research they have conducted as part of the minor/major thesis and how they developed into amazingly skilled presenters and junior scientists.



PH: *One of the aims of BCN is to create opportunities for interdisciplinary dialogue about neuroscience. You are a neurobiologist by training, specialised in learning and memory. Can you tell us one thing you have learned about neuroscience from a different discipline due to your experiences as director?*

RH: I really believe that an interdisciplinary research strategy, as taught in the BCN ReMa, is essential to tackle the key essential questions in (neuro)science. In that respect, I have started to examine more and more how we can translate our fundamental discoveries on the molecular basis of memory and reversing amnesia towards a human setting. Furthermore, we have, for example, also started to collaborate with bioinformaticians to elucidate what drives forgetfulness at a brain-wide circuit level. Not only do such collaborations allow us to address questions we could otherwise not address, it is also a great way to establish new collaborations and make new friends along the way.

[...] an interdisciplinary research strategy, as taught in the BCN ReMa, is essential to tackle the key essential questions in (neuro)science.



PH: *Finally: imagine you were a student starting the BCN master's programme in September. What courses would you not want to miss out on?*

● BY PENNY HEISTERKAMP
● PHOTOS BY ZHENYU ZHANG AND MERLIJN BROUWER

RH: Ah this is a very interesting question. I would probably hope to enrol in the Behavioural Neuroscience track of the programme and then aim to complement it with courses on cognitive modelling, such as the one Wouter Kruijne gives as part of the C-track programme, and more molecular- and pathology-oriented course such as the one that Bart Eggen and Wilfred den Dunnen coordinate. That would put me in the most ideal position to address the research questions my lab is currently interested in today.

IRIS. IN FOCUS



A Career in Science: One Rejection and Disappointment After Another

On June 26, the moment had finally arrived: the announcement of the Dutch Research Council (NWO) Spinoza and Stevin Prizes, the highest scientific distinctions in the Netherlands. This time, your faithful BCN columnist was fortunate to be one of the four laureates. I owe ever-lasting gratitude to the University Medical Center Groningen (UMCG) and the University of Groningen (RUG) for nominating me, and to NWO for selecting me.

You might now think that my career—and those of my fellow laureates Karin Roelofs, Hermen Overkleeft, and Claes de Vreese—has been one long string of successes. A straight road to Tipperary. If that is your thought, it's time to burst that bubble. We have certainly enjoyed our share of successes, but behind every success lies a fair collection of rejections, failures, and disappointments. Not just for us, but for scientists in general, the ratio of success:bummer is roughly 1:4-5.

I am not writing this to complain, as I have no reason to complain today, but to encourage my fellow researchers who have just received yet another “we regret to inform you” message. The senior guys, who appear so successful, have had their fair share of polite “thanks, but no thanks” as well. Virtually everything in science is competitive: getting permission to start a study, obtaining valid results, publishing those results, presenting them at conferences, securing funding for follow-up research, winning travel grants or personal awards. And where there is competition, there is rejection. Lots of it.

A medical ethics committee may take well over a year before approving a study. Once underway, studies sometimes run aground. Studies that are successfully completed often fail to confirm the original hypothesis. Scientific journals that reach a broad audience openly state on their websites that they can publish only around five percent of the manuscripts entrusted to them. And if your study produced a negative result, brace yourself for a rejection count that may well reach double digits,

because the “top journals” are not particularly fond of null findings. Such emails along the lines of “...although this decision does not necessarily reflect the quality of your work, we regret to inform you that we have decided...” is disappointing every single time. Funding agencies such as NWO, the European Union, and many others typically receive anywhere from ten to a hundred times more applications than they can support. After spending weeks—sometimes months—crafting what you believe is an excellent proposal, you receive a courteous but unequivocal rejection. In everyday scientific life, rejection is the rule; success is the rare exception. That inevitably takes its toll.

At moments like these, it helps enormously to have a good research team around you—a group with whom you can grumble, vent your frustration, and, eventually, laugh again. Sharing stories of setbacks helps. As this year's Stevin prize winner, I suppose I should lead by example. Learning to cope with rejection without losing faith in your own work may well be one of the most valuable lessons experienced scientists can pass on to their younger colleagues. In many ways, it is no different from parents teaching their children to process not being invited to a classmate's birthday party, or not having progressed to the next class. Anger, disappointment, disbelief—they are all perfectly appropriate, just not for too long. After a (preferably short) period of feeling sorry for yourself, it is time to gather courage, improve your work, and submit an even better version for review, publication, or funding. Critical reviewers almost always

teach you something, preparing you better for the next time around. In the end, you only need to submit one more time than the number of rejections you receive. That persistence—the ability to get back up after yet another digital door was slammed in your face—is the true key to success in science. Because rejection is our daily bread; success remains the rare exception. And when success does come, it deserves to be celebrated. I therefore wish Karin Roelofs, Hermen Overkleeft, Claes de Vreese, and their teams a wonderful celebration. Here in Groningen, too, the flags are flying. Hooray!

● BY IRIS SOMMER

● PHOTO BY MARJORY HARINGA

BCN PHD COUNCIL NEWS



Tour de Grunn

On the bright and sunny morning of the 30th of May, the full BCN peloton departed for the first (and final) stage of the inaugural Tour de Grunn. After a neutralized rollout from the UMCG to the Stadspark, the race exploded at the tête de la course, as the riders entered the fearsome mountain ranges of the Les Ommelandes, reaching dizzying heights of up to 2200mm above sea level. Fueled by scientifically enhanced BCN-sports-gels, a select breakaway group launched a daring late attack at the Grand Lac Paterswoldais. After carefully reviewing the photo finish, the commissaires awarded the stage win to all riders (making the winner's jersey very much undersized).

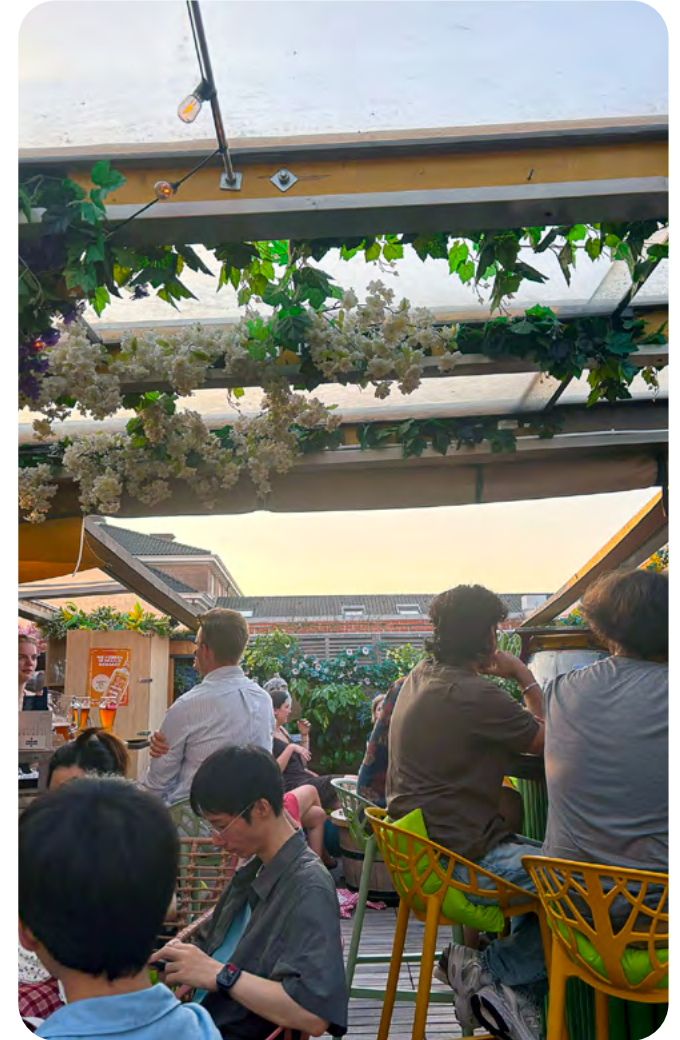
InDesign

Your Dissertation Workshop

Ever wondered why some theses look so polished before you even read a single word? We recently had the chance to find out during another fun and practical design workshop with Lisa, a professional thesis designer. She shared plenty of tips and tricks on creating a clean, eye-catching thesis layout—from choosing fonts and organizing titles to placing text and making pages easy to navigate. The session was packed with useful advice, practical examples, and lots of questions from an engaged audience. Whether just starting to write or already polishing the final draft, everyone walked away with ideas to make their thesis look as good as the science inside.

BCN Summer Drinks

We wrapped up June with a lovely evening of drinks at the Happy Traveler rooftop. It was the perfect opportunity to take a break from experiments, deadlines, and data analysis, and simply enjoy each other's company. Over drinks and snacks, we shared stories about our PhDs, talked about the much-needed holidays many of us were looking forward to, and got to know fellow BCN PhDs a little better outside the lab. Thank you to everyone who joined us—we hope you had a great time, and we look forward to seeing you at the next BCN PhD Council event!



● BY SÖNKE STEFFEN AND LIA POZANTZI
● PHOTOS BY SASKIA GOOIJER

INTERVIEW

Fitness to drive, social cognition and young-onset dementia

An interview with Rients Huitema and Floor Gelmers

Driving is a complex activity: in addition to controlling the vehicle (accelerating, braking, steering, and changing gears), driving also requires traffic insight, knowledge of traffic rules, risk assessment, and the ability to anticipate, amongst others. A driver must not only be skilled—able to operate a vehicle and understand the rules—but also be mentally and physically capable of driving, or ‘fit to drive’. Fitness to drive is particularly at risk in patients with neurological conditions and associated cognitive impairments. In some cases, patients may still be able to drive safely for a period of time, but in other cases—especially with

progressive conditions—it is safer to quit driving. A comprehensive fitness to drive assessment, conducted exclusively at the UMCG, investigates this in detail. Moreover, scientific research is being carried out into fitness to drive and cognition, with a particular focus on young-onset dementia and social cognition.

Together with dr. Rients Huitema, clinical neuropsychologist, and Floor Gelmers, MSc, neuropsychologist and PhD student, we delve into the importance of fitness to drive assessments, the role of (social) cognition, and young-onset dementia.



The UMCG is the only university medical centre in the Netherlands that conducts fitness to drive assessments. How did this come about?

RIENTS HUITEMA: This originated with the work of Wiebo Brouwer, who was professor of Traffic Medicine and Neuropsychology at the UMCG. This chair emerged from Verkeerskundig Studiecentrum (VSC), which was located in Groningen as part of the University of Groningen. The VSC researched human functioning in traffic. Brouwer worked closely with the Centraal Bureau Rijvaardigheidsbewijzen (CBR), and simulator-based research was initiated in collaboration with Stichting Wetenschappelijk Onderzoek Verkeersveiligheid (SWOV). At that time, legislation stated that for certain medical conditions and types of medication, an assessment using a driving simulator was required. This applied, for example, to the use of category III antidepressants, which can

In the YOD-RiSoCo project, we study driving behaviour and traffic-related risk-taking in people with young-onset dementia (YOD).

potentially have a serious impact on driving ability. In principle, individuals using such medication are considered unfit to drive motor vehicles, although there are exceptions.

Individuals were required to complete a vigilance drive in the driving simulator: a 20-minute drive on a road where nothing happens. Nowadays, the driving simulator is no longer explicitly specified in legislation (for the interested reader: <https://wetten.overheid.nl/BWBR0011362>), but the fitness to drive assessment remains included. The collaboration with the CBR has continued, and the driving simulator is still used as part of an extensive, standardized assessment protocol. For example, when individuals appeal a CBR decision, the CBR may refer them to the UMCG for a comprehensive neuropsychological and fitness to drive assessment, which includes a simulator drive.

Why are both a simulator drive and a neuropsychological assessment included in a fitness to drive assessment?

RIENTS HUITEMA: We always start with an extensive neuropsychological assessment. We do not necessarily use the 'standard' tests; instead, we assess cognitive functions that are crucial for driving, ranging from visual perception and attention to hazard perception. However, if we identify cognitive impairments, this does not automatically mean that a person is no longer able to drive. The driving simulator is an excellent observational tool in this respect, as it places high demands on visual perception and motor skills, allowing us to see whether individuals are able to compensate for their impairments; by driving slower, maintaining greater distance, and braking in time, for instance. In addition, you can make sure that someone encounters multiple traffic situations in a driving simulator; during an on-road driving test, you cannot control the traffic situations someone encounters.

When someone has a medical condition, a health declaration needs to be submitted to the CBR. Why is behaviour not explicitly assessed in this health declaration?

RIENTS HUITEMA: If someone, for example, has dementia, submitting a health declaration to the CBR is followed by a medical assessment, which results in a specialist report. If the patient has dementia with (possible) behavioural changes, proxy history taking is mandatory. This is the only behavioural aspect that is formally assessed. And even though you want to observe behaviour in an on-road driving test, the situations that elicit specific behaviours do not always occur. Moreover, a patient's behavioural impairments are usually evident if a patient is in an advanced stage of the disease. Yet, patients in early stages are often better able to maintain appropriate behaviour for the 45-minute duration of the test.

How is risky behaviour assessed in the fitness to drive assessment?

RIENTS HUITEMA: Until recently, risky behaviour was assessed in more complex simulator scenarios, but we did not have a scenario specifically designed for this purpose. Social cognition was still a relatively new concept. Aspects of risky behaviour were also indirectly captured in hazard perception, which comprises the assessment of static traffic situations from the driver's perspective. In such situations, a person must decide whether to release the accelerator, brake, or to take no action. This is also related to the level of risk a person is willing to take. In collaboration with the University of Groningen and with input from practical experts in fitness to drive assessment at the CBR, we developed a new driving scenario—the RiTT—specifically designed to assess risky behaviour. This

The driving simulator is an excellent observational tool, as it places high demands on visual perception and motor skills, allowing us to see whether individuals are able to compensate for their impairments; by driving slower, maintaining greater distance, and braking in time, for instance.

scenario focuses on situations in which individuals may display risky behaviour affecting themselves, others, or both.

Does it happen often that people regain their driving licence following a reassessment after failing the on-road driving test?

RIENTS HUITEMA: In practice, people almost never regain their driving licence directly as a result of the reassessment. When people visit us for a fitness to drive assessment, they usually have previously taken an on-road driving test, failed it, filed an appeal, and were then referred to us. We only provide advice on whether someone is fit to drive; the CBR makes the final decision, for example through a reassessment that may include another on-road driving test. In all these years, there has only been a single instance in which someone was deemed directly fit to drive. In that case, the diagnosis the person had received between failing the on-road driving test and undergoing the fitness to drive assessment was withdrawn, and the individual performed well during the assessment.

How is a person's behaviour in daily life related to their driving behaviour?

RIENTS HUITEMA: This is one of the aspects we aim to investigate: the relationship between social cognition and risk-taking behaviour.

FLOOR GELMERS: In principle, one would expect the behaviour in traffic to correspond more or less to behaviour in everyday life; people are generally not disinhibited in some situations and very disinhibited in others. We do use a questionnaire assessing risk-taking behaviour, and this does appear to be related to performance in the driving simulator.

RIENTS HUITEMA: Yet, it could be that people are somewhat more disinhibited when driving than in daily life. Over time, certain behaviours have developed that make driving safer, but also behaviours that make driving less safe slip in—and there are considerable individual differences in this respect.

FLOOR GELMERS: Even among the healthy control participants in our research, we observe differences in the extent to which people take risks, although these differences are not extreme.

RIENTS HUITEMA: Disinhibited behaviour in traffic may arise because people start to behave more dangerously, but it can also result from a lack of compensation for limitations because of reduced insight into their illness. For example, people with Parkinson's disease have motor impairments, but if they have insight into these

limitations, they can often drive safely; by taking medication when they feel off and only driving again after feeling better. That is very appropriate behaviour. We all have factors that sometimes impair our driving, and being aware of them and acting upon them is essential. But this is challenging, or even impossible, when there is reduced disease insight due to cognitive impairments.

In collaboration with the University of Groningen and with input from practical experts in fitness to drive assessment at the CBR, we developed a new driving scenario – the RiTT – specifically designed to assess risky behaviour.

FLOOR GELMERS: I have seen cases in the driving simulator where someone had difficulty placing their foot correctly on the accelerator and brake pedals, but did not adjust their behaviour to account for this, for instance by releasing the accelerator earlier.

People with young-onset dementia also participate in scientific research as part of your PhD project, YOD-RiSoCo, right, Floor? Could you tell us more about that?

FLOOR GELMERS: In the YOD-RiSoCo project, we study driving behaviour and traffic-related risk-taking in people with young-onset dementia (YOD). This is a group that often still has a driving licence and typically has driven extensively. Investigating risk-taking behaviour is therefore crucial, particular in this group. As Rients mentioned



earlier, we developed a risk-focused simulator scenario called the RiTT. This allows us to examine how patients with different types of YOD—and with and without behavioural changes—perform in such a drive and to determine in which types of YOD risk-taking behaviour is most prominent. In addition, we examine the relationship with impairments in social cognition, i.e., the cognitive processes that enable us to process social information and to navigate the social world. We expect these aspects to be related. If we ultimately find a strong association between social cognition and performance on the RiTT, this could have implications for the fitness to drive assessment procedure. For example, it might reduce the need for additional on-road driving tests, allowing more conclusions about fitness to drive to be drawn from the neuropsychological assessment alone. Furthermore, if certain groups with specific cognitive impairments or a particular diagnosis consistently perform poorly in fitness to drive assessments, we may need to consider whether different regulations should apply to certain groups.

RIENTS HUITEMA: It may then become necessary to incorporate into legislation that individuals with certain types of YOD should no longer be allowed to drive at all. Alternatively, if impairments in social cognition prove to be predictive, people with socio-cognitive impairments may no longer be permitted to drive at all. This would reduce the need to offer additional on-road driving tests – especially given that the capacity for such testing is limited. This is particularly relevant because many patients wish to continue driving, especially those with limited insight into their condition.

FLOOR GELMERS: The unclear boundary we currently have also creates tension. There are patients who want to continue driving, while their partners would prefer them not to.

What do you expect about the relationship between social cognition and risky driving behaviour?

FLOOR GELMERS: We examine whether people are able to experience emotions. Fear, in particular, is an important factor in driving, as it has a warning function in situations of danger: if someone experiences less fear, they are more likely to take risks. We also investigate whether individuals are able to take another person's perspective. If someone is unable to do so and takes risks that also have

consequences for others, it is conceivable that they will be more inclined to take such risks. However, all of this needs to be evaluated based on empirical research.

What are examples of traffic violations or notable situations that you often observe in the driving simulator?

FLOOR GELMERS: In my research, participants take part voluntarily and are not referred by the CBR. This means they cannot lose their driving licence by participating in the study, even if they commit traffic violations during the simulator drive. What I often see going wrong is that people take right of way when they do not actually have it and fail to anticipate that another road user may assume priority instead. Anticipation is, of course, a crucial aspect of safe driving. What also stands out are the verbal reactions in the driving simulator. Some people are very quiet and say nothing throughout the entire drive. Others talk a great deal and provide running commentary, such as: “I have the right of way” or “Can that bus hurry up?” There are also individuals who react very strongly to situations; we have had participants who started swearing.

RIENTS HUITEMA: You also sometimes hear from partners: “He still drives safely, but he swears at everyone.”

FLOOR GELMERS: That swearing can be directed at other road users in the simulation, at oneself, or even at the simulator itself—for example, complaining that the simulator does not brake properly, brakes too hard, or feels different to their daily experience. However, we always conduct practice runs beforehand, so participants do become well accustomed to the simulator. Despite some grumbling, most people actually find the experience very enjoyable. So far, it has almost never happened that someone says they never want to drive in the simulator again.

- WRITTEN BY MARIE-CHRISTINE VAN DE GLIND
- PHOTOS BY ZHENYU ZHANG AND MARIE-CHRISTINE VAN DE GLIND

GRAND STUFF

Rubicon Grant for Anika Poppe

Title: **SelfBoost: The Future of Home-Based Mental Health Support**

Over 100,000 people in the Netherlands face long waiting times for mental health care. SelfBoost tests a new approach: a smartphone app that strengthens confidence in handling challenges, combined with exercise or gentle brain stimulation at home. In 200 stressed students, I will explore how these tools can support wellbeing and prepare for treatment.

Alejandro Marmolejo Garza wins BCN Dissertation Award

During his PhD project, Alejandro Marmolejo Garza investigated cellular mechanisms contributing to neurodegeneration. He combined patient-derived iPSC models (iPSC-differentiated microglia, brain organoids) functional mitochondrial assays with bioinformatic analysis to understand how specific cellular pathways could contribute to neuronal vulnerability, particularly in Alzheimer's disease models. This combination demonstrates not only exceptional technical versatility but also a rare ability to integrate wet-lab experiments with advanced bioinformatics. A central achievement of his work is the elucidation of mitochondrial and metabolic mechanisms that drive cellular vulnerability in Alzheimer's disease, including mitochondrial calcium dysregulation, ferroptotic pathways, and species-specific metabolic reprogramming. These integrated approaches allowed him to link molecular changes to functional phenotypes,

providing both molecular insights and translational value to his findings.

Alejandro has a solid publication record, his work being documented in ten papers/reviews, published in a wide range of journals (including Cell Death and Disease, Cell Calcium and Nature Communications), of which five as a first author. During his PhD trajectory, Alejandro showed great enthusiasm, creativity, independence, technical versatility and also scientific maturity. His multidimensional approach aligns seamlessly with the interdisciplinary mission of BCN, where molecular neuroscience, cellular behavior, and cognition meet. Alejandro's dissertation exemplifies the innovative and integrative neuroscience that BCN aims to foster, making him a highly deserving recipient of the BCN Dissertation Award.

His excellent work was performed in the lab of Prof. Amalia Dolga (FSE) and Prof. Erik Boddeke (UMCG).



Jente Zeubring wins poster prize at NWO Life 2026

At NWO life 2026, Jente Zeubring won the 2nd prize for the best poster of the meeting. Given to her by Auke-Florian Hiemstra. The jury praises her for her enthusiasm and for her creative research arising from serendipity.

Stevin Prize for Iris Sommer

Iris Sommer will receive the 2026 NWO Stevin Prize, the highest honour for researchers in the Netherlands who have achieved exceptional results in translating knowledge into societal impact. Sommer will receive €1.5 million, to be spent on scientific research and initiatives relating to knowledge utilization. Sommer is a professor of Psychiatry at the UMCG and the UG.

<https://www.rug.nl/about-ug/profile/prizes-and-awards/stevin/iris-sommer/>

SCIENCE ON WEDNESDAY

If BCN neuroscience was captured in art, what would it look like? For Science on Wednesday, students of Art Academy Minerva created artwork about neuroscientific findings from BCN researchers. This project was made possible by Marie-José van Tol, Robert Schoevers, Iris Sommer, Franciska de Beer, Sander Martens, Dagmar den Boer, Misia Prycka, Marjolein Viersen, Jort Noorman, Mae Tol, and Mary-Ann van der Linden. Here we display two facts and accompanying artworks.

Are you interested in seeing more artwork?

Every Wednesday, you will find a brain fact with artwork on the Science on Wednesday social media pages [<https://linktr.ee/>

● BY SCIENCE ON WEDNESDAY TEAM



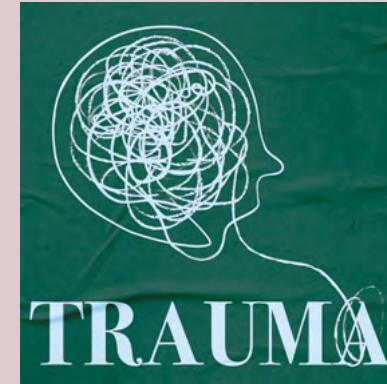
People who feel lonely are more likely to experience hallucinations involving other people. For example, they might feel a hand on their shoulder or hear people talking.

In a large sample of adolescents, loneliness was associated with an increase in 'social hallucinations', such as hearing voices or laughter and feeling touch. One theory that attempts to explain why some individuals are prone to developing psychotic experiences during adolescence suggests that social withdrawal during this critical period of 'social brain' development triggers the activation of 'social schemas' in the brain, leading to social hallucinations.

Artist: **Ioana Corina Velea**

Researcher: **Dr. Sanne Brederoo**

Reference: Brederoo, S. G., De Boer, J. N., Linszen, M. M. J., Blom, R. E., Begemann, M. J. H., & Sommer, I. E. C. (2023). Social Deafferentation and the Relation Between Loneliness and Hallucinations. *Schizophrenia Bulletin*, 49(Supplement_1), S25-S32. <https://doi.org/10.1093/schbul/sbac064>



Traumatic experiences during childhood may shrink your brain

Traumatic experiences during childhood, such as physical abuse or emotional neglect, increase the risk of mental health problems. This may be due to trauma changing the structure of brain regions that are sensitive to stress. Brain imaging research shows that people with childhood trauma and psychiatric disorders have reduced volume in the front part of the brain, known as the frontal areas. This could explain why a traumatic childhood is often linked to emotional and cognitive difficulties.

Artist: **Na Young Lee**

Researcher: **Dr. Marieke Begemann**

Reference: Begemann, M. J. H., Schulte, M. J. L., Van Dellen, E., Abramovic, L., Boks, M. P., Van Haren, N. E. M., Mandl, R. C. W., Vinkers, C. H., Bohlken, M. M., & Sommer, I. E. C. (2023). Childhood trauma is associated with reduced frontal gray matter volume: A large transdiagnostic structural MRI study. *Psychological Medicine*, 53(3), 741-749. <https://doi.org/10.1017/S0033291721002087>

REMA COLUMN



A Semester in Sydney

When I accepted a thesis and internship project in Australia last year, I expected great research, sunshine, and life-threatening wildlife encounters... But was it really like that? Here I will try to describe my experience from the past 6 months and see how closely it matched these expectations.

My placement was at the Black Dog Institute (BDI), a medical and mental-health research organization in Sydney. Besides research, they also have a mental health practice, and there they run pretty much anything from psychotherapy to transcranial magnetic stimulation (TMS) and psychedelic trials. They also work on policy-making and on community projects such as social programs for First Nations communities.

My project was with the Child Mental Health team, currently focused on a clinical trial targeting anxiety disorders in children through Cognitive Behavioral Therapy, delivered in an in-person/online hybrid. Something really cool about this project is that I had the chance to do both research and clinical work directly with patients. To be honest, I never thought I would

work with children in a project like this, so at first I doubted whether this was going to be something for me; however, the opportunity was a little too good to let it pass. In retrospect, going there with an open mind really paid off, as I now believe working with children is incredibly rewarding because it allows you to intervene at a developmental stage where you can have a truly lasting impact on a person's life.

In retrospect, going there with an open mind really paid off, as I now believe working with children is incredibly rewarding because it allows you to intervene at a developmental stage where you can have a truly lasting impact on a person's life.

My role involved multiple tasks; some days I was writing clinical reports, others I was working more with data or having interviews with participants. At times, follow-up calls with patients with more complex cases were necessary. Dealing directly with cases like this was scary at first; however, the training and supervision I

received were superb and well structured, so I never felt like I was being fed to the lions.

In parallel, I was conducting my thesis research, though not with the same participants. My thesis was instead based on the PADDY project, a collaboration between the RUG and Black Dog that is compiling the world's largest individual-participant dataset on child anxiety by pooling data from Cognitive Behavioural Therapy (CBT) studies conducted around the world. Thanks to PADDY, we will be able to conduct high-power analyses and moderator/predictor analyses that were never possible before, by doing Individual-Participant Meta-Analyses. The aim is to move beyond the question of whether CBT works and instead identify why it works, for whom it is effective, and under which conditions it achieves the best outcomes.. This is more useful than having more general aggregate data like in traditional meta-analyses.

When it comes to living there, Australia is somehow both similar and quite different from the Netherlands. On the one hand, both have this amazing thing where there is much openness and little distance between students and people in more senior positions. My supervisor was very kind, approachable, and involved with my work. She even let us use her car for a week to go to her family's summer house!



At the same time, life in Sydney moves at a different pace than Groningen. The city is of course much, much bigger and more spread out, so I will never again take for granted the possibility of cycling 5-10 minutes to any destination in Groningen, something I kept reminding myself during my 2h/day commutes to the institute in Sydney.

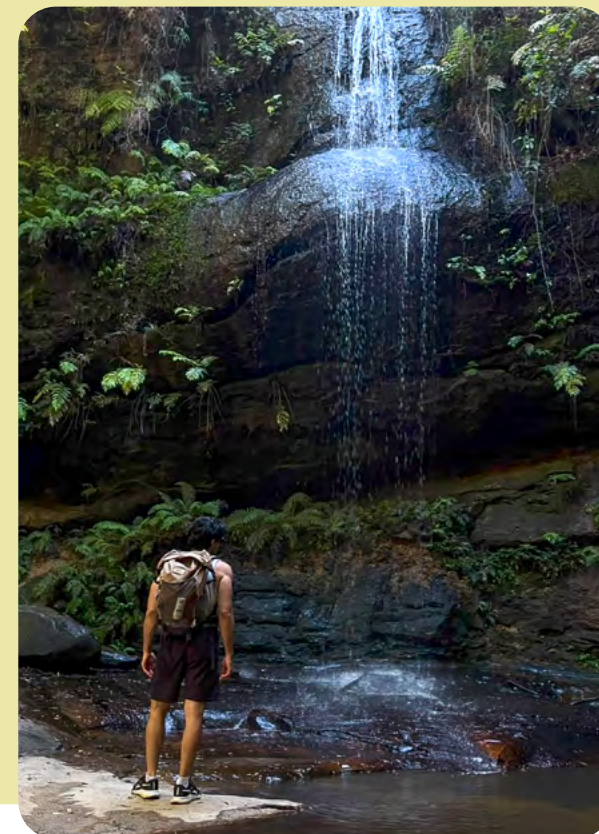
That said, though expensive, Sydney is truly an amazing place. It has kind weather, clean air, top-notch public transport and infrastructure, and an early lifestyle where people will be at the beach and on their second coffee by 6 am before heading to work. Days are long in summer and autumn, and nature is just one step away with many parks and forests inside or near the city. One of the best weekends of my life I spent at the Blue Mountains, just 2 hours by train from Sydney, with stunning hikes, forests, and wildlife, including magical glow-worm caves!

And how about spiders, you ask? Well... yes, they are there, but if you learn to ignore the casual funnel web spider (the most poisonous spider in the world) by your bedroom window, or if you can handle a few huntsman infestations here and there, then you'll be fine. On a related note, if you go surfing, make sure you do so in designated areas which are protected by nets, as I heard of at least five deadly shark attacks in Sydney while I was there.

Toward the end of the placement, a nice surprise came when the institute offered me to continue working together on an internship or PhD next year. However, for non-Australians, the PhD process is quite complicated because it goes through a complex scholarship method, with one window of applications per year. So I am now contemplating whether I'd really want to return so far from home again. In any case, I am ready to welcome the arrival of the summer, which will hopefully bring the mind space I need to make such decisions.

If you are ever going to Sydney, or are considering a project there, don't hesitate to reach out! I'd be very happy to share information or just have a nice chat over it.

- BY JAVIER GARRIDO JIMENEZ
- PHOTOS BY JAVIER GARRIDO JIMENEZ



BCN PHD COUNCIL NEWS



The BCN Summer Symposium

Even though another grey Monday morning in July gave little hint of summer, it was once again time for the annual BCN Summer Symposium. As is tradition, this event was organised by BCN Research Master students who put together an impressive programme of TED-like talks and poster presentations by fellow students and keynotes lectures by invited speakers. This year's theme, 'Inside Out, Outside In', highlighted the importance of both internal and external factors across the diverse fields of neuroscience represented within the BCN Research School. The symposium spanned two days, with each day dedicated to one side of the theme.



Monday (Inside out)

The symposium was kicked off with an introduction by Ilaria Iele (Summer Symposium Committee), who gave an enthusiastic outlook of what could be expected from the two days ahead: four keynote speakers and an impressive number of poster presentations and talks each day, covering an extraordinary breadth of research topics and methodologies. While not strictly enforced, the Monday was dedicated to how internal mechanisms shape neuroscience research; how processes on the inside influence what we can observe on the out-side.

The TED-style talks by second-year BCN Research Master students reflected this theme well. Topics ranged from senescent microglia and their role in plaque formation in Alzheimer's disease, presented by Marina Ocaña Prieto, who also received the BCN Interdisciplinary Award, to Mihai Oncescu's investigation of uncertainty in EEG-based brain-computer interfaces. Shristi Das received the award for Best Talk for her presentation on cisplatin's impact on cytochrome c and its potential implications for neurotoxicity. Among the many impressive posters, Ilse

Bakker's work on neural responses to mate preferences in female zebra finches was voted Best Poster by fellow students.

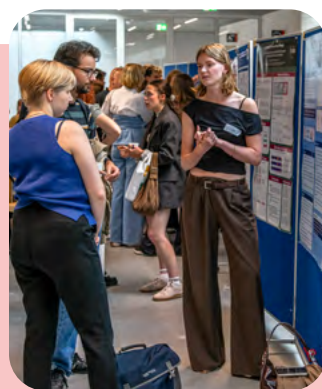
The first keynote of the day was given by Hedderik van Rijn who talked about his memory research and his company, MemoryLab. Well aware that many attendees were already familiar with his research, Hedderik focused on the clinical applications of his ACT-R based fact-learning platform. Together with researchers in Seattle, they invented a tool (SGMA) that can detect mild cognitive impairment without requiring patients to visit a memory clinic, an important advance for people living in rural areas of North America.

Four keynote speakers and an impressive number of poster presentations and talks each day, covering an extraordinary breadth of research topics and methodologies.

The second keynote of the day was given by Marina Trombetta Lima, who discussed her research on ageing. More specifically, she talked about how cellular mechanisms on the inside and microenvironmental processes on the outside influence ageing in brain-organoids; not only on Earth, but also up in space! Taking the audience on a journey to the International Space Station, Marina explained how the effects of spaceflight on cellular ageing are studied and how these findings can be replicated and manipulated back in Groningen.

Tuesday (Outside in)

The second day also opened with an introduction from the organising committee, this time focusing on how external influences shape the inner workings of the nervous system. Just like on Monday, the posters and talks were on a broad range of topics. Kris Vasse's talk about her research on learning behaviours of wild vervet monkeys, and Merlijn Brouwer's visually impressive poster about working memory research using non-invasive brain stimulation were crowned as the highlights



of their respective category. Alongside these student presentations, two keynote speakers offered further insights into their research.

The first keynote was presented by Paul Lucassen from the University of Amsterdam. His research nicely tied in with the theme of the day: how does the brain change in response to stimuli from the outside? By being plastic, of course. Paul was quick to clarify that his research was not about microplastics in the brain, but mechanisms of learning and adaptation inside the central nervous system. He explored different kinds of

Taking the audience on a journey to the International Space Station, Marina explained how the effects of spaceflight on cellular ageing are studied and how these findings can be replicated and manipulated back in Groningen.

plasticity and shed light on an important paradigm change that gained more traction over the past decades: neurogenesis also happens in adult mammals including humans, and it has functional implications.

The final keynote of both the day and the symposium was delivered by Mauro Cavarro from Maastricht University, who investigates altered states of consciousness and their use in psychotherapy. His captivating talk centred around improving clinical outcomes of therapy by creating windows of flexibility. Classically, these windows can be opened by administering psychedelics (as part of a carefully designed therapy pipeline) but new research suggests that a similar (or perhaps even the same) window can be opened by using breathwork techniques, specifically high ventilation breathwork which can produce physiological and psychological responses similar to the ones seen in psychedelics. Before concluding the symposium, Wouter Kruijne was presented with the Best Practice Award by the BCN Student Council for his extraordinary commitment to teaching. As a final remark, Robbert Havekes

highlighted the work of the Summer Symposium Committee, consisting of Marysia Michalak, Paula Gómez Méndez, Lene de Jong, Ilaria Iele and Marta Prati, whose hard work made another outstanding edition of the Summer Symposium possible.

- BY JAN BETHE
- PHOTOS BY ZHENYU ZHANG AND MERLIJN BROUWER



CHEEKY PROPOSITIONS

The data of your thoughtfully conceived, rigorously planned, and carefully designed experiment may sometimes mercilessly dismantle your beliefs. But this is the paradoxical beauty of science: You can be absolutely delighted when you realize that you could be proven wrong.

IRENE MOGNON

All experiments are artificial, but some are useful (freely inspired by George Box).

IRENE MOGNON

The biggest illusion about transferring and processing MRI data is that the process is standardized and reliable and that it will actually work out the first time.

JUSTYNA KLOS

The path to scientific success does not have to be paved solely with work.

SARAH TOL

Personal and professional growth happens where results are not the only guide.

SARAH TOL

But at least no one can say we haven't grown. – Ben Platt

SARAH TOL

You can't go back and change the beginning, but you can start where you are and change the ending. – C. S. Lewis

SARAH TOL

From the apparent chaos of intrinsic disorder emerges an unexpected level of organization.

TESSA BERGSMA

The hidden value of education lies in the networks one builds with knowledgeable people.

MEHRDAD GAZANCHIAN

Science is not finished until it's communicated." – Mark Walport

FRANCISKA DE BEER

De positie van naasten in het mentale gezondheidszorgsysteem verdient meer waardering, zeker gelet op het feit dat zij formeel gepositioneerd worden (dit proefschrift).

SUZANNE KROON

It is your PhD, not others' (workshop "Empower your PhD").

LAN ZHOU

Tempo al tempo (all in good time) (Italian proverb).

NIKKI THÜSS

An unspoken potential advantage of doing a PhD in artificial intelligence is the secret hope that, if AI ever takes over humanity, it will treat you kindly because of your contributions to its existence.

ASHKAN RAHMANI NEJAD

In a world where even intelligence is becoming artificial, we should learn to appreciate the remaining real things around us.

ASHKAN RAHMANI NEJAD

Repurposing FDA-approved drugs, instead of developing new drugs, might offer a translationally accelerated approach to treat cognitive disorders.

CAMILLA PARACIANI



www.phdcomics.com

INAUGURAL LECTURES



● PHOTO BY BOEHRINGER
INGELHEIM PHARMA

INAUGURATION

Prof. H.M. (Hugh) Marston

TITLE

Bringing Precision to Psychiatry: Driving a new era of therapeutic innovation

CHAIR

Precision Psychiatry

FACULTY

Science and Engineering

DATE

March 20, 2026

Mental health is emerging as one of our greatest modern-day challenges. Developing new treatments, however, is proving to be a great challenge. By bringing a new level of precision to our understanding of the patient then it is hoped we can initiate a new era of therapeutic innovation.



● PHOTO BY MARIEKE POEL

INAUGURATION

Prof. E.M.W. (Elisabeth) Kooi

TITLE

Nog lang en gelukkig? Over onzekerheid en hoop in neonatale zorg (Happily Ever After? Navigating Uncertainty and Hope in Neonatal Care)

CHAIR

Neonatology, especially the neonatal care for sustainable health

FACULTY

Medical Sciences

DATE

May 8, 2026

In her inaugural lecture, Prof. Dr. E.M.W. Kooi explores how uncertainty is an inevitable, yet often valuable, aspect of neonatal care. Parents, healthcare professionals, and researchers are confronted daily with complex decisions concerning vulnerable newborn infants. Advances in physiological monitoring, biology and data science are improving our understanding of early-life disease, enabling earlier recognition of complications and more personalized care. As a result, neonatal medicine is increasingly focused not only on survival, but also on sustainable health and quality of life throughout childhood and beyond. At the same time, she emphasizes that technological innovation can only achieve its full value when combined with human connection, collaboration, and hope.

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

MINDWISE



Depression
 Altered sense of smell
 Mood swings
 Loss of interest
 Panic
 Brain fog
 Tinnitus
 Anxiety
 Difficulty concentrating
 Irritability
 Rage
 Hair Loss
 Memory problems
 Hot flushes
 Headaches & migraines
 Heart palpitations
 Poor sleep
 Weight gain
 Dry eyes
 Bloating
 Fatigue
 Flat mood
 Gut problems
 Breast tenderness
 Muscle & joint pain
 Low libido
 UTIs
 Crying spells
 Low energy
 Painful sex
 Low confidence
 Osteoporosis
 Vaginal dryness
 Bloating
 Foot pain
 Feeling dizzy
 New food intolerances
 Heartburn
 Panic attacks
 Word finding difficulty
 Low self worth
 Internal tremors
 Restless legs
 Brittle nails
 Burning mouth
 Dry or itchy skin
 Suicidal thoughts

On brain transformation during perimenopause

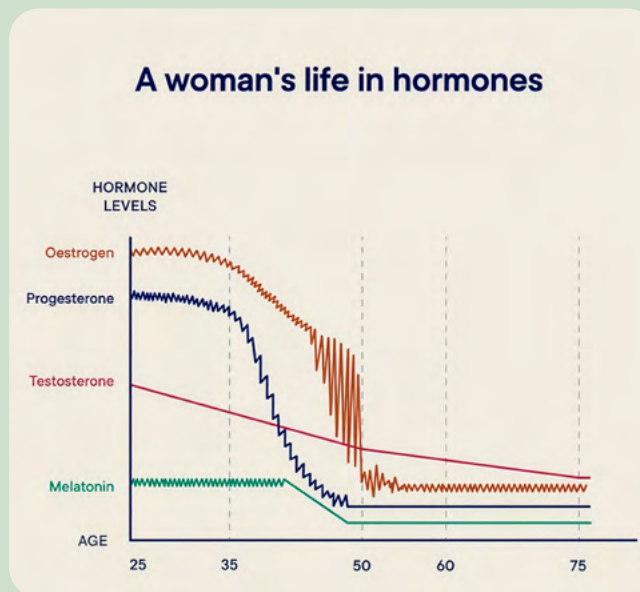
When I unsuspectingly found myself in perimenopause, I thought I had lost my mind! I lost all my energy, suffered from brain fog, grew forgetful, was emotionally all over the place, and experienced intense migraine attacks every few weeks. I no longer recognised myself at all. This intense experience drove me to delve deeper into the menopausal brain; more specifically, into the effects of the perimenopausal transition on the brain. As a neurobiopsychologist, I immersed myself in the work of neuroscientist and nutritionist Professor Lisa Mosconi, who, along with her team in the US, is pioneering neuroscience research in women. She challenges “bikini medicine,” which overlooks fundamental differences in how women’s bodies function by focusing only on the areas covered by a bikini. Neuroscience research on the female brain is still in its infancy, because medicine has long been primarily male-focused, and techniques for studying the female brain are still rapidly evolving.

The featured image of this blog has been reproduced with the permission of Dr. Louise Newson. Source: <https://www.drlouisenewson.co.uk/knowledge/revealed-frequency-and-severity-of-menopause-symptoms>

This blog is based on Mosconi's books and international clinical insights. Writing this has helped me come to terms with the changes in my body. My hope is to foster greater understanding and compassion for women going through the menopause.

On Brain Transformation During the Menopause

From around the age of 35, women's levels of sex hormones—specifically oestrogen and progesterone—begin to decline (Mosconi, 2024 – The Menopause Brain). This is because the supply of eggs in the ovaries, which are largely responsible for oestrogen levels in the female body, starts to diminish. It is well known that a woman's fertility decreases during this period, typically until around the age of 52; this phase is also referred to as perimenopause. Most women have fully reached menopause between the ages of 40 and 58 and are infertile from that point onward. The perimenopausal phase lasts, on average, between 2 and 10 years and varies widely among women, although mothers and daughters within the same family often experience a similar process. It is therefore a misconception that women only begin to experience menopausal symptoms in their fifties. I personally noticed changes before I turned 40—and no, I was not too young for that!

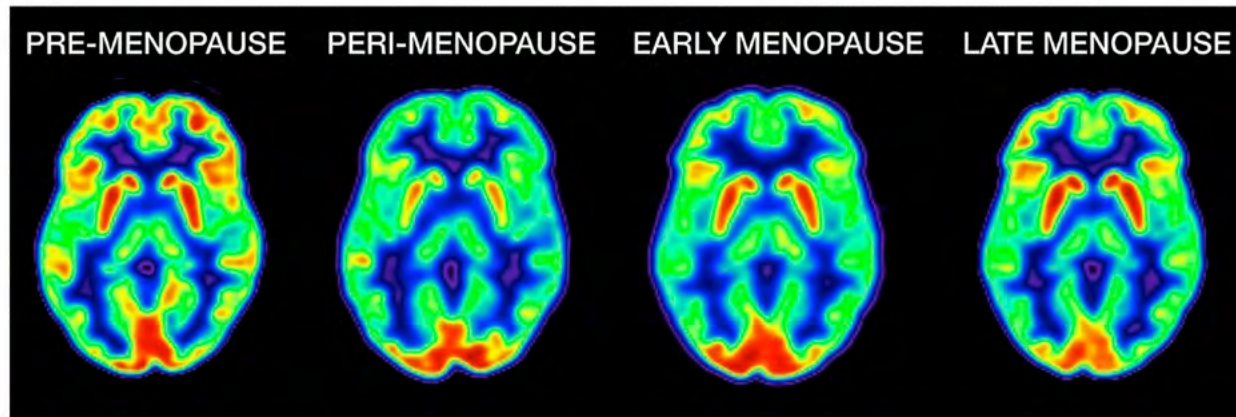


From the average age of 35, female sex hormone levels begin to decline, with significant hormonal fluctuations occurring during perimenopause. The source of this figure is unknown, but its content closely aligns with what Prof. Mosconi describes in “The Menopause Brain”.

During perimenopause, hormone levels fluctuate dramatically—just take a look at the graph above, which illustrates a woman's life in hormones. These fluctuations occur because the feedback loop between various female hormones has gone topsy-turvy as a consequence of the lowered oestrogen levels. The pituitary gland in the brain responds by producing excessive amounts of hormones (FSH and LH) to stimulate the ovaries to

mature the remaining eggs. If successful, this results in a surge of oestrogen and progesterone. But if it fails—and this happens increasingly often towards the end of perimenopause—oestrogen and progesterone levels plummet to new lows. During perimenopause, it seems the female body is doing everything it can to maintain hormonal balance and perhaps achieve one last (final) pregnancy.

During perimenopause, the female brain prepares for a life with very low levels of female sex hormones in the body: a true brain transformation takes place (Mosconi, 2024). The female brain, after all, runs on oestrogen. The brain's energy supply and blood flow depend on the presence of the female sex hormone oestrogen—specifically, the type known as estradiol. Estradiol acts as a helper, facilitating the uptake of glucose into cells, and glucose is the brain's primary fuel. Additionally, female sex hormones keep the heart and blood vessels in our bodies supple. This is, of course, crucial for the brain, which relies on a fine network of small blood vessels and capillaries for its blood supply—and thus for the availability of oxygen and nutrients. Additionally, estradiol plays a key role in neuroprotection (by influencing the immune system and preventing oxidative stress), cell growth, neuroplasticity, communication between cells (by affecting neurotransmitters), and mood (by influencing serotonin). A sudden drop in estradiol levels in the female brain therefore has a major impact on how women feel—they must, in a sense, ‘rehab’ from sex hormones. Research into the nature of brain transformation during perimenopause is still in its infancy. Nevertheless, early,



Brain scans from women 40 to 65 years old show glucose levels dipping during perimenopause and then stabilizing or increasing in some areas postmenopause.

PHOTO: DR. LISA MOSCONI/WEILL CORNELL MEDICINE

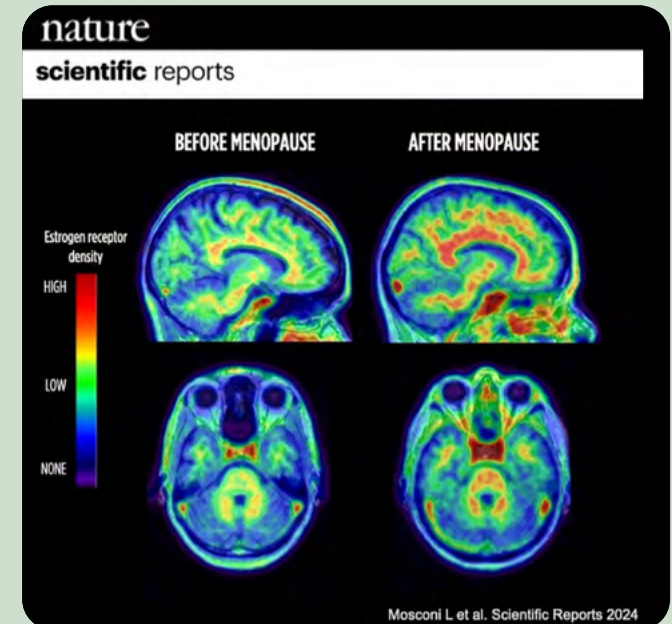
This figure was posted on social media by Prof. Dr. Mosconi's research group and is based on the PloS One publication in 2017.

small-scale neuroscientific studies show that a sharp decline in estradiol levels has a major impact on the female brain. PET research involving a small group of women ($N = 43$) revealed that brain energy dramatically decreases during perimenopause (Mosconi et al., 2017; see the figure above). However, these changes appear to be temporary: in 80% of the women studied, brain energy levels returned to their previous state. In another ground breaking study, Mosconi and her team used a new technique—the F-FES PET scan—to visualise estradiol receptors in the brain for the first time. They found a marked increase in estradiol receptors in postmenopausal women ($n = 18$) compared to women before or during perimenopause ($n = 36$) (Mosconi et al., 2024; see the figure below). The sample sizes in

these studies are small, as PET scans are expensive, invasive, and burdensome for participants. More research of this kind is needed to gain a clearer understanding of the female brain transformation and to bring an end to the era of “bikini medicine.”

Brain Symptoms During the Menopause – The Latest Figures

While it is widely known that perimenopause often comes with physical complaints—such as irregular menstrual cycles, hot flashes, and night sweats—far less attention is given to the common mental symptoms that are a direct



F-FES PET scans of pre- and postmenopausal women's brains, illustrating the density of estradiol receptors before and after the menopause. This figure was shared on social media by Prof. Mosconi's research group and is based on the Nature publication from 2024.

result of the brain transformation described earlier. For some women, this process is relatively smooth, but for others, energy levels during perimenopause fluctuate wildly, from extreme lows to highs—resulting in, as I experienced, a mental rollercoaster! The symptoms associated with these hormonal fluctuations are quite something: the most recent clinical checklist (Newson, 2025) lists a staggering 84 symptoms. This checklist

can be found on the website of Dr. Louise Newson, a women's health specialist who investigated these symptoms in her UK clinic among more than 1,000 perimenopausal and menopausal women. Here are some of the key figures:

1. The most common symptom among women seeking help during the menopause is fatigue or low energy (95%);
2. Next in row are brain fog symptoms, including memory problems (94%), difficulties concentrating (92%), and word-finding difficulties (90%);
3. Following brain fog are mood-related problems, such as irritability (93%), anxiety (92%), mood swings (90%), low motivation (89%), and feeling tense/nervous (88%);
4. Surprisingly, the most well-known menopause symptoms—hot flushes and night sweats—appear much further down the list, though they still affect more than half of the women seeking help: night sweats (62%) and hot flushes (55%).

These figures are based on women seeking support from a clinic, but population-based studies among American women also show these complaints are widespread. A remarkable 60% of women experience brain fog, 50% suffer from sleep problems and fatigue, and 20% experience mood issues or anxiety (Mosconi, 2024). By the way, 85% of perimenopausal women in population-based studies experience hot flushes (which is interestingly more common than in the women who seek help in a clinic as described above), which are actually a brain symptom, since they are

caused by dysregulation of temperature control in the hypothalamus—a brain structure. Women aged 35 and older struggling with hot flushes, fatigue, brain fog, and mood problems are therefore not losing their minds. In fact, according to the figures, it is entirely normal.

Perimenopause as a natural life stage

In many ways, the perimenopause is like puberty—a life stage marked by brain transformation. It is both a time of vulnerability and a time of new opportunities. Just as teenagers are not ill and do not need to be “fixed” or “repaired,” neither are perimenopausal women. For this reason, in the UK, women in this stage are sometimes called “queenagers” (NOON, 2025). Both teenagers and queenagers need space to (re)discover themselves. The mental symptoms a perimenopausal woman experiences can be viewed as signals from the brain that her lifestyle needs to change (Mosconi, 2024). If she continues to push herself with low brain energy as she did before perimenopause, she will burn through all her reserves, making her more vulnerable to burnout, depression, or even psychosis. Rather than assuming she is losing her mind, we could see this as the brain inviting her to adapt her lifestyle and rediscover herself—she will emerge wiser!

● WRITTEN BY YVONNE GROEN

Originally published by [Mindwise](#) on November 7, 2025.

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References marked with * are based on women's personal or clinical experiences during perimenopause. The books by Professor Lisa Mosconi are marked with ** and are highly recommended for further reading.

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**Mosconi, L. (2024). *The menopause brain. The new science empowering women to navigate midlife with knowledge and confidence*. CPI Group (UK)

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*NOON (2025, retrieved on 2025). What is a Queenager. <https://noon.org.uk/what-is-a-queenager/>

BCN THESIS DEFENSES

Implicature processing

PHD STUDENT

I. (Irene) Mognon

PROMOTOR

Prof. dr. P. Hendriks

COPROMOTOR

Dr. S.A. Sprenger

FACULTY

Arts

When we speak, we often communicate, implicitly, much more than what we say literally. For instance, if you ask your friends whether they liked the dinner you prepared, and they reply “Some of your dishes were nice,” you will understand that, most probably, they did not like all the dishes - even though this was not what they literally told you.

Understanding meaning that is not explicitly expressed, as in the example above, requires making an inference (an “implicature”). Is making these implicatures more difficult than sticking to the literal meaning of sentences?

To answer this question, we reasoned that if implicatures are mentally effortful, they could be particularly challenging for children’s developing mind and for non-native speakers. Our results confirmed



● PHOTO BY MIGUEL SANTÍN

this: Both these groups prefer to interpret sentences more literally than adult native speakers do.

We then focused on autism, because autistic individuals are often said to understand language literally. In an experiment, we measured participants’ eye pupils while they made implicatures, because pupils change involuntarily not only with light, but also with mental effort. Interestingly, individuals with fewer autistic traits showed smaller pupils

while making the implicature, indicating that they were making less effort when doing so.

The dissertation shows that implicatures, despite being ubiquitous in everyday language, are mentally effortful, and pupils offer a window into the hidden mental cost of implicit language.

Dissertation

Irene defended her thesis on March 19, 2026.

Magnetic resonance imaging biomarkers for assessment of radiation-induced brain damage in adult patients with lower grade glioma

PHD STUDENT

J. (Justyna) Klos

PROMOTORS

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

FACULTY

Medical Sciences / UMCG

This PhD thesis of Justyna Klos investigates how MRI scans can improve the detection and understanding of brain damage in adults treated with radiation for lower-grade brain tumours (gliomas). As more patients are living longer after such treatment, protecting mental abilities like memory and attention is becoming increasingly important. The research compares several MRI techniques, since brain injury from radiation can show up in different ways, including changes in blood vessels, inflammation, and loss of brain volume.

The findings show that a single MRI method is not able to capture the complexity of radiation-induced brain injury and a combination of imaging



techniques is needed to form a complete picture of when and where damage occurs or progresses. For example, certain MRI methods show small brain bleeds and decline in white matter health, and these changes are not equally distributed. Furthermore, it seems that brain volume changes occur even in the brain hemisphere opposite the tumour. All these changes occur at different timepoints from radiotherapy and only for some the severity corresponds with the volume of radiotherapy dose. Brain bleeds and volume changes, together with the volume of radiation dose seem to be linked to subtle changes in abilities like memory or information processing, but also not in an equal manner.

The thesis concludes that using multiple MRI strategies together allows for earlier and more accurate detection of damage to better help tailor treatments, so patients could maintain quality of life for longer.

[Dissertation](#)

Justyna defended her thesis on April 1, 2026.

Working memory undercover: Searching for traces of synaptic states in neuronal activity across wake and sleep

PHD STUDENT

S.A. (Sophia) Wilhelm

PROMOTORS

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Prof. dr. R. Havekes

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FACULTY

Behavioural and Social Sciences

When you follow directions to a new café or keep track of who said what, you rely on working memory. It holds information for seconds to minutes so we can use it right away. Because it supports daily life, understanding it matters for education, aging and mental health.

For decades, the standard idea was that working memory depends on neurons firing continuously. However, this might not be the whole story. The brain can sometimes go quiet between bursts of activity, yet the memory remains available. This led to the idea of “activity-silent” working memory, where short-lived changes in the strength of connections between neurons temporarily store information—like dimming a phone screen to save battery.

In this thesis I examined these states in humans using EEG during wake and after a daytime nap, and in mice using microscopes during sleep deprivation. First, interruptions disrupted both a prioritised item and a deprioritised item similarly: prioritising improved accuracy, but did not uniquely shield memories from distraction. Second, after the nap, participants with longer sleep spindles showed clearer EEG traces of activity-silent memory, suggesting spindles help prepare the system. Third, in mice, the way animals were kept awake mattered: gentle stimulation decreased neural activity, while novel objects increased it.

Overall, working memory seems to be a team effort—brief bursts supported by short-lived connection changes—with sleep helping tune the team for the next

day. Next steps are to manipulate spindles and align human and animal tasks directly.

[Dissertation](#)

Sophia defended her thesis on April 2, 2026.

Bottom-up skill learning: Computational studies on infant language acquisition and its implications

PHD STUDENT

Y. (Yang) Ji

PROMOTOR

Prof. dr. N.A. Taatgen

COPROMOTOR

Dr. J.C. van Rij-Tange

FACULTY

Science and Engineering

This thesis proposes a unified, domain-general account of early language acquisition using the PRIMs cognitive architecture. While traditional theories are often divided into learning-based and rule-based perspectives, this research suggests that infants seamlessly integrate these processes through bottom-up learning.

Instead of predefined, complex rules, the model uses primitive processing elements that self-organize into processing sequences. Simulations show that the same architecture can produce both lexical and syntactic behaviors depending on the input patterns and processing efficiency.

The thesis moves away from rigid “if-then” rules toward procedural representations. Learning occurs through associations between real-time model contexts and processing elements. Additionally, to bridge the gap between habit and goal-oriented processing, the framework introduces skill elements. These light-weight abstractions allow the model to differentiate task-specific outcomes and adapt to situational changes. The simulation studies predict that infants begin with macro-level processing (continuous encoding) before fine-tuning into specific patterns. It also accounts for preferential looking behaviors by linking gaze duration to the efficiency and complexity of cognitive processing. Finally, the research suggests that cognitive load influences the developmental onsets for different linguistic tasks.

[Dissertation](#)

Yang defended his thesis on April 7, 2026.

Seeing the whole story: Studies on reading training and the measurement of reading in hemianopia

PHD STUDENT

S. (Sarah) Tol

THESIS

Seeing the whole story: Studies on reading training and the measurement of reading in hemianopia

PROMOTORS

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FACULTY

Behavioural and Social Science

For many people, reading is an essential skill in everyday life. It can therefore have a significant impact if one's reading ability suddenly deteriorates. People with homonymous hemianopia (HH) after acquired brain injury can no longer perceive part of their visual field (often half or a quarter). This can lead to reading problems, such as slower reading speed, reading errors and difficulty with text orientation. This doctoral thesis investigates methods for measuring reading and the potential effectiveness of two reading trainings for people with HH. A literature review of training studies for people with HH shows that reading speed is the most common measure. Self-report



● PHOTO BY ANOUK WUBS

measures are less frequently included in reading training research, and no such measures were found where the quality of the instrument was known. This thesis therefore presents the development and qualities of a new questionnaire for reading complaints after HH: the Hemianopia Reading Questionnaire (HRQ). Further, two reading trainings are described that aim to improve reading in people with HH. In the Vistra training people learn to make different eye movements during reading, and in the (as yet little researched) Rotated Reading training, people learn to read rotated text that falls entirely within their intact

field of vision. The effects were studied with task-performance (reading speed), self-report (HRQ) and interviews. The results demonstrated the potential of the two reading trainings to improve reading skills, as well as the importance of measuring reading at both task-performance and self-reported levels and identifying individual reading difficulties and goals.

[Dissertation](#)

Sarah defended her thesis on April 9, 2026.

Functional and evolutionary aspects of lateralization

PHD STUDENT

N. (Nele) Zickert

PROMOTOR

Prof. dr. A.G.G. Groothuis

COPROMOTOR

Dr. R.H. Geuze

FACULTY

Science and Engineering

This thesis examines functional and evolutionary aspects of brain lateralization and behavioural lateralization.

In order to test hypotheses on why certain cognitive functions are lateralized in the human brain, we measured lateralization of a language task and a spatial orientation task with functional transcranial Doppler in a group of participants while also recording the performance of these tasks. We then tested if strength, direction, and pattern of lateralization were related to task performance.

A subset of these participants underwent a structural MRI scan of their brain. From these images we extracted thickness measurements of the corpus callosum – the white matter structure connecting the hemispheres. We analyzed if corpus

callosum thickness had an influence on lateralization and task performance. Left-handedness in humans is associated with several popular myths and hypotheses, since it persists in a stable minority of about 10% compared to right-handedness. We tested a selection of hypotheses in a large Dutch sample based on an online survey. We tested the relation of hand preference to fitness-related traits like health problems, creativity, aggression, and number of offspring. We furthermore tested the association of the same fitness-related traits with hand skill, based on a test of fine motor skills.

One hypothesis on why humans are largely sharing the same hand preference states, that it might be easier to learn motoric skills from a teacher with the same hand preference. We tested this hypothesis by analyzing the success of replicating a nautical knot from a teacher of the same or opposite handedness.

Dissertation

Nele defended her thesis on April 14, 2026.

Two routes to relief: Outcomes of cervical radiculopathy surgery

PHD STUDENT

N.F. (Nádia) Simões de Souza

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FACULTY

Medical Sciences / UMCG

Cervical radiculopathy is a condition caused by compression of a nerve root in the neck, leading to radiating arm pain, sensory disturbances, and muscle weakness. When conservative treatment fails, surgery may be required. The standard procedure is the anterior approach (ACDF), in which a cervical disc is removed and the vertebrae are fused. An alternative is the posterior approach (PCF), where the nerve is decompressed from the back without fusion.

This thesis, based on the FACET trial, aimed to determine whether the posterior technique is non-inferior to the anterior approach. The findings demonstrate that both techniques yield comparable clinical

outcomes in terms of pain relief and functional recovery at one- and two-year follow-up. Although patients undergoing posterior surgery reported slightly more neck pain in the first postoperative weeks, this difference resolved quickly.

From an economic perspective, the posterior approach was less costly while maintaining equal effectiveness. It also preserves cervical mobility and avoids complications associated with fusion. Work-related outcomes showed that recovery and return to work mainly occur within the first six months, with variability between patients. Factors such as education level and job type influenced recovery trajectories.

A key methodological contribution is the use of a partially randomized patient preference design, which improved participation rates and external validity while maintaining internal validity.

In conclusion, the posterior approach represents a safe, effective, and cost-efficient alternative to the traditional anterior procedure, supporting more patient-centered and efficient care for cervical radiculopathy.

Dissertation

Nádia defended her thesis on April 15, 2026.

Non-canonical coenzyme A biosynthesis

PHD STUDENT

J.J. (Jouke Jan) Wedman

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FACULTY

Medical Sciences / UMCG

Every living cell depends on a molecule called coenzyme A (CoA) to survive. CoA is essential for producing energy and for countless other vital chemical processes. Because cells cannot absorb CoA directly from their environment, they must manufacture it themselves, starting from vitamin B5 (pantothenate). When the genes responsible for this production process are faulty, serious diseases can result, including rare brain conditions (PKAN and CoPAN) and heart muscle disease (cardiomyopathy). Currently, no treatments exist for these disorders. This thesis of Jouke Wedman explores whether cells can acquire CoA through an alternative, “non-canonical” route, bypassing the steps that are blocked by disease. One promising approach involves supplying cells with pantethine, a molecule

that sits further along the CoA production pathway and can circumvent the faulty steps.

Using fruit flies as a disease model, we showed that CoA and its building blocks can be passed from mother to offspring, sustaining early development. We also demonstrated that adding pantethine to the diet significantly extended the survival of flies lacking a key CoA-producing enzyme, but only when certain gut bacteria were present. These bacteria could convert pantethine into 4'-phosphopantetheine, the form the fly's cells could use to continue CoA production. In yeast cells, we identified the first-ever transporter protein capable of importing the CoA precursor (4'-phospho) pantetheine directly into the cell. This discovery opens new possibilities for understanding how cells might be supplied with these molecules therapeutically. Together, these findings lay important groundwork for developing future treatments for CoA-related diseases affecting the brain and heart.

[Dissertation](#)

Jouke Jan defended his thesis on April 20, 2026.

Cognitive interference during driving: A multimethod neurophysiological study of cognitive load

PHD STUDENT

M.L.C. (Moritz) Held

PROMOTORS

Prof. dr. N.A. Taatgen

Prof. dr. J.W. Rieger

Prof. dr. J.P. Borst

FACULTY

Science and Engineering

In his dissertation, Moritz Held investigates how multiple cognitive concepts such as perception, attention, memory, and motor control interact under mental load, using driving as a realistic and safety-critical example. Because driving consists of many subtasks, simple observation of behavior alone is often insufficient to fully explain what happens in the driver's brain. In his research, Held therefore addresses this issue by using a multi-method approach employing computer simulation, behavioural observation, eye-tracking and neuroimaging, in our case measuring the activation of brain areas.

Held uses eye-tracking and pupil dilation as indicators of attention and cognitive load to investigate where drivers are looking and how mentally exhausted they are at that moment. In addition, he simulates the mental processes using computer software to understand the individual components of complex actions, as well as predict future driving actions. Functional Magnetic Resonance Imaging (fMRI) is a method to investigate the brain activation and is used in Held's thesis to measure the activation of certain brain regions in complex driving situations.

The results show that both high and low mental load can impair driving performance. High load leads to competition for limited brain resources, whereas very low load promotes mind-wandering and a lack of focus towards driving, which also degrades performance. Cognitive modeling shows how targeted interventions can mitigate these negative effects, provided the interventions pose minimal additional cognitive demands. In complex scenarios such as left turns at intersections, a clear sequence of brain activation was observed, consistent with theoretical psychological models.

The dissertation suggests that mental load can be monitored and regulated using a combination of computer simulation and brain signals. These findings provide a foundation for adaptive driver-assistance systems that adjust support based on the driver's mental state and are also applicable to other safety-critical domains, including aviation, power-grid control, and human-robot interaction.

[Dissertation](#)

Moritz defended his thesis on April 21, 2026.

Guardians of Disorder: Mechanistic insights into chaperone regulation of FG-nucleoporin phase transitions

PHD STUDENT

T. (Tessa) Bergsma

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FACULTY

Medical Sciences / UMCG

Intrinsically disordered proteins (IDPs) play key roles in cellular organization through their ability to undergo phase separation, yet their aggregation propensity poses a challenge for protein quality control (PQC). The nuclear pore complex (NPC), which regulates the selective transport between the nucleus and cytoplasm, exemplifies this challenge. Its permeability barrier consists of intrinsically disordered phenylalanine-glycine nucleoporins (FG-Nups) that must remain dynamic and functional. Because FG-Nups share biophysical properties with disease-associated IDPs, similar PQC mechanisms likely regulate both physiological and pathological phase behavior. Here, we investigated how molecular chaperones regulate FG-Nups.

Based on biochemical and cell-based assays we demonstrate that the chaperone DNAJB6 directly interacts with FG-Nups, maintains their solubility, and suppresses aggregation in vitro and in cells. This chaperone function is important for NPC assembly during interphase.

We further developed PhaseMetrics, a semi-automated analysis tool to quantify condensate properties in microscopy images. It reliably detects changes in FG-Nup condensates and reveals variability within condensate populations and subtle differences at the level of individual condensates.

Finally, we show that multiple J-domain proteins, including DNAJB6, interact with multiple FG-Nups and delay their aggregation. In DNAJB6, this activity is encoded within a highly conserved intrinsically disordered domain. DNAJB6 forms gel-like structures and we propose that in these chaperone condensates stable homotypic FG-Nup interactions are prevented and dynamic, multivalent heterotypic chaperone:FG-Nup interactions are promoted, preventing unwanted FG-Nup phase transitions. Together, these findings in this thesis of Tessa Bergsma demonstrate that molecular chaperones not only

support protein folding but also regulate physiological phase behavior, safeguarding IDP integrity and NPC function.

[Dissertation](#)

Tessa defended her thesis on April 29, 2026.



● PHOTO BY LOTTE BERGSMA



● PHOTO BY NASIM SHAFIABADI

Glaucoma and functional vision: Linking visual field loss to visual perception and quality of life

PHD STUDENT

M. (Mehrdad) Gazanchian

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FACULTY

Medical Sciences / UMCG

In the thesis of Mehrdad Gazanchian was looked at how vision loss from glaucoma affects everyday life. Glaucoma is a common eye disease that slowly damages the optic nerve and leads to permanent vision field loss. The visual field is the part of the environment you can see while fixating on a fixed point.

Doctors have long believed that if one eye has a blind area in its visual field but the other eye can still see it (a so called non-overlapping visual field defect), the brain compensates and daily life is barely affected. Our research shows that this belief is often wrong.

We created a new way to measure this problem, called the Differential Visual Field. Using this method, we found that

people non-overlapping visual field defects often have more difficulty in daily life compared to those without visual field defects. The problems are most noticeable in activities that involve movement and awareness of the surroundings. Examples include walking on uneven ground, crossing streets, and noticing objects coming from the side.

We also tested this in laboratory experiments. Even when vision from both eyes together looks normal, these blind areas reduce basic visual abilities. People become worse at seeing contrast, detecting movement, and recognizing shapes.

To better understand patterns of visual field loss, we analysed a very large dataset and identified 12 common patterns of binocular vision loss (visual field loss present when looking with both eyes simultaneously) in glaucoma. These patterns showed that the location of the visual field loss is important. For example, loss in the lower part of the visual field caused more problems with movement than loss in the upper part.

We then examined the common idea that damage near the centre of vision is worse for quality of life than damage

in the periphery of the visual field. We found that this is not necessarily true. When overall visual field loss and visual sharpness are taken into account, then central damage is not automatically more harmful than other types of damage.

Finally, we studied three dimensional blind areas in front of or behind where a person is looking. We found the for most people with glaucoma, these blind areas do not cause major everyday problems. In summary, this thesis shows that standard eye tests often miss important parts of how people actually see and function in real life. To give better and more personal care, doctors need tools that consider differences between the eyes and the pattern of vision loss, not just how much vision is lost overall.

[Dissertation](#)

Mehrdad defended her thesis on April 29, 2026.

Social functioning in psychotic disorders: A multifaceted approach to mechanisms and interventions

PHD STUDENT

I.A. (Ivo) Meins

PROMOTORS

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FACULTY

Medical Sciences / UMCG

For people with psychotic disorders, social functioning, that is, the ability to maintain relationships, work, and participate in society, is often a major challenge. While traditional treatments focus on reducing symptoms such as paranoid ideation, social functioning often lags behind. This thesis explores several factors that could be targeted in therapy to improve social functioning, and how Virtual Reality (VR) can be used to provide better, more personalized support.

The research consists of two main parts. First, it investigates underlying psychological processes, such as social cognition (how we understand others) and the impact of negative symptoms (such as

reduced motivation). Across the studies, reduced drive and motivation stood out as a major obstacle to social participation. Self-confidence also seemed to matter a lot, and communication skills may be a practical place to start in treatment.

The second part focuses on the development and evaluation of VR-SOAP, a modular Virtual Reality treatment. In this therapy, clinicians and clients work together in safe, simulated environments to practise social interactions. The pilot study showed that the treatment was feasible for therapists and well received by patients. While participants reported increased social confidence, actual changes in daily social activities were less clear. The research protocol is described, and the general discussion describes barriers to implementation and lessons learned from conducting the trial in routine care.

Overall, this thesis supports a more personal approach to improving social functioning in psychosis, based on the specific difficulties a person is dealing with.

Dissertation

Ivo defended his thesis on April 30, 2026.



● PHOTO BY CASPER MAAS

To continue or not to continue?: How to optimise antipsychotic treatment for first-episode psychosis and personalise psychiatric care for women

PHD STUDENT

F. (Franciska) de Beer

PROMOTOR

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FACULTY

Medical Sciences / UMCG

Nearly half of all people in the Netherlands will experience a psychiatric disorder at some point in their lives. So how can we ensure that treatment truly fits the unique person?

This dissertation of Franciska de Beer shows that mental disorders develop differently in women than in men. Women have different vulnerable periods, such as around their thirties and in their fifties. Hormonal phases, including the menopausal transition, also play a major role. They influence not only when symptoms arise, but also how well medications such as antidepressants and antipsychotics work.

Yet there are no female-specific clinical guidelines for these medications. As a result, women often receive the same dose as men. This dissertation shows that women have higher blood levels of many antidepressants and several antipsychotics. This can make the medication more effective, but also increases the likelihood of side effects. During menopause, blood levels change again, raising the risk of relapse into depression or psychosis. For people recovering from a first episode of psychosis, it is often assumed that all antipsychotics are roughly equally effective and that finding the right dose is what matters. This research demonstrates otherwise: the type of antipsychotic is also important for recovery. Drugs that strongly inhibit dopamine increase the risk of relapse, whereas medications that inhibit the dopamine system more mildly are linked to fewer problems with cognition, emotions, and daily functioning. Findings from the world's largest antipsychotic tapering study show that tapering earlier has short-term risks, but may lead to better functioning in the long run.

[Dissertation](#)

Franciska defended her thesis on May 11, 2026.

The complexity of collaboration in mental health systems: a search for views, and experiences

PHD STUDENT

S.J.C. (Suzanne) Kroon

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Dr. J.A.J. van der Krieke

Dr. M.A. Alma

FACULTY

Medical Sciences / UMCG

This thesis of Suzanne Kroon provides insight into perspectives and experiences regarding collaboration between professionals and organisations, and between patients, families and professionals within the therapeutic triangle. This collaboration has been examined from various perspectives (i.e. organisational, mental health and network care) and at national, regional and individual levels. It has examined how collaboration can contribute to the quality of life of people with mental health problems. It thus offers a broad perspective on the subject. Since 2018, care has been shifting from sheltered housing to supported living. This also has implications for social inclusion.



● **PHOTO BY JENNE HOEKSTRA**

Social inclusion faces barriers such as stigma and policy variation. A regional collaboration programme focused on the prevention of mental health problems demonstrates that collaboration does not happen automatically.

Finally, it appears that theory and practice diverge regarding the

involvement of family members in recovery-oriented care, which sometimes leads to complex collaboration between patient, family and professional.

[Dissertation](#)

Suzanne defended her thesis on May 13, 2026.

Beyond the initial impact of aneurysmal subarachnoid hemorrhage: Diagnostic insights into delayed cerebral ischemia following aSAH

PHD STUDENT

J.J. (Joep) van der Harst

PROMOTORS

Prof. dr. J.M.C. van Dijk

Dr. M. Uyttenboogaart

FACULTY

Medical Sciences / UMCG

A ruptured brain aneurysm can cause a brain bleed called an aneurysmal subarachnoid hemorrhage (aSAH). This is a severe stroke that begins suddenly, often with a sudden, severe headache, and may also cause loss of consciousness or paralysis. About one in three patients die, and survivors often face major effects on daily life.

Even after treatment to prevent another bleed, serious complications can develop in the following days to weeks. One of these is reduced blood flow to parts of the brain, leading to insufficient oxygen in brain tissue. This is known as delayed cerebral ischemia (DCI). This can be caused by spasms in the large brain

arteries and problems in the smaller blood vessels. As a result, strokes can occur, often leading to lasting disability. Early detection is therefore crucial.

This thesis of Joep van der Harst examined which methods may help predict DCI at an early stage. It looked at existing techniques such as ultrasound (TCD) and advanced imaging of the brain's blood vessels (CTA). It also investigated a newer method, near-infrared spectroscopy (NIRS), which can measure oxygen levels in the brain. Finally, new scoring methods were developed to describe the severity and extent of DCI in a systematic and consistent way. The results of this thesis show that these scores may improve the prediction of DCI and are therefore promising for monitoring patients after a ruptured brain aneurysm. By combining these data, care can be tailored to the individual patient, with the aim of preventing brain injury at an early stage.

Dissertation

Joep defended his thesis on May 18, 2026.



● PHOTO BY ZHENYU ZHANG

Unraveling traumatic and adverse childhood experiences (TRACES): how are they associated with schizophrenia spectrum disorders?

PHD STUDENT

L. (Lan) Zhou

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FACULTY

Medical Sciences / UMCG

Schizophrenia spectrum disorders are severe mental illnesses that arise from complex interactions between genetic vulnerability and environmental exposures. Childhood adversity (e.g., abuse, neglect, or chronic stress in the family), has consistently been linked to an increased risk of psychosis.

This dissertation of Lan Zhou investigates how traumatic and adverse childhood experiences (TRACES) are associated with the risk, neurobiological correlates, psychosocial mechanisms, and long-term outcomes of psychotic disorders.

A large meta-analysis including more than 349,000 participants showed that individuals exposed to childhood adversity have approximately three times higher odds of developing psychosis compared with those without such experiences. Emotional abuse showed the strongest association.

Using neuroimaging and machine-learning approaches, this thesis further demonstrates that childhood adversity, particularly deprivation (emotional or physical neglect), is associated with signs of accelerated brain aging in adulthood. This finding suggests that early-life stress may have long-lasting biological correlates in the brain.

Psychosocial pathways were examined using network analysis. Results indicate that factors such as low self-esteem, reduced perceived social support, and psychological distress may play key roles in linking childhood adversity with psychotic symptoms and functional difficulties. Longitudinal analyses of individuals with first-episode psychosis further showed that those exposed to multiple forms of childhood trauma tend to experience more severe symptoms, poorer functioning, and lower quality of life over time.

Overall, the findings highlight the importance of early identification of childhood adversity and support the integration of trauma-informed approaches in the prevention and treatment of psychotic disorders.

[Dissertation](#)

Lan defended her thesis on May 20, 2026.



● PHOTO BY SUZANNE BUIKEMA

Interactions beneath the surface: Uncovering the impact of acquired brain injury on cognition and daily functioning in the context of aging

PHD STUDENT

N.S. (Nikki) Thüss

PROMOTORS

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Prof. dr. J.M. Spikman

FACULTY

Medical Sciences / UMCG

Acquired brain injury (ABI), including traumatic brain injury and stroke, is increasingly common due to aging populations and improved survival rates. As a result, more people experience ABI later in life, and more individuals are living into older age with its long-term consequences.

This dissertation of Nikki Thüss provides new insights into the long-term consequences of “ABI in the aged” and individuals “aging with ABI,” highlighting the complex interaction between

cognitive impairments, psychological factors, and participation outcomes.

The findings show that recovery after mild traumatic brain injury in older adults may be slower and less complete than commonly assumed, indicating a particular vulnerability in this group, in which physical frailty and early post-traumatic symptoms play a role and should be recognized early in clinical practice. At the same time, the results challenge the assumption that aging with an acute ABI leads to accelerated cognitive decline. Instead, they suggest that the experienced secondary decline in participation years after injury is more strongly associated with psychological factors, such as emotional wellbeing and resilience, than with demographic or injury-related characteristics. The identification of this post-ABI effect underscores the importance of long-term follow-up and clinical awareness to ensure that ongoing difficulties are recognized and addressed. A life-course perspective is needed, in which care is adapted to both time since injury and stage of aging.

In conclusion, outcomes after acute ABI reflect a complex interplay between cognitive, physical, and psychological

domains, highlighting that recovery is not determined by any single factor but emerges from their interaction.

[Dissertation](#)

Nikki defended her thesis on May 27, 2026.

Virtual nature for mental health: Clinical application and physiological stress markers of virtual reality relaxation for psychiatric problems

PHD STUDENT

L.M. (Lisanne) Robbemon

PROMOTORS

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Prof. dr. M.L. Noordzij

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Dr. C.M.G. van Driel

FACULTY

Medical Sciences / UMCG

Virtual reality (VR) enables people to experience calming, immersive environments that feel real and therefore offers new opportunities for relaxation in mental healthcare. This PhD project of Lisanne Robbemon investigated how virtual nature is perceived to help further

development and how such interventions can be meaningfully assessed.

The first part of the thesis explored the experiences and perspectives of patients and mental healthcare professionals using a VR-based relaxation intervention (VRRelax). The results showed that VRRelax is not experienced in the same way by everyone. How helpful or relaxing VRRelax felt depended on personal preferences, mental health symptoms, earlier experiences with technology, and momentary mood. Both patients and clinicians emphasized that VR works best when it can be personalized and when users receive clear instructions and enough professional support.

The second part of the thesis examined what happens in the body during VR relaxation. Using both laboratory studies and measurements in daily life, we found that common physical stress measures, such as heart rate, do not always match how relaxed people say they feel. Physical stress responses varied strongly between people and situations, and feeling relaxed often occurred without clear changes in the body.

Overall, this research shows that VR relaxation can be a valuable addition to mental healthcare, as long as stress is

seen as a complex and personal process. Successful use of VR requires tailored content, real-world evaluation, and attention to both subjective experience and bodily responses.

[Dissertation](#)

Lisanne defended her thesis on June 3, 2026.

The hidden patterns in visual behavior: Computational models for understanding natural vision and perception

PHD STUDENT

A. (Ashkan) Rahmani Nejad

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Dr. G.A. de Haan

FACULTY

Medical Sciences / UMCG

The Hidden Patterns in Visual Behavior explores how artificial intelligence can advance translational vision science by helping us analyse, restore, and understand human vision in real-world and clinical contexts.



● PHOTO BY STEFAN ANTON

Thesis of Ali Rahmani Nejad develops computational models for three connected domains: eye-movement analysis, prosthetic vision, and visual field loss. First, it introduces methods for automatically classifying gaze events during natural behaviour, where people move freely and use head-mounted eye-trackers. These methods address the limitations of traditional eye-movement algorithms that were mainly designed for controlled laboratory settings. Second, the thesis investigates AI-driven approaches for simulated prosthetic vision, showing how gaze-centred encoding can improve object recognition for future visual implants.

Third, it applies machine-learning tools to identify meaningful patterns of binocular visual field loss in glaucoma and relate them to patients' quality of life. Together, the work shows how AI can uncover hidden structure in visual behaviour and support more natural experiments, better assistive technologies, and more personalised clinical care.

[Dissertation](#)

Ashkan defended his thesis on June 3, 2026.

From stories to strength: recovery narratives in mental health care: Towards a transdiagnostic intervention to promote personal recovery

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In recent years, there has been growing attention in mental health care for personal recovery: the notion that people can lead meaningful and fulfilling lives, even when mental health problems do not fully disappear. Many people report that experiences of others who have gone through similar mental health challenges can support them in their own recovery process. This dissertation examines how recovery narratives can help people with mental health problems. A new intervention was developed with recovery narratives as its core ingredient.

Several focus groups were conducted to co-create a new intervention. Service users, peer support workers and other mental healthcare professionals contributed ideas on what the intervention should look like. In addition, findings of previous international research on key ingredients of recovery narratives—what makes them helpful or unhelpful—were incorporated. Together, this input resulted in offering a digital intervention based on carefully selected recovery narratives in text, audio, and video formats.

The development process is described in multiple articles, guided by intervention mapping methods. Subsequently, the 'STORY MINE' intervention was offered and evaluated in a pilot study to examine its feasibility, acceptability, and potential outcomes. The intervention appeared to be feasible and acceptable. Participants generally experienced the narratives as inspiring and meaningful, suggesting that recovery narratives may be a valuable and accessible addition to existing treatments in mental health care.

[Dissertation](#)

Mitch defended his thesis on June 8, 2026.



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'Lost' to sleep loss: mechanisms and strategies to reverse sleep deprivation-induced amnesia

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Sleep is a conserved biological process essential for physiological homeostasis and cognitive function, particularly memory consolidation. While memory acquisition and retrieval occur during wakefulness, consolidation (the stabilization and integration of newly encoded information) primarily takes place during sleep. Sleep deprivation (SD), increasingly prevalent in modern society, disrupts this process, impairing memory at behavioral, structural, and molecular levels. However,

whether SD leads to permanent memory loss or merely impairs access to stored information remains unclear.

This thesis investigates the effects of SD on memory, memory engrams and their retrievability. In Chapter 2, pharmacological and optogenetic approaches demonstrate that SD-induced amnesia reflects impaired retrieval rather than erasure of memory traces. Restoration of memory performance via engram reactivation or modulation of the cAMP-PKA-CREB signaling pathway indicates that stored information remains accessible under appropriate conditions. Chapter 3 extends this analysis to the whole-brain level, identifying network-level disruptions associated with SD. Functional connectivity analyses reveal key brain regions involved in memory retrieval deficits, while interventions targeting cGMP-PKG signaling with the FDA-approved drug vardenafil successfully rescue memory function. These improvements correlate with restored reactivation of dentate gyrus engram cells, highlighting their central role in memory accessibility.

Finally, Chapter 4 addresses sex differences in sleep and memory, emphasizing the underrepresentation of

female subjects in SD research and the modulatory role of ovarian hormones. Together, these findings suggest that SD primarily disrupts memory retrievability, not storage, and identify potential therapeutic strategies to mitigate its cognitive consequences.

[Dissertation](#)

Camilla defended her thesis on June 8, 2026.

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